



KUWAIT UNIVERSITY

Office of the Vice President for Research

Research Sector

Scientific Poster Day

Sciences Colleges and KISR

March 28, 2016

- *Architecture* • *Computing Sciences & Engineering*
- *Engineering & Petroleum* • *Life Sciences* • *Science*
- *Kuwait Institute for Scientific Research (KISR)*

2015-2016

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Scientific Poster Day for Scientific Faculties & KISR, March 28, 2016

Architecture, Computing Sciences & Engineering, Engineering & Petroleum, Life Sciences, Science, and Kuwait Institute for Scientific Research

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Foreword

The Research Sector (RS) marked eighth season of the annual Scientific Poster Day, involving five sciences colleges, jointly displaying their latest ongoing and accomplished research at the sciences posters day, held at the ground floor lobby of the Presidential building, Khaldiya campus, Kuwait University, on March 28, 2016. Apart from mainstream sciences colleges, the event successfully enlisted the participation of Kuwait Institute for Scientific Research (KISR) for the third successive year in a row, sustaining their interest and involvement as external participants in Kuwait University's scientific posters activity. While RS is endeavoring to enhance the external participants base in this annual sciences activity, the event itself is attracting far wider response from colleges, with a much larger volume of scientific posters appearing on this year's RS display panel. Cumulatively accounting for 98 sciences posters, the display reflected scientific creativity of sciences colleges and KISR's researchers, jointly participating in an organized display of their latest research, with an overall 34.2% (98) increase in posters presentations this year (2016) over last year's (2015) total of 73 posters.

This increase is suggestive of a growing momentum in the domain of scientific research at KU, as well as researchers interest in sharing their scientific accomplishments with a wider community of experts, peers and public attention, and benefitting from interactive discussions and dialogue. RS efforts would remain on further enhancing this promising development, and in encouraging researchers to explore multidisciplinary dimensions in research through comprehensive, joint and collaborative studies.

Already, this development is visible in the displayed posters, as this document provides a progressive outlook of institutional research, with researchers increased predilection towards joint and interdisciplinary studies, involving multi-researchers in coauthoring research outputs, as the posters' credit-lines tend to reveal. This development is integral to RS strategy of encouraging researchers towards interdisciplinary research that require multi-expertise in redressal of scientific complexities in search of practical solutions for strategic national, regional and global concerns. Given this purpose, year 2015-16 Scientific Poster Day went beyond its key objective of scientific display of research activity within KU colleges, by enlisting external participation in the joint pursuit of outstanding concerns that are critical, and potentially significant.

It is largely within this developmental frame that the year 2016 scientific poster day significantly demonstrated the prevailing scientific vibrancy across KU colleges, marking the eighth season of the Scientific Posters Day for sciences colleges. The event, held Under the Patronage of Kuwait University President, Prof. Hussein Al-Ansari, who inaugurated the event, was hosted (and inaugurated) by the Vice President for Research, amidst the attendance of Assistants Vice President for Research, Prof. Yousif Garashi, Dr. Laila Marouf and Prof. Haider Behbehani, and KU's top executives, faculty researchers and key personalities from KISR, enhancing the scientific merit and value of the event.

The event's posters-display involved the participation of colleges of Engineering & Petroleum (24), Science (39), Life Sciences (11), Computing Science & Engineering (10), Architecture (1), and KISR (13), with concerned researchers briefing the viewers on their research objectives and findings, and benefitting from the observations and views expressed. RS believes that such interactions are vital for energizing the institutional research process, and ensuring wide exposure to KU's scientific developments. The annual holding of the Scientific Posters Day event is aimed at achieving this purpose, with the posters event providing an ideal platform towards accomplishing this goal.

The event's organizational activities and critical phases were overseen by Dr. Laila, keenly networking within RS, and across colleges, following progress towards holding of the scheduled events. As per standard procedures, all displayed posters were reviewed by an experts committee, especially constituted for the purpose of shortlisting top ranking posters as winning entries for Posters awards, based on scientific merit and value of the displayed research. The awards, instituted by RS as motivation for researchers towards innovative and distinguished research, are annually granted in three categories -- faculty members, teaching assistants and graduate students.

This document presents an exact replica of the posters displayed at the eighth Scientific Posters Day for the humanities and sciences posters events held on March 21 & 28, 2016, respectively, with the purpose of creating a dynamic and dependable reservoir of scientific information on faculty members research inclinations and interests, and to serve as a vital reference and record on currently researched themes across colleges during the academic year 2015-16.



Scientific Poster Day
for Sciences Faculties & KISR
March 28, 2016
Research Sector

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Architecture





Data Collection and Occupancy Behavior Survey for the Creation and Calibration of UMI model for Al Qadesya

Advisor: Dr. Adil Al-Mumin – Students: AbdulWahab Al Mazeedi – Sheikha Al Ibrahim – Seyed Abbas Al Mohri

Department of Architecture – College of Architecture – Kuwait University

ABSTRACT

New simulation tool was developed, calibrated, and used to analyze the environmental performance of one of the neighborhoods in Kuwait, Al Qadesya. The tool was developed by the Massachusetts Institute of Technology (MIT) and the extensive data of Al Qadesya was collected and investigated by a group of a master degree students from the department of architecture in Kuwait University. The collected data was sufficient to provide acceptable calibrated model ready for a comprehensive energy modeling studies in the urban setting of Kuwait.

1. INTRODUCTION

• UMI stands for Urban Modeling Interface, a software developed by MIT for the architects and urban planners interested in modeling the environmental performance of neighborhoods and cities with respect to operational and embodied energy use, walkability, and daylighting potential.



2. OBJECTIVE

• In order to populate UMI with accurate input data and to insure its calibration, Kuwait University (KU) team and Kuwait Institute for Scientific Research (KISR) team members assisted MIT team and collected wide range and comprehensive sets of data specific to the Kuwaiti environment.

• This data started from the choice of a neighborhood as a case study, to the collection of all related physical and thermal information of the typical buildings stock, to the energy related behavior of their occupants and their scheduling, to the loads of all electrical and mechanical equipments contributing to the energy consumption in a typical residential units.

3. APPROACH

• The accuracy of this project depends heavily on the accuracy of the data provided. This data came mainly from the following government sectors as well as the private sectors:

- (1) The Municipality of Kuwait for the topographic maps and detailed aerial images of Block 8 of Al-Qadesya.
- (2) The Ministry of Electricity and Water (MEW) for the electrical consumption data of all the houses in Al-Qadesya for three years (2012, 2013, 2014).
- (3) The Central Statistical Bureau of Kuwait for the number of occupancy in each building in Block 8 of Al Qadesya.
- (4) Al Qadesya Co-Operative for the coordination with the residences of Block 8 in Al Qadesya to conduct the interview.
- (5) The residences of Block 8 in Al Qadesya for their occupancy behavior survey input and all necessary data related to their buildings.

4. DATA COLLECTION

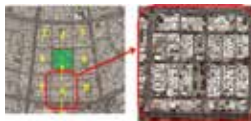
• Al Qadesya was selected for the study to represent the typical low rise residential neighborhood in Kuwait. The study specifically focused on Block 8 (200 houses) in Al Qadesya.

• It was selected based on three main criteria:

(1) It connects high density area (Hawalli) with low density neighborhood (Al Mansourya) which in turn connects to Kuwait City.

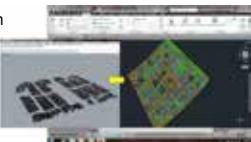


(2) The area were divided into well organized 9 square blocks which makes it easy to study, to model, and to analyze.



(3) The buildings are of a good mix of age (old and new), types of houses (private and public), and architectural styles.

• Typographic map (shown on the right side) was used as a layer in UMI to create a 3D model of the 200 buildings in Block 8 with their proper locations and orientations and then to conduct series of energy simulation runs.



• 30 houses were specifically studied in more details (shown as dark squares in the map).
• Approaching these households and having their approval for the interviews was a challenging task due to the private nature of the Kuwaiti families.



• Three main methods were used to approach the residences:

- (1) Invitation letters.
 - (2) Personal referrals.
 - (3) Referrals from Al Qadesya Coop members.
- The last two methods proved the most effective.

• Occupancy survey was conducted in each of these 30 house to collect detailed data about the way people and their houses consume electricity. The data includes three categories:

- (1) Occupancy behavior and scheduling.
- (2) Building design and material properties.
- (3) Thermostat settings, HVAC sizes and types, as well as all other equipments along with their operation scheduling.



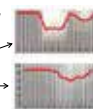
5. RESULTS

Occupancy Data:

• The number of the occupancies in the 30 surveyed houses ranges from as low as 5 people to as high as 43, averaging 13 people.

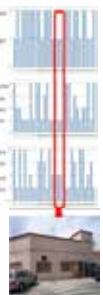


• The occupancy schedule during the weekdays, and during the weekends.



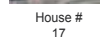
Building Data:

• The first figure to the right shows the type of glazing used in each building surveyed:
1. Single and
2. Double glazing.



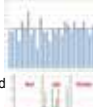
The second figure shows the tint of the glazing used.

• The third figure shows the type of materials used on the façade finishing in each of the surveyed house.



HVAC Data:

• The thermostat settings range from 16C to 27C averaging around 22°C.



• The number of houses grouped according to the types of cooling units: Packaged Roof units, Split units, and Window units.

For example, house #17 which was built in 1959 has single clear glazing with bricks as finishing materials; a typical building properties for such houses in this period.

All of the above data provided sufficient information to calibrate the model as shown in the figure to the right.



• Further analysis is needed to improve the calibration of the model. The 30 surveyed houses will be divided into 4 categories (archetypes) and their average data values will be analyzed separately.

6. IMPACTS

• The accuracy of the data is the main element for assuring the success of the project and the accuracy of its results and the following recommendations.

• The above analysis shed some light on the behavior of the Kuwaiti families and their buildings with regard to how they consume energy. More analysis is underway. Proper ideas and opportunities to suggest ways to reduce the energy consumption will be possible.

• **Acknowledgement.** The research team would like to thank the Kuwait Foundation for the Advancement of Science (KFAS) for their technical and financial support. The thanks extend to MIT and KISR teams for our collaborative efforts to make this study a success.

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Computing Sciences & Engineering





Analysis of Services' Behaviors Using Symbolic Aggregate Approximation (SAX)

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Abstract: In this research, we study the behaviors of services. More precisely, services' behaviors are modelled as symbolic time series, which are derived from a dataset of service performance based on Symbolic Aggregate Approximation (SAX) [3]. The symbolic time series are then clustered based on a hierarchical agglomerative clustering method. We finally provide a thorough analysis of the clustering results.

Introduction

Nowadays, there is a wide proliferation of services which makes pressure on services' providers to continuously improve the performance of their services. A service behavior captures the performance of the service during a certain time frame. Therefore, there is a need to monitor the behaviors of services to better analyze and control them. In this research, we propose a novel approach for the analysis of services' behaviors.

Objectives

The objectives of this research are:

- Modeling of services' behaviors using SAX method.
- Clustering services' behaviors.
- Analysis of services' behaviors.

Methodology

The architecture of the proposed approach is shown in (Figure 1). The original dataset [1] goes through the following phases to get the final result.

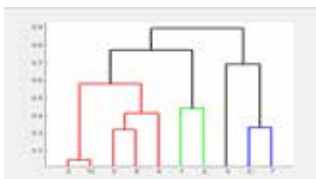
Phase 1: Modeling of services' behaviors using SAX method.

Real web services were recorded and then normalized - one attribute (response size) is considered here - to be ready to use. The resulting data is represented as time series. Time series are continuous m-dimensions datasets. SAX is a method to transform the time series into a symbolic representations which helps reduce dimensions and achieve numerosity reduction. We used the symbolic representation published in [2].



Phase 2: Clustering services' behaviors.

Services' symbolic data were used to produce the hierarchal agglomerative clustering using the Dynamic Time Wrapping (DTW) distance and supporting the "Complete" linkage. The "Dendrogram" function was used to create the clustering plot.



Phase 3: Analyzing the services' behaviors.

The resulted clustered services were categorized to six significant behaviors: stable, decreasing, upward shift, downward shift, up-and-down and normal average behaviors.

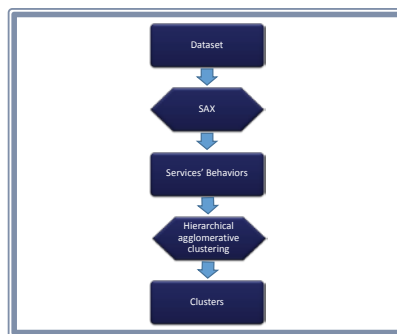


Figure (1): Architecture

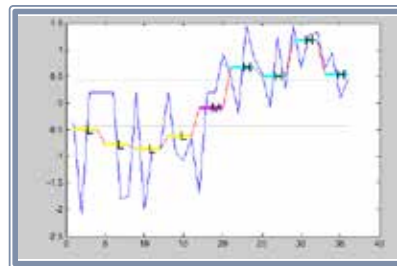


Figure (2): SAX representation

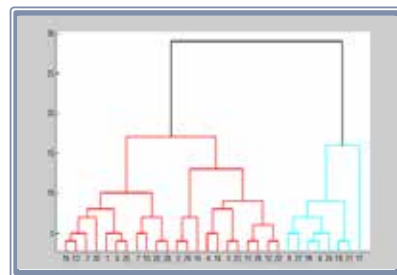


Figure (3): Services' Behaviors Clustering

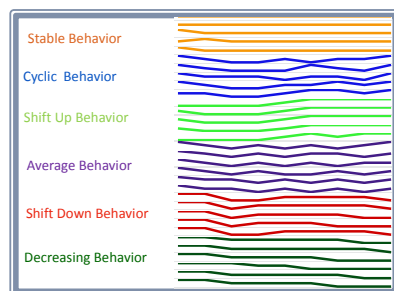


Figure (4): Synthetic Control Chart Of Services' Behaviors

Results

The input dataset consists of 1548 test-cases distributed over 36 days and had been modified to fit the SAX requirements in a way that the generated output was produced in symbolic representation as shown in (Figure 2).

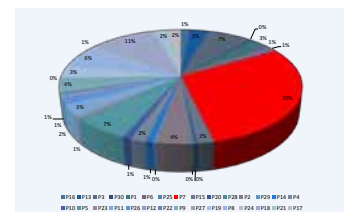
The web services' time series are represented by L (Low), M (Medium) and H (High). 1548 SAX representations were generated to represent the services' behaviors.

The hierarchical agglomerative Clustering method was applied on the generated services' behaviors from the previous phase to cluster the behaviors into six different groups (Figure 4) distributed under 30 dendrogram clustering points (Figure 3).

The clustered behaviors show how the web services differ over time. Each behaviors group is represented by a distinct color as shown clearly in (Figure 4):

Stable behavior (Orange), Repeated (cyclic) behavior (Blue), Shifted up (upward-shift) behavior (Green), Average (normal) behavior (Purple), Shifted down (downward shift) behavior (Red) and decreased (decreasing trend) behavior (Dark green).

After applying the three phases, we can conclude that the cyclic behavior was dominating during the 36 days of the experiment as shown below (Red sector), which means that most of the services' behaviors were varying between going up and down.



Conclusion

The Web services' behaviors can be analyzed in a better way than the traditional analysis concepts. SAX method helps in reducing the dimensionality and makes the time series easy to present and to analyze.

DTW-based hierarchal agglomerative clustering approach computes more precise distance calculations which provide a more accurate clustering.

Based on this work, services' behaviors can be predicted over time and indeed can be improved.

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Arabic Speech Recognition

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Abstract

Large vocabulary speaker-independent continuous speech recognition systems have recently received significant attention. In the last decade, there has been great interest by developers to have this distinctive property supplemented in new technologies such as search engines, voice maps, communications, etc. However, speech recognition poses some challenges such as varying acoustic conditions, dialects, and articulation at word's boundaries. This project demonstrates the ongoing research in the Arabic continuous speech recognition domain. Even though Arabic is a live language that is spreading widely throughout a large area, the research devoted to this technology still in the row stage compared to other languages such as English. The literature shows that the statistical method using Carnegie Mellon University (CMU) Sphinx speech recognition and the Cambridge University Hidden Markov Model Toolkit (HTK) are the preferable engines in this domain. However, there are some other methods such as artificial neural networks (ANNs) and support vector machines (SVM). The literature survey in this domain shows that the insufficient of publicly available continuous speech corpora deserve the research in this domain; it also shows the need to compile large Arabic corpora as a key factor to promote the related research. Therefore, this research aim at promoting the research in Arabic speech recognition by preparing a large speech corpus to be available for our research community at Kuwait University as well as make it available for other researchers. In fact, it is extremely expensive to have a continuous speech corpus as it takes long time for recording, transcription, diacritization, etc. The required corpora should mainly consider broadcast news using modern standard Arabic (MSA), the major medium of communication for broadcasting news in the Arab world.

Introduction

Automatic speech recognition (ASR) is the process of converting spoken language (sound waves) into a machine-readable text. That is, having human speech interpreted by a computer. Nowadays, the fast growth of powerful communication devices is making man-machine interfaces even more useful and pervasive. However, speech recognition is not an easy task and there is a long way for efficiently utilizing speech recognition to fulfil people requirements. Despite the successive research attempts, the high accurate transcription of human natural spoken words (speech-to-text) is still a difficult task problem and still an active research problem.

Objectives

- Exploring the Arabic continuous speech technology to produce research and tutorial for this Technogym.
- Preparing a large Arabic corpus to be a test bed for further research. This also facilitates many other related research problems such as speech synthesis, Arabic phoneme research , morphology and its role to enhance Arabic speech recognition, etc.
- Having such corpus will provide trusted results since our project's results will be based on a large speech corpus which is not available so far. In addition, the results will be investigated on two internationally known systems for speech recognition, Sphinx and HTK .

Methods

The work has 5 phases:

Phase 1: Literature review and problem formulation.

Phase 2: A suitable environment is prepared to record audio from several TV channels. This phase also include the transcription process of the recorded audio as well as having the transcription diacritized.

Phase 3: Corpus information write-up. All information regarding the corpus has to be documented such as the number of speakers, the total length of the recorded audio, etc. The corpus information might be presented in a conference or a workshop.

Phase 4: Once the corpus is ready for classification experiments, two recognizers (Sphinx and HTK) will be installed and investigated.

Phase 5: Results write-up. The results are expected to be reported and submitted to a journal paper.

Results

We are done regarding the following phases:

Phase 1: Literature review and problem formulation. A conference paper has been written and submitted that highlights the progress made so far in Arabic speech recognition domain and the future research directions. The review included the continuous and isolated Arabic speech corpora, the Arabic phonemes set, the language modes, the pronunciation dictionaries, the statistical methods using (CMU) Sphinx speech recognition and the (HTK) toolkit.

Phase 2: More than 40 hours of continuous speech have been recorded. We are currently moved to generate the transcription text file of the recorded audio.

Conclusion

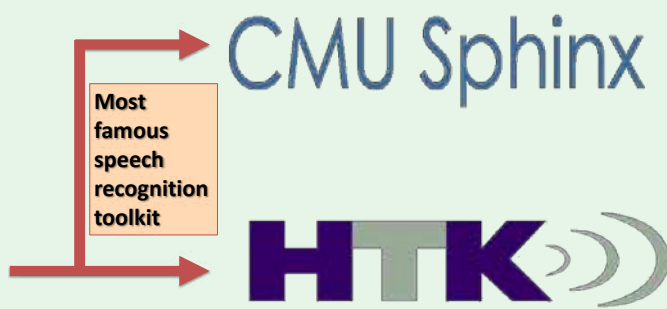
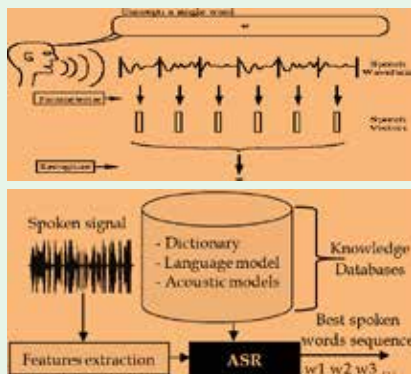
This project is still ongoing to perform the next phases. Hence, no experimental results available so far. The review of Arabic speech recognition shows that the research is still in the raw stage specially the continuous speech type. Most of the research are belong to isolated-words speech recognition. However, there are some research activities towards continuous speech recognition. The major obstacle is the corpora availability. Hence, reinforcing Arabic speech recognition needs support to generate a professional large Arabic continuous speech corpus. What have done so far indicates that compiling large speech corpus is a costly task as most steps have to done manually.

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Multi-Levels Arabic Text Categorization

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Abstract

Hierarchical text classification has been widely used in information retrieval (IR) systems. However, classifying Arabic text by utilizing the hierarchical topic structure has no enough attention and still is a limited research topic. It has been noticed that missing an Arabic a multi-level corpus is one of the obstacles in this domain. Therefore, we propose to overcome this difficulty (the missing of a multi-level corpus) by preparing a hierarchical corpus comprising of more than 15,000 news articles organized in a 3-level hierarchy of more than 50 topics. For categorization, we propose to use the top-down strategy using cosine similarity as a local classifier on each level of the category tree. An experimentally comparison has been conducted to measure the performance using two text features reduction methods, term frequency – inverse document frequency (TF-IDF) and latent semantic indexing (LSI). The results shows that cosine similarity measure scores 82.5% for the first level of the hierarchical tree, the research is ongoing to expand the test for the second and the third level. The research also proposed modification of weighing scheme TF-IDF and dual use of LSI with cosine measure.

Introduction

Text categorization (TC) is an important research domain that has been quite success in text mining and search engines. The high volume of online textual information storage enforces more attention for utilizing the existing rich hierarchical structure (also called multi-level) in information retrieval (IR) systems. In this project, we propose investigating the performance of multi-level Arabic text classification. The project includes preparing a hierarchical corpus comprising of more than 15,000 news articles organized in a 3-level hierarchy of more than 50 topics. The idea behind hierarchical model comes from the goal to reduce the computational complexity at each level and thus making the learning algorithm efficient. In fact, it is no longer justifiable to preserve text documents without a particular arrangement even with a small data collection. According to the literature, top-down approach produces consistent results when compared to other hierarchical classification methods.

Objectives

- Facilitating the research in the text categorization domain by producing a survey of the literature and the potential future research directions of Arabic text categorization.
- Introducing a reasonable multi-level Arabic text corpus (about 15,000 documents) to be a baseline for the Arabic text classification and other related research topics.
- Having such corpus will provide better results since it is based on a relatively large corpus that adds more confidence to the classification results.

Methods

The following are the steps to satisfy the project goal:

- Step 1:** The first step include preparing a multi-level corpus. The proposed corpus includes root, the internal levels nodes, and the leaf nodes.
- Step 2:** Preprocessing to remove the numbers, symbols, and the stoplist words (common words).
- Step 3:** Generating the features vectors using vector space model (VSM) and the weighting methods: TF-IDF and LSI.
- Step 4:** Applying the cosine similarity measure to find the overall classification performance at each leave node.

Results

So far, the project contributions include:

- Single level Arabic text classification has been performed using 4,000 documents. The cosine similarity measure scored 82.5% using a testing set that includes 400 documents. The next step is to expand the work for multi-level classification.
- The well-known weighing scheme TF-IDF was investigated and proposed a new modification using standard deviation. The modification enhanced the performance of Arabic text categorization by 6%.
- Dual use of latent semantic indexing (LSI) and cosine similarity measure also investigated and found that it can enhance the performance of Arabic text clustering by about 15%.

Conclusion

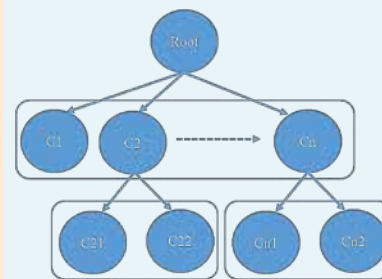
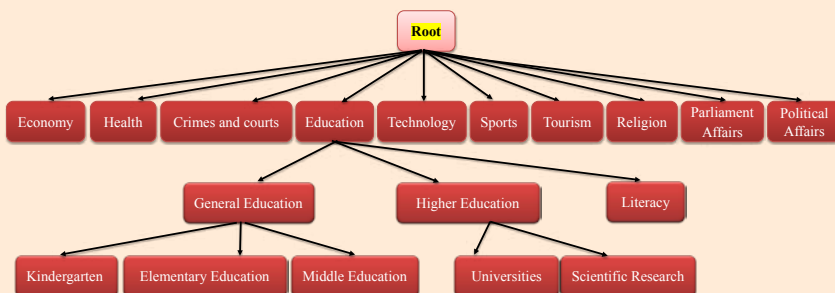
- It has been noticed that the most important part in text classification is the availability of a suitable corpus for the intended research, either flat corpus or hierarchical one.
- We also have noticed that the accuracy of classification methods based on the contents of the documents and the closeness to the category topic.
- Features reduction techniques is very important in this domain since the features set is very large.
- It is highly recommended to research using large corpora.

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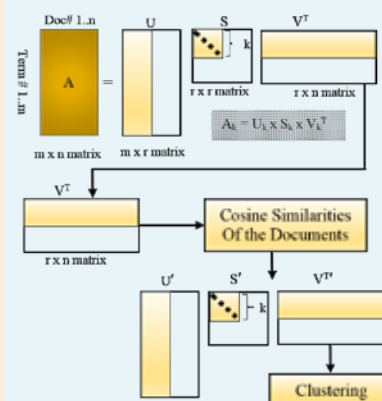
Acknowledgment

This work is supported by Kuwait Foundation of Advancement of Science (KFAS), Research Grant Number P11418EO01.



$$\text{standard deviation} = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

Weight (w) = TF-IDF * (1 - normalized (STD))





Text Based Tajweed Rules Identification Framework

Dr. Sa'ed Abed, Dr. Mohammad Al-Shayegi, Eng. Sari Sultan

Computer Engineering Department

Abstract

There are numerous applications that assist in studying and practicing Tajweed rules, which play a pivotal role in learning the Holy Quran. Nevertheless, these applications' development is impeded by the use of images instead of text. To the best of our knowledge, there are no published work (academic or commercial) that automates the process of highlighting Tajweed rules using text. This engenders numerous issues in Tajweed applications' development, such as increased application size, cost, and bandwidth usage. In this work, we propose a novel framework to find Tajweed rules using text instead of images. This framework aims to help developers to reduce the time, cost, and effort required in developing their applications; reduce application's size using text instead of images; and allow implementing features that were very hard to achieve using images. We implemented this framework using classic text search techniques and regular expressions, which showed more delicate and swift performance compared to the former. We achieved propitious results: size reduction by 98%; displaying more rules than what is already available on images; flexibility in which a student can select and view single or multiple Tajweed rules; and allowing copying colored text, with the rules, and pasting it in word editors. This framework should enhance and facilitate electronic Tajweed teachings development.

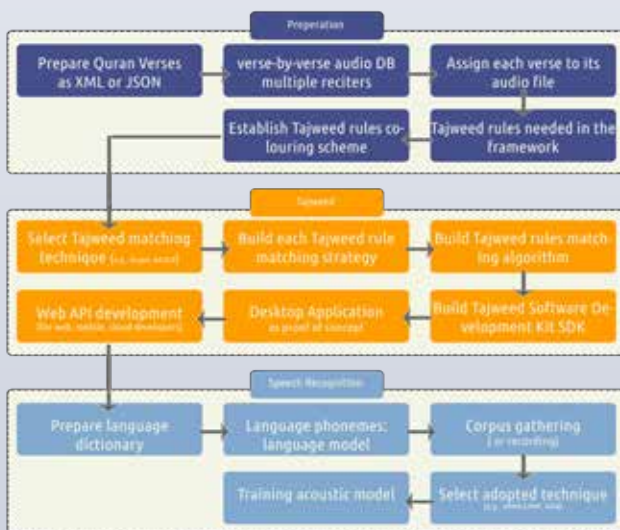
Introduction

- Coloring Tajweed rules is widely used in many applications.
- Coloring uses image based captures of the Quran.
- Very large application's size for current applications.
- Bad user experience, with limited applications' features.
- We propose novel framework to dynamically find Tajweed rules.
- The framework will include Tajweed recitation assistance, Quran verses audio delivery, and SDK support.
- The proposed framework should help developers to have features-rich applications, with minimal application's size.
- The proposed framework should enhance and facilitate Tajweed rules learning process.

Objectives

- We propose a specialized and efficient algorithm to find the Holy Quran Tajweed rules.
- We propose a framework that help the community to leverage our proposed abstraction level, which saves developers time, effort, and cost.
- The proposed framework reduces Tajweed software application's size by more than 98% (4mb instead of 205) by using Quran text instead of images.
- The proposed framework allow feature-rich applications, which will facilitate the student learning process.

Methods



Results

1. Size reduction of more than 98% (from 205 to 4 MB).
2. Faster loading speeds.
3. Resilience, in which users can show single or multiple rules if desired.
4. Provide flexible framework with easy to implement features, since working with text is much easier than with images.

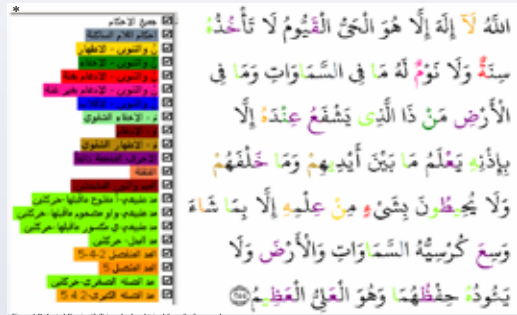


Figure 1. Aya al-Kari with Tajweed rules obtained from the Framework.

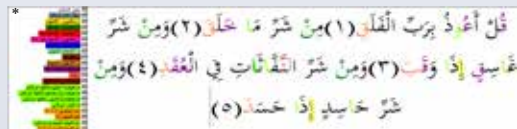


Figure 2. Surah Al-Falaq with Tajweed rules obtained from the Framework.

Conclusion

In this work, we implemented an efficient framework that finds the holy Quran Tajweed rules. The framework includes an innovative algorithms to locate each of the Tajweed rules. Additionally, the framework allows developers and students leverage many features, which help them to facilitate their development and learning process. To the best of our knowledge, this is the first proposed work that aims to find Tajweed rules dynamically. Locating Tajweed rules dynamically has many promising outcomes such as allowing interaction with text rather than using images of the Quran, implementing features easily for developers which is much harder to achieve using images, and size reduction. Additionally, the frameworks allows for teachers to copy the holy Quran text, with specific or all rules, and paste it in text editors while preserving the colored Tajweed rules; thus, provides efficient tool for teachers in this field. This framework needs further testing and development. This framework should enhance and facilitate Tajweed applications development, learning, and teaching.

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Acknowledgments

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Integrating crowdsourced human contribution into adaptive e-learning

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Abstract

E-learning is an attractive learning opportunity that eliminates time and space restrictions imposed by traditional learning activities. Many learners had great benefit from the availability of learning material and the flexibility of the e-learning process. Still other issues in the e-learning process needs to be addressed. Adaptive e-learning is the new trend towards more flexible and personalized learning material instead of a one-size-fits-all. It is a learner-centered approach that provides learners with an individualized engaging and responsive learning environment. Adaptive e-learning aims to improve e-learning experience through the automatic adaptation of lesson content and presentation to fit users' preferences and needs. This research proposes a framework for adapting learning content and lesson delivery through crowdsourcing and recommender systems to achieve a better personalized and adaptive e-learning experience.

Introduction

Personalizing the learning experience managed to enhance learners understanding in traditional learning situations [4]. In a technology-driven society, e-learning environments are widely adapted by many schools and universities improving the teaching quality and productivity, however, personalization in such environments is currently limited. Our goal is to create a framework that allows intelligent e-learning systems to deliver an effective personalized pedagogically sound learning experience [2][5].

Objectives

The objective of this research is to propose an adaptive e-learning systems framework to ease e-learning course content preparation and lesson delivery. Moreover, adaptive e-learning systems personalize the learning experience, motivate learners, and enhance course involvement and participation by meeting their needs and preferences. Crowdsourcing and recommender systems will be used to achieve a better-personalized and adaptive e-learning experience. The crowdsourcing will be incorporated in the learning content preparation and presentation while the recommender system will be used to gather formative feedback from the learners to support lesson adaptation [3].

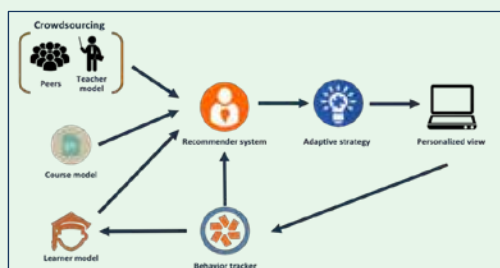
Methodology

- Identifying the requirements of adaptive e-learning in the context of crowdsourcing.

Based on the results of the literature survey, requirements of including the crowd contribution in e-learning is identified including: the crowdsourcing adaptive e-learning architecture, learning task distribution method, user collaboration mechanism and contribution handling.

- The identified requirements are analyzed in order to provide solutions that satisfy the needs of the learners and educator.

A framework integrating crowdsourced human contribution into adaptive e-learning is proposed.



Framework

The proposed framework allows e-learning systems to deliver an effective personalized pedagogically sound learning experience. Learning activities presented to each learner will be based on his/her characteristics and preferences [1]. The framework consists of seven main components:

- A learner model is a repository used to maintain information, including: the learner profile, learning preference, knowledge, competence, and learning style.
- A crowdsourcing tool then will be used to construct formative feedback for each peer that will not only indicate the weaknesses and strengths for every peer group in class material, but also help in preparing the next lesson.
- The course model includes course pre-requisites, objectives, concepts and course structures. All of the information will be statically maintained in the repository except for the course structure that will be dynamically set by the recommender system.
- The teacher model, an expert system optimized through crowdsourcing. The knowledge-base of the expert system will encompass skills and experiences from different teachers in the same field. It will have a great role in the adaptation in which the lesson preparation depends on the teacher model that results in creating the best possible lesson for the learners.
- A recommender system used to prepare the lesson content, select learning strategy and assessment method to fit to individual learners needs. When either the learners or teacher requests a learning activity, the system will personalize and adapt the lesson preparation and delivery based on the learner profile and preferences, by recommending the content and learning strategy (what to include and how the content is organized). It will also recommend improvements on the existing lessons.
- The behavior tracker server that provides automated data collection by tracking the navigational paths of the learners, their progress, and their ratings of each learning object presented to them.
- The personalized view model is concerned with the interface design of the e-learning systems. The learner will use the view or the user interface to see, read, interact, navigate, and comprehend the e-learning content. This offers a customization options for the user interface, which will allow the learner to obtain a unique experience of the learning platform.

Conclusion

The proposed framework utilizes crowdsourcing and recommender systems to provide a personalized e-learning experience. The crowdsourcing was incorporated in the learning content preparation and presentation. The framework also uses a recommender system to gather formative feedback from learners to support lesson adaptation. This framework motivates learners and enhances course involvement and participation. For future work experiments will be conducted to evaluate the effectiveness of the proposed framework in terms of improved learners' academic achievements and cognitive development processes.

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Optimization Of Quantum Circuits for 2D Nearest Neighbor Realization

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Abstract

Realization technologies of quantum circuits vary in the type of constraints imposed during synthesis. Nearest Neighbor (NN) architecture is required in certain technologies where only physically adjacent qubits are allowed to interact. In this work, we present a Harmony Search (HS) based algorithm to efficiently realize quantum circuits on two dimension grids by utilizing input line assignment in NN architecture. Experimental results show that when compared to recent 2D NN optimization method, the proposed algorithm was able to reduce number of swaps needed by 28% on average and in the best case by 50%. The implemented algorithm is very efficient and is able to find optimized circuits with time of 4 seconds in the worst case.

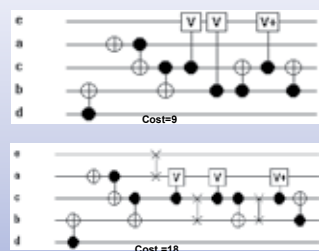
Introduction

- Quantum computing is one of the most important emerging technologies
- Information in quantum circuits are represented using quantum bits (qubits)
- When qubits are not adjacent, SWAP gates are inserted, thus increasing cost of realized circuit
- Many researchers addressed nearest neighbor problem in 1D
- In this work, we address the problem for 2D grid realization

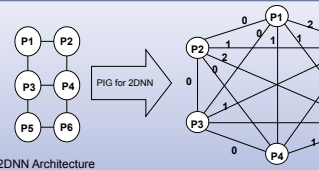
Objective

- Formulate the problem as mapping any quantum circuits to a 2D grid architecture with minimum cost as task/processor assignment problem
- Devise and implement a population-based Harmony Search heuristic to solve the problem
- Run algorithm on benchmark circuits and compare results with other similar approaches

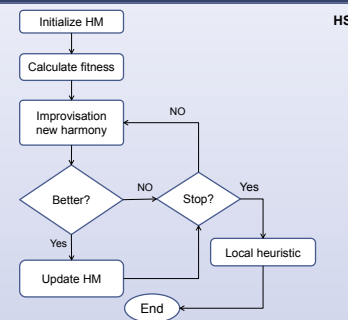
Motivation: Gate Cost



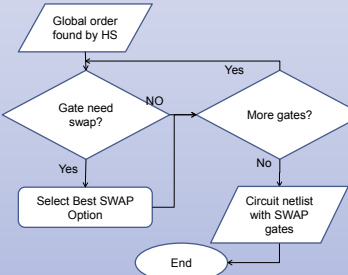
Problem Formulation



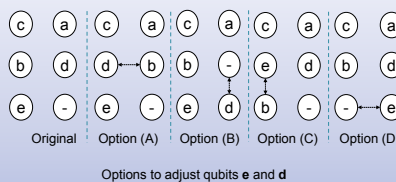
Proposed Algorithm



Local Heuristic



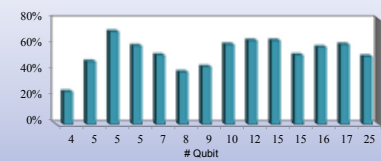
Local Heuristic



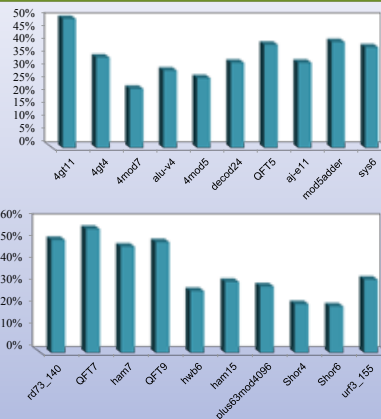
Results

- Experiments conducted on number of benchmarks:
 - Number of inputs 3 to 12
 - Number of 2 qubit gates 7 to 132340
- Compared to LNN, proposed algorithm reduced number of swaps by 47% on average
- Reduced number of swaps by 28% on average compared to [2]:
 - Max = 51%, Min= 3%
- Compared to optimal solution formulated as pseudo Boolean Optimization [3], all solutions but one were found with negligible run time

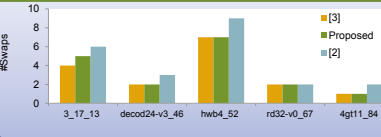
2DNN vs LNN (% imp)



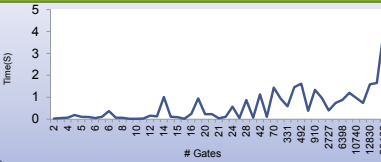
Proposed vs. [2]



Comparison with [3] (Optimal)



Execution Time



Conclusions

- Formulated 2DNN circuit realization as task-processor assignment problem
- Devised HS based heuristic to find efficient input assignments for 2DNN architecture
- Experimental results demonstrated advantages of the proposed algorithm:
 - Execution time
 - Quality of the solutions

Acknowledgments

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A Taxonomy for Moving Object Queries in Spatial Databases

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Abstract

Moving objects have different features from static objects which may lead to a variety of queries. The aim of this poster is to provide a complete picture of the capabilities of moving object queries and propose a taxonomy of moving object queries.

Introduction

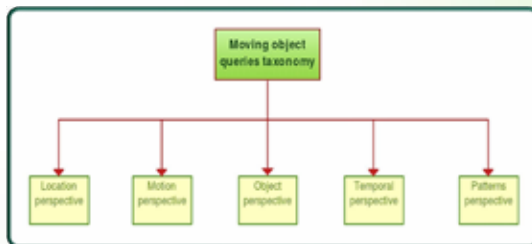
Moving objects require a higher update frequency and tracking them is essential for big data applications. Therefore, the indexing of moving objects plays a critical role in query processing. The storage and manipulation of moving objects will be based on spatial information representing static geographical objects alongside temporal information. The main goal is to disclose the variety of possible queries about moving objects in spatio-temporal databases. In this poster, we present taxonomy for moving object queries. The queries about moving objects can be performed in different environments which include the Euclidean space, spatial road network and cellular space.



Moving Object Data Structures and Targeted Queries

Many works have been proposed to accommodate the intensive updating which is the main issue when indexing moving objects databases and focusing on minimizing the cost for each update. Index structures also aim to obtain a logarithmic search complexity. Many data structures have focused on the location perspective which includes the common queries in the spatial databases. Some concentrate on temporal moving objects use the time-stamp. A limited ones concentrate on the motion perspective in the construction of the moving objects' data. The majority of the current data structures focus on moving points with a lack of attention to moving lines and moving regions.

Moving Object Queries Taxonomy



•Location perspective

The location perspective considers the location as the key element in the moving object queries. It includes many query types; Spatial, Navigational, Topological, N-body constraint, and Aggregate queries.

•Motion perspective

Motion can be observed by linking a reference to a moving object and measuring its location change relative to another reference frame. It can be classified as: Velocity, Direction, Distance, and Displacement queries.

•Object perspective

The object perspective considers the object characteristics as the key element in the query. It can be classified as follows: Object-type, and Object-form queries.

•Temporal perspective

The temporal perspective includes queries about the moving objects which concern to the temporal (time) aspects and characteristics of the moving objects. It classified as follows: Trajectory, Timestamps, Inside temporal, Disjoint temporal, Meet temporal, Equal temporal, Contain temporal, Overlap temporal, and Period temporal queries.

•Patterns perspective

The query in patterns perspective depends entirely on the objects' predefined movement patterns. They are classified as: Spatial, Spatio-temporal, and the temporal patterns.



Conclusion

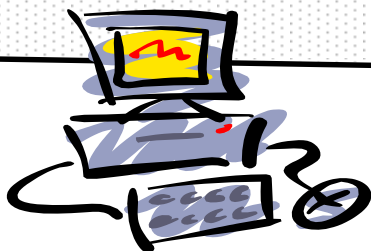
In this poster, we propose a taxonomy for moving object queries to address the variety of queries that can be raised about moving objects of interest. This research focuses on geo-referenced moving objects, which consume geographical space and the environments of the moving objects. The queries taxonomy mainly uses five perspectives to retrieve moving objects which include: The Location perspective, the Motion perspective, the Object perspective, the temporal perspective and a Patterns perspective. Each perspective has been defined in a concise and expressive way according to a number of characteristics.

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Future Research

In future research, we intend to extend our taxonomy model to include the query processing of queries about the object queries. A data structure needs to be built in order to support some of the new moving object queries, especially after finding a lack of support for these queries in the current moving object data structures.



Department of Information Sciences
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Engineering

Influencing Electronic crimes Factors in Kuwait Society

Mariam M. Alansari, Zainab M. Aljazzaf, Muhammad
Sarfranz



Abstract

E-crimes any crimes that involve networks and computers. This research work mainly focused in identifying the most common e-crime factors in Kuwait. This research focused on indentifying the most e-crime factors in Kuwait. In addition, it shows e-crime awareness of Kuwaiti people, and the relation between social media and e-crimes.

The results showed that there is a statistically significant relationship between factors of e-crime, it is recommended a series of proposals, the most important is to enact laws that deter the society from committing e-crimes and raise awareness among citizens.

Introduction

The internet is used for different purposes depending upon the requirements like communication, research, education, financial transactions, trading, and real time updates. The internet has also become an environment where the most lucrative crime is conducted. This research focuses on electronic crimes broadly known as e-crimes, refers to criminal activity that involves the internet, a computer or other electronic devices.

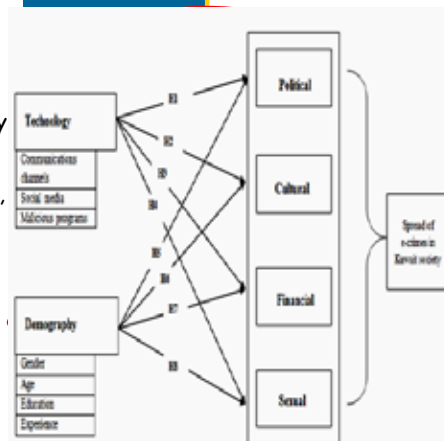
Objective

To determine e-crimes factors and examine the influence of the e-crimes factors that make e-crimes spreading in Kuwait society.

Methods

A model was build and 593 people from Kuwait Society were surveyed. The collected data were analyzed using multivariate statistical methods.

Conceptual Model



Results

The results showed that there is a statistically significant relationship between the two factors of e-crime which are: technology and demography with four factors are : political, cultural, financial, and sexual that has considerable influence on Kuwait society towards e- crimes.

Conclusion

This study illustrated that there has been an impact of technology and demography with the four factors of e-crimes, which are identified by the study. Besides that, it illustrated that Kuwait government has delayed to enact a special law of e-crimes as compared to many other countries. In light of the result, it is recommended a series of proposals, the most important is to enact laws that deter the society from committing e-crimes, and raise awareness among citizens. Future research can test each factor of e-crimes in term of how serious its effects on human mentally and emotionally. This will increase and improve the research on the risk of e-crimes.

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FACTORS INFLUENCING E-PARTICIPATION IN KUWAIT E-GOVERNMENT



Sharifa Al-Ali, Zainab Aljazzaf, Muhammad Sarfraz
Department of Information Science/ Computing Sciences and Engineering

Abstract

E-Participation concentrates on the citizens and how to engage, encourage and make them involved. This research seeks to find out the critical factors affecting e-participation in Kuwait. To attain the purpose of the research study, a conceptual model has been developed based on TAM, and a questionnaire is designed and used to test the conceptual framework.

Introduction

The increasing interest in e-Government led to the increasing in public expenditure on Information and Communication Technologies (ICTs). E-Participation is facilitated by ICTs and known as the opportunity for citizens to interact with government.

Objectives

- Deliver the best understanding of e-Government and e-Participation
- Find out the critical factors influencing e-Participation in Kuwait's e-Government
- Seeks to attract citizens to participate in e-Government

Results

The results indicate that Kuwait has a low level of e-Participation index. Technical factors, social influence, political factors, perceived usefulness, and perceived ease-of-use influence e-Participation in Kuwait.

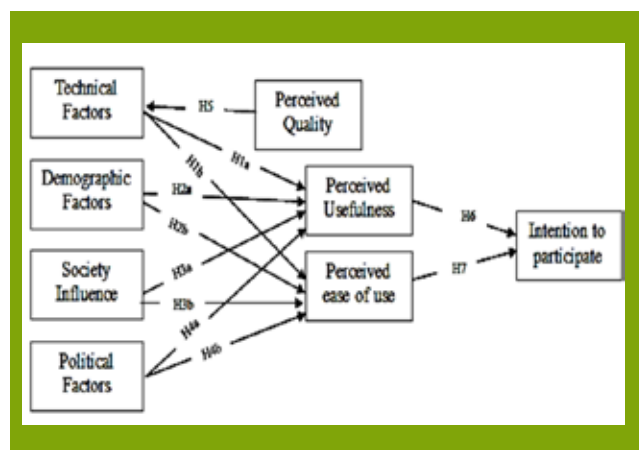
Conclusion

Most governments provide online information and services to their citizens and residents which is very common in the world. To improve e-Participation, the government has to work hard in marketing and advertising, and provide call centers and WIFI.

Methodology

- Identify e-Participation factors
- Build e-Participation model
- Develop a questionnaire
- Conduct data analysis

Conceptual Model



References

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A Framework for Data Aggregation in WSN Using IoT Mobile Elements

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 Department of Information Sciences, College of Computing Sciences and Engineering

Abstract

Wireless Sensor networks (WSN) form an active research area mainly due to the potential of their applications such as agriculture, health, environmental monitoring, habitat monitoring, battlefield surveillance, wild fire detection and office automation. Due to limited life time of sensors and short communication range, data aggregation is needed. We consider the data aggregation in WSN using IoT Mobile Elements. We aim to develop an effective aggregation technique such that it is able to extend the network lifetime, while effectively gathering data.

Introduction

Wireless Sensor Networks (WSN) consists of large number of sensing devices (sensors)

- Sensors in WSN
 - Distributed among geographical areas
 - environmental monitoring
 - flood detection
 - Attached to specific objects
 - patients in health-care apps.
 - cars in traffic control apps.

WSN : Raising issues?

- Sensors:
- limited life time
 - short communication range
 - Need for aggregation to save energy

Cluster Based Aggregation

- Group sensors into clusters
- Elect Cluster Head (CH)
- Other sensors send data to CHs
- CHs send data to base stations

- i.e.: Two layers sensor networks
- Save energy
 - increase Network Lifetime

Internet of Things (IoT)

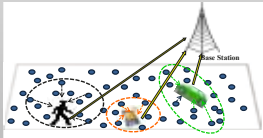
- Connect the different objects (smart-phones, sensors, and people) to the Internet allowing accessibility to the data.
- WSN data becomes accessible through the IoT providing sensing services to the users.
- Connectivity of the framework:
 - Static sensors, moving elements, and the base station communicate over low power Wi-Fi radio.
 - Base station is the gateway to the Internet
 - The base station pushes the data to the web-servers or the cloud

Objectives

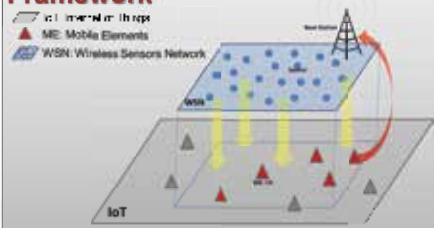
- To increase the life time of WSNs
- To effectively use up-to-date technologies, i.e IoT

Methods

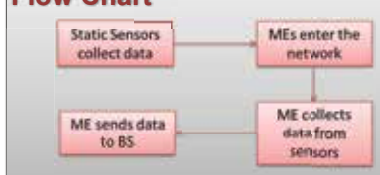
- Divide the objects in a WSN network into two classes:
 - static sensors
 - Moving Elements (ME) : sensors attached to moving objects that pass by the WSN based on the defined application (i.e: cars, mobile phones, people, etc ...)
- The role of each class is as following:
 - Static sensors work as any sensing elements in a traditional WSN. They sense the required data continuously.
 - Moving elements ME: act as cluster heads (CHs). They enter the network at any time and collect the data from sensors in their range, then send the collected data to the base station at the end of the round.



Framework



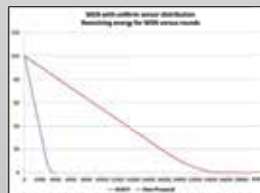
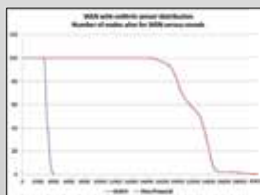
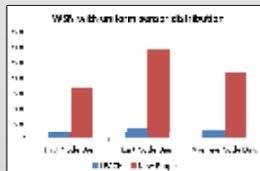
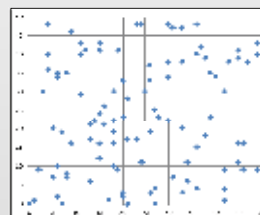
Flow Chart



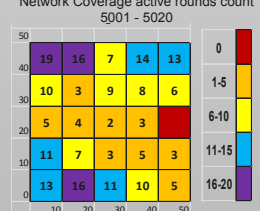
Results

Tests are applied on both uniform and non uniform sensor distribution networks

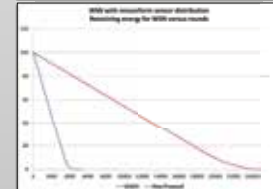
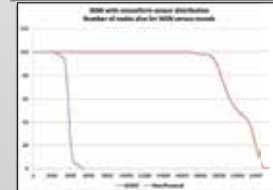
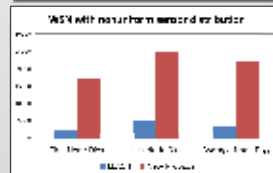
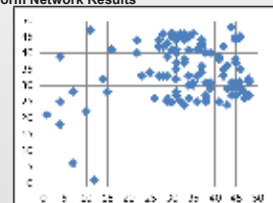
1. Uniform Network Results



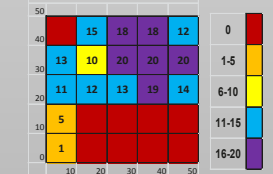
Network Coverage active rounds count 5001 - 5020



2. Uniform Network Results



Network Coverage active rounds count 5001 - 5020



Conclusion

We developed a new framework that integrates WSN and IoT to aggregate data effectively. Our aim was to increase life time of WSN. Simulation results showed that proposed solution extends the network life time and can work on both uniform and non uniform WSNs. Results also showed that the proposed solution is able to cover the whole network within small period of time.

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Engineering & Petroleum





A COMPLEX WATERFLOODING CASE: IN-SITU W/O EMULSION FORMATION

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Abstract

We study macro- and micro-scale waterflooding performances of unique crudes from Qatar and USA, which can naturally form w/o emulsions in the reservoir when mixed with water and different brines—including the reservoir brine. The waterflooding performance of these crudes challenges the classical behavior of EoR by waterflooding. Waterflooding tests are conducted in Berea cores and in microfluidic chips with and without initial water saturation. We observe intense pressure fluctuations in waterflooding, higher injection pressure at lower injection rates, lower ultimate oil recovery and higher recovery at breakthrough with the initial water saturation, which are all surprising. The experimental results are explained by deep bed filtration theory.

1. Introduction

Emulsion flow in porous media found attention in oil industry after McAuliffe used o/w emulsions to improve the mobility ratio between displacing and displaced fluids in waterflooding [1]. Emulsification has been an import oil recovery mechanism to reduce residual oil saturation by adding surfactant, alkaline, or surfactant-alkaline additives to the injected brine [2]. Moreover, the use of surfactant with polymer additives is currently a hot topic in heavy oil recovery to improve the mobility, and the oil recovery through o/w emulsification [3].

Here, we report a complex waterflooding behavior for unique crudes which can naturally form w/o emulsions without the addition of any chemicals [4]. Our results can not be described from continuum fluid view; we use deep bed filtration theory [5] to describe the surprising experimental results of dynamic and unstable emulsion flow in porous media in the process of waterflooding.

2. Objectives

To investigate the effect of injection rate, initial water saturation and crude oil, on injection pressure and oil and water production performance of waterflooding process.

We are also interested in the mechanisms of complex emulsion flow in porous media, by conducting waterflooding tests in microfluidic chips.

3. Methodology

Cores:

Berea type
Dimensions: Length=6" and OD=1.5"
Porosity = 20 – 23 %PV
Permeability = 200 – 350 mD

Fluids:

Two crudes from Qatar reservoirs
nC₇ as reference oil
Synthesized reservoir brine
Cleaning solvents (toluene, dichloromethane, methanol)

Aging:

The cores are aged with crude oil for 30 days, and 20 days for tests without and with the initial water saturation, respectively.

Waterflooding (WF):

The tests are conducted in cores and microfluidic chips at room temperature and atmospheric outlet pressure; the injection pressure, and the cumulative oil and water production are measured over time. The tests are conducted at 1 and 5 PV/d with and without the initial water saturation for two different crudes QO-2 (19 cP) and QO-9 (92 cP).

Emulsion type and stability:

We conduct emulsion analysis in test tubes to study the stability of emulsions over time. Their stability are analyzed for about 2 years. The emulsion type is studied by 3D microscopic imaging with light exposure.

Rheology:

We study bulk and interfacial rheology of crudes by ring method.

4.1. Results/discussions: Emulsion analysis

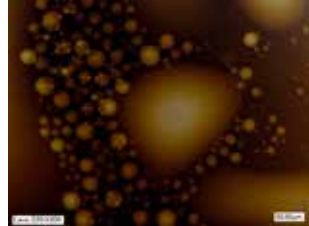


Figure1: 3D microscopic image of w/o. An interfacial film separates water inner droplet from outer water droplets attached.

4.2. Results/discussions: Waterflooding

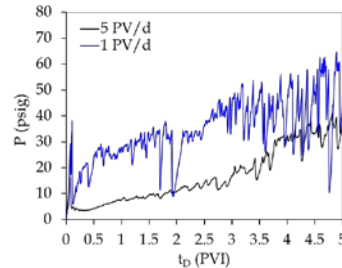


Figure3: Effect of flowrate on injection pressure for crude QO-9; significant pressure drop and pressure fluctuation are due to emulsions. At higher flow rate, the interfacial elasticity, emulsion entrainment, and lower interception causes lower injection pressure.

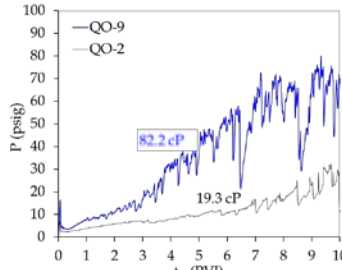


Figure4: Effect of oil viscosity on injection pressure at 5 PV/d.

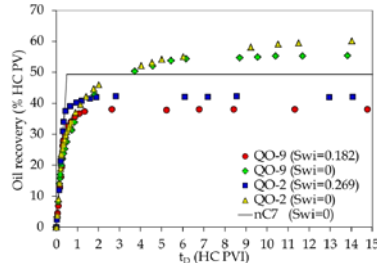


Figure5: Oil recovery performance with and without initial water; with initial water, emulsions initially block the pore which cause re-routing for water phase and therefore higher breakthrough recovery, while ultimate recovery is lower because of permanent pore blockage.

Table1: Summary of waterflooding production characteristics.

Run	Crude	Q _{inj} (PV/d)	S _{wi} (PV)	RF _{BKT} (HC PV)	RF _{Sor} (HC PV)	S _{or} (PV)
1	QO-2	5	0	0.235	0.602	0.398
2	QO-2	5	0.269	0.357	0.422	0.424
3	QO-2	1	0	0.257	0.586	0.414
4	QO-9	5	0	0.150	0.554	0.446
5	QO-9	5	0.182	0.267	0.381	0.507
6	QO-9	1	0	0.158	0.582	0.418
7	nC ₇	5	0	0.492	0.493	0.507

4.3. Results/discussions: Flow visualization

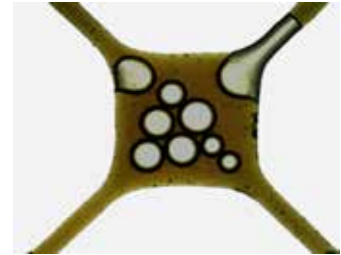


Figure6: Presence of micro and macro emulsions

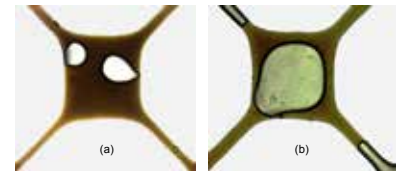


Figure7: Pore blockage by (a) interception (b) straining

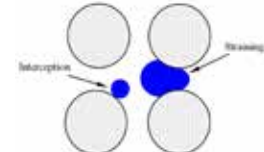


Figure8: Pore blockage mechanisms: interception and straining; at higher injection rate, captured w/o droplets can be mobilized.

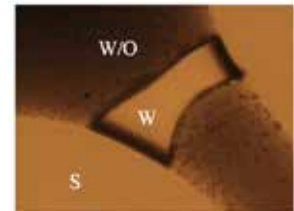


Figure9: Accumulation of w/o emulsions at water-oil interface which contribute to interface elasticity

5. Conclusions

For those unique crudes which naturally form in-situ w/o emulsions, the following conclusions are made in waterflooding; They are explained because of interfacial elasticity, pore blockage, and re-entrainment by emulsion droplets (which was facilitated at higher injection rates):

- Stable w/o emulsions when oil is mixed with water/brine.
- Significant pressure drop and pressure fluctuation.
- Higher injection pressure drop at lower injection rate.
- Initial pressure spike for flow initiation.
- Lower ultimate recovery with initial water in cores.
- Higher breakthrough recovery with initial water in cores.

6. Acknowledgements

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- Prof. Clay J. Radke of University of California, Berkeley.
- Prof. Gerald G. Fuller and Mr. H.-K Dong of Stanford University for rheology measurements.

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CO₂ Storage Using Ex-Situ Process: Energy and Environmental Applications

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Abstract

Consumption of fossil fuels along with accelerated deforestation is leading to a significant increase in concentration of greenhouse gases (e.g., CO₂) in the atmosphere. Carbon storage is considered a promising alternative to lower the amount of CO₂ emissions. CO₂ has proven potential for EOR operation in petroleum reservoirs and storage in saline aquifers. However, CO₂ can flow upward due to buoyancy effects and leak through thief zones during geological sequestration. To tackle this matter, the Ex-Situ Dissolution (ESD) concept is introduced aiming at full dissolution of CO₂ at surface facilities, before it is injected into the underground formations. A mathematical model was developed to formulate the size of the CO₂ droplets in terms of process parameters for the ESD technique. The proposed model explicitly accounts for mass transfer and pressure changes along the pipeline length employed in ESD. The introduced model is able to determine the size variation of CO₂ droplets and the length of pipeline required for complete dissolution of droplets before injecting CO₂ into the porous media (e.g., saline aquifers and depleted reservoirs).

1. Introduction

In the past few decades, Carbon Capture and Storage (CCS) has been an attractive and a viable option to lower the CO₂ concentration emitted into the atmosphere [1-4]. CCS in deep aquifers (e.g., saline aquifers) is considered as one of the promising techniques to mitigate this issue and to lessen the growing effects of the global warming [1-4].

Technologies currently available for the CO₂ storage in saline aquifers face some technical challenges and issues [3-5]. Current practice for CCS technology, it is assumed that CO₂ is injected as a free single phase into the target formation. Driven by density contrasts, CO₂ flows upward by buoyancy forces, collecting at the top of the formation, and it can leak through fractures or through abandoned wells to the surface [3-6].

The Ex-Situ Dissolution (ESD) approach can be considered as a potential promising storage strategy with a fairly low degree of uncertainties [6,7]. Burton and Bryant (2009) addressed some technical and economical features of this technique [4]; however, important aspects such as droplet hydrodynamics, time or volume required for full dissolution, pressure build-up, and extensive economic evaluation are missing from this study. The ESD includes mixing of CO₂ into brine along the pipeline and then injecting the mixture into the target formation. Since the CO₂-brine system is hydrodynamically unstable, the liquid CO₂ injected in the pipeline, with brine being the continuous phase, will break up into droplets in the brine phase. Understanding the behavior of a dispersed system is useful for the design and scaling up purposes. This is due to the fact that the interfacial area of droplets, physical properties of the ambient phase, and the flow regime affect the transport phenomena.

2. Objectives

- To present formulation of mass transfer and pressure drop for liquid CO₂ droplets in ESD operation.
- To introduce a comprehensive analytical and numerical modeling of CO₂ droplets breakup/coalescence during the ESD.
- To evaluate technical and economic feasibility of ESD process for CO₂ sequestration through a systematic way

3.1 Methodology: ESD Technology

The ESD (Figure 1) involves sparging of the captured CO₂ into brine, dissolving the CO₂ droplets, and then injecting the CO₂ saturated brine into the underground formations (e.g., saline aquifers).

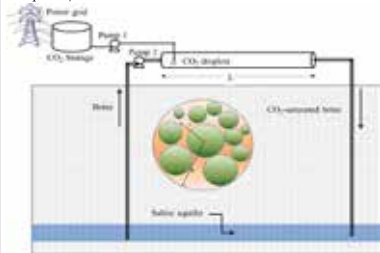


Figure 1: Schematic of ESD for CO₂ storage

3.2 Methodology: Modeling

The population balance equation for CO₂ droplets is given as follows:

$$\frac{\partial N}{\partial t} + \nabla_r(\nu N) = -\frac{\partial}{\partial r} \left(N \frac{\partial r}{\partial t} \right) + Q_b + Q_c \quad \text{Eq.(1)}$$

The boundary and initial conditions to solve Eq. (1) are:

For $t = 0$ and $r < R$; $N = N_0$
 For $t > 0$ and $r = R$; $N(R, t) = 0$
 For $t = \infty$; $N \approx N_0$

The analytical solution of Equation (1) is obtained as below

$$N(r, t) = N_0 + \sum_{k=1}^{\infty} c_k J_0 \left(\alpha_k \left(\frac{r}{R} \right)^{1/2} \right) \exp(-\alpha_k^2 k_d t) \quad \text{Eq.(2)}$$

Droplet size as a function of time is obtained:

$$d_p = \left(3.2 \beta_0 (\theta_{in} - \theta_0) k_d^2 t^2 + d_{p0}^3 \right)^{1/3} \quad \text{Eq.(3)}$$

For horizontal pipe:

$$\frac{d(d_p)}{dt} = \frac{2k_d C_c}{\rho_p} \frac{k_d \phi_0}{1 - \phi_0} \left[1 - \left(\frac{d_p}{d_{p0}} \right)^3 \right] \quad \text{Eq.(4)}$$

For vertical pipe:

$$\frac{d(d_p)}{dt} = \frac{2k_d C_c}{\rho_p} \frac{k_d \phi_0}{1 - \phi_0} \frac{\rho_{br}}{\rho_p} \left(\frac{d_p}{d_{p0}} \right)^3 - \frac{d_p \rho_{br}}{3\rho_p} \frac{Mv_r U}{Z_{at} R T_m} \frac{f U^2}{D} \left(\frac{1}{6} - g \right) \quad \text{Eq.(5)}$$

4. Results/discussions

Figure 2 shows droplet diameter change at brine flow rates. Rates of reduction in diameter are different as greater brine flow rate causes more turbulence, thus a higher mass transfer rate.

The horizontal mixing pipe in the EDS can be replaced by wellbore tubing. Increase in hydrostatic pressure in the vertical well leads to acceleration in the droplet shrinkage and consequently the dissolution rate (Figure 3).

Figure 4 depicts variations of droplet size as a function of bubble hold-up. Based on the expression, $\phi_b \rho_b V_{bip}$ the droplet volume fraction causes an increase in the concentration of CO₂ dissolved in the ambient brine phase, reducing the concentration difference on the droplet boundary and reducing the rate of mass transfer. There is no significant droplet size change observed within the CO₂-brine bubbly flow regime. Figure 5 shows the droplet size distribution for the liquid CO₂ in brine phase.

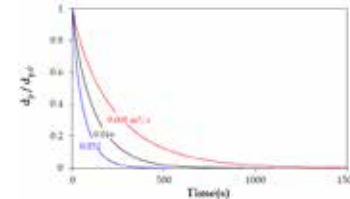


Figure 2: Effect of brine flow rate on dissolution behaviour

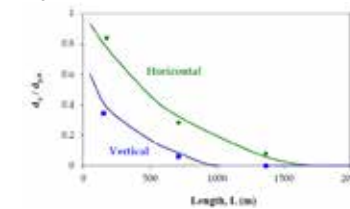


Figure 3: Effect of pipe orientation on droplet dissolution

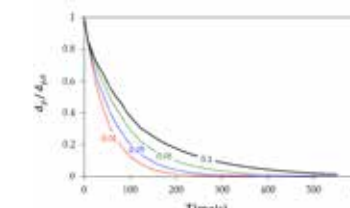


Figure 4: Ratio of droplet diameter versus time for different hold-up

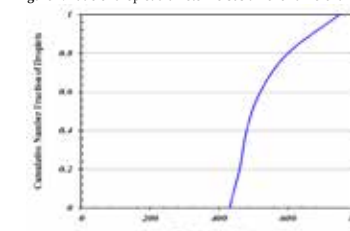


Figure 5: Droplets population versus droplet diameter

To quantify the effects of pressure difference and mass transfer on the droplet shrinkage, Figure 6 is plotted. It is obvious from the figure that the effect of pressure on droplet shrinkage increases as the CO₂ droplets move forward and approach to the end point of the pipeline. Although the effect of pressure change is small compared to that of mass transfer on the droplet shrinkage, this factor affects the droplet volume considerably when the pipeline is long enough or the saline aquifer is deep (e.g., height or length >1000 m). In addition, Figure 6 shows that no significant change in the droplet size is observed and the mass transfer driving force tends to diminish when the droplet volume becomes very small. This condition corresponds to a fairly long time duration that the CO₂ droplets are in touch with the brine phase. In this case, the effects of both parameters remain almost constant as the mixture goes down along the pipeline or well length.

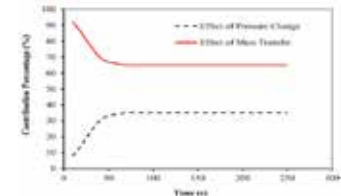


Figure 6: Contribution of mass transfer and pressure in droplet shrinkage

The concentration of CO₂ in brine is almost 5% in the real cases undergoing the ESD; thus, the possibility of coalescence occurrence is low.

Further research is necessary in order to address the different aspects of the ESD before its field implementation for large scale geological sequestration of CO₂. Research projects are underway to address the interaction between CO₂ droplets and also assess economic feasibility of the ESD with more details.

4.2 Results/Discussions: Cost estimation

- Drilling and completion of 2 wells cost US\$ 10-15 million
- Pumps and associated controls cost US\$ 100K
- Operating cost for pumping 1Mt/year costs US\$ 100 K/year
- Capital cost for a full Carbon Capture and Storage (CCS) plant is US\$ 450 million for each 1 Mt/year
- The capital cost for Ex-situ dissolution is ~2.5% of the capital cost of the full project.

5. Conclusions

This study introduces a new engineering methodology for acceleration of CO₂ dissolution that could be beneficial in providing greater CO₂ storage security as well as capable of being used along with deep disposal of saline water such as co-produced water from oil and gas wells. The main conclusions can be drawn as follows:

- Numerical and analytical models were developed to predict the droplet size along a pipeline when a bubbly flow regime is established for a turbulent dispersed system.
- The pipeline orientation, brine flow rate, and CO₂ hold-up are dominant parameters governing dissolution rate.
- The variation of the droplet size results from two features: mass transfer from the CO₂ droplets and pressure change.
- Full dissolution of CO₂ in brine before sequestration is feasible using the ESD.
- The wellbore tubing could eliminate the need of having a long horizontal mixing pipe in the ESD.

6. Acknowledgements

The authors wish to thank the Natural Science and Engineering Research Council of Canada (NSERC) and MITACS Elevate for the financial support of this research.

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ION CONCENTRATION POLARIZATION PROCESSES AS NEXT GENERATION DESALINATION TECHNOLOGIES FOR KUWAIT

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Abstract

High Saline Desalination (> TDS 35,000ppm) is not efficient or economical with current existing technology (MSF), neither is it environmentally sound. The environmental impacts of discharge from desalination plants is costing the marine ecosystem of the Arabian Gulf very dearly. A recent and currently-used innovation in desalination, the reverse osmosis (RO), is not practical for brine desalination. Here we propose the technical feasibility of improving the efficiency of ICP (Ion Concentration Polarization), an electrical desalination technology specially designed by our group, for the high saline water treatment, in a multi-stage operation designed for better energy efficiency. The incorporation of spacer like structures for achieving energy efficiency and (membrane) area efficiency, is being investigated to lower the true cost of brine treatment. Apart from high saline brine desalination, ICP electrical desalination has the added advantage of removing both salts and diverse suspended solids simultaneously and is less susceptible to membrane fouling / scaling, a significant challenge in any membrane process.

Introduction

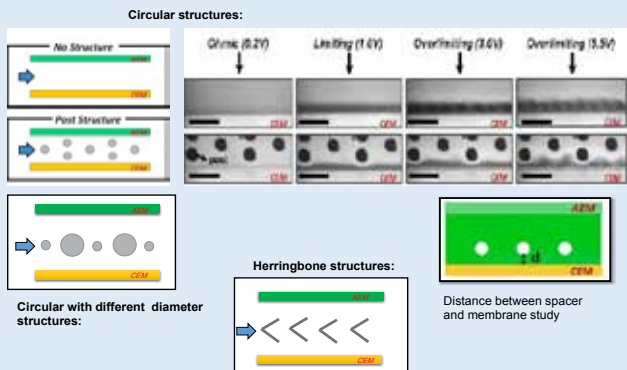
Treatment of high saline water has received very less attention worldwide. The oil and gas sector would require brine desalination techniques to reduce the use of fresh water for hydraulic fracturing, and also minimize wastewater disposal (Rassenfoss et al., 2011). In addition, discharge from seawater desalination plants from gulf coast countries are increasing salinity levels of the gulf, thereby posing long term environmental risks. This elevated salinity level and the amount of chemicals used to reduce biofouling could harm the marine environment of the relatively enclosed Arabian gulf sea. (Lattemann et al., 2008). Recent technology Reverse Osmosis is not energetically favorable in high saline brine conditions, and Mechanical Vapor Recompression (MVR), a technology used in produced water desalination, is not economical either. (Slutz et al., 2012). In this research we employ the principle of electro dialysis, the electrically-driven membrane desalination technology, to remove anion through anion exchange membrane (AEM) and cation through cation exchange membrane (CEM), and thus remove sodium and chloride ions from seawater. However, high saline desalination using electro dialysis is still under investigation. A closer look into the principle revealed better results if unipolar membrane system is employed. **Ion Concentration Polarization (ICP)** is a smart tweak over conventional Electro dialysis, that employs the use of unipolar membrane system, creating zones of desalted (clean) and concentrated (brine) zones within the membrane channel. The two flows can then be separated by introducing a fluidic split in the channel. The ion concentration polarization (ICP) utilizing CEMs can enhance salt removal ratio up to 20% compared to electro dialysis under constant current applied, along with other advantages compared with related electro dialysis technique. (Kim et al., in review).

Objectives

- In this work, we try to improve mass transport between the membranes by using spacer like structures.
- Difference structure types are being investigated for their role in mass transport, their current density, EPIR and salt removal capacities.
- In addition, distance between spacer and membrane is varied to know the effect.

Method- Simulation

Simulation results were obtained by solving the governing equations (Navier Stokes, Poisson-Nernst-Planck) numerically. (Numerical simulation as described in V.S.Pham et al, PRE,2012)

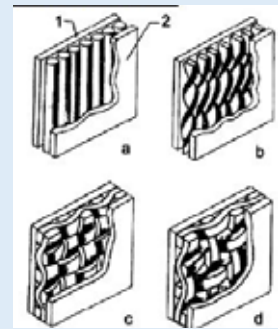
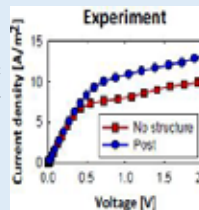
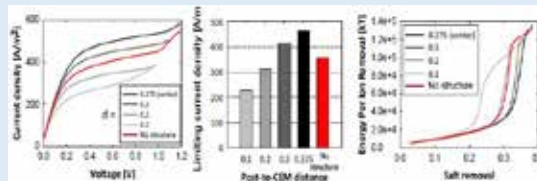


Results

As expected, structures improve the chemistry of ion exchange within the electro dialysis unit. As structures obstruct the flow path of the water, it creates necessary turbulence to restrict the formation of concentration polarization layers, and hence contributes to minimizing electrical resistance, and increasing the current flow.

The mass transport properties exhibit a dramatic twist when the distance between spacer and the CEM is incremented. Structures close to the CEM develop thicker ion depletion layers, that results in an increase in the local resistance. Slow flow near the CEM also results in a thicker concentration boundary layer.

Various other interesting combination of shape structures are shown to give interesting results. Herringbone structure is one such interesting structure worth experimenting on. (Shrivastava A et al, 2008)



Different ED spacer configurations as observed in literature. Shaposhnik et al, 2001



Herringbone spacer configurations as observed in literature. Shrivastava A, 2008

Conclusion

- Mass transport modulation is well explained by the help of simulation studies.
- Structures enhances turbulence in flow, and enhances mass transport.
- Distance from the membrane plays a key role in increasing current. Posts at half way from the membrane show high current density values.

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Stability and Dynamics of MSF – gPROMS Simulation

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Abstract

This study focuses on modeling the steady state and dynamic behavior of the multistage flash desalination process (MSF) using gPROMS. This modeling tool allows for simultaneous coding of the system dynamics and steady state performance. In addition, it allows the use of the most efficient solvers for a set of non-linear differential and algebraic equations describing the MSF process. The system model and analysis are based on actual plants data with different operating conditions. System's dynamic behavior is simulated by a step change in the input values of the main operating parameters, such as the feed flow rate and the top brine temperature. Finally, the analysis of model predictions for both steady-state operation and system dynamics have been compared to actual plant data, showing a good agreement between predicted and measured trends.

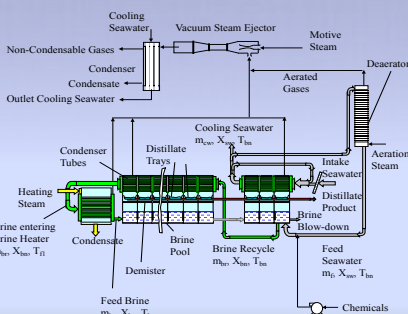
Introduction

In Kuwait and the GCC countries the MSF process accounts for 70% of all desalination processes. Although, the MSF process as well as the MED process consumes a larger amount of energy than the RO process, about 18 kWh/m³ for MSF, 15 kWh/m³ for MED, and 5 kWh/m³ for RO, but, the reliable performance of the thermal desalination processes MSF and MED made both processes highly competitive against the RO process [1]. Field reports show that the MSF plant life approaches 40 years. Several old units installed in 1970's and 1980's remain in operation and have been rehabilitated to continue operational for the next 10-20 years. At present the large MSF units with production capacity that ranges between 50,000-75,000 m³/d are being installed in several countries, including Kuwait, Saudi Arabia, and United Arab Emirates. The large increase in unit capacity contributes further to reduction in the unit product cost.

Objective

The aim of this work is to model MSF plant using gPROMS which allows for simultaneous coding of the system dynamics and steady state performance. gPROMS provides the most efficient solvers for a set of non-linear differential and algebraic equations describing the MSF process. The system model and analysis are based on real plant data. System's dynamic behavior is simulated by a step change in the input values of the main operating parameters, such as the feed flow rate and the top brine temperature.

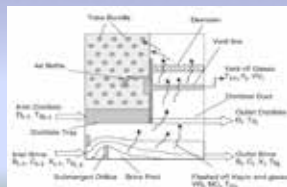
Multistage Flash Desalination with Brine Circulation



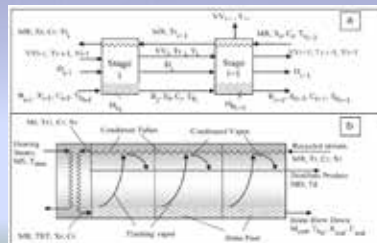
Mathematical model assumptions

The main assumption used in the present MSF dynamic model is related to the lumped parameter formulation for each phase within the stage, such as the flashing brine, the flashed-off vapor and the released non-condensable gases. In addition, it is assumed that heat losses to the surroundings are negligible. This is because estimates for the heat losses account for 2–5% of the total energy of the system [2,3]. Other assumptions include neglecting demister losses, accumulation in distillate tray, negligible content of non-condensable gases in distillate, and direct venting of non-condensable gases from each stage to the ejector. The dynamic model was constructed in a hierarchical structure. The lower level model includes the algebraic and differential equations which describe the mass and energy balance for individual phases in each flashing stage [4]. The higher level model includes the equations which related the flashing stages to each other to form the process model.

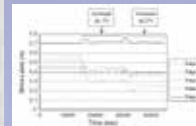
MSF Stage elements and Model Variables [4]



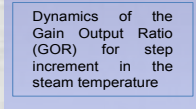
MSF Process Variables



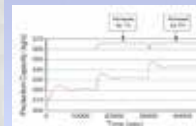
Results



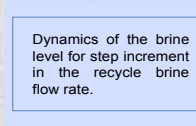
Dynamics of the brine level for step increment in the steam temperature



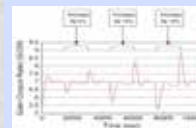
Dynamics of the Gain Output Ratio (GOR) for step increment in the steam temperature



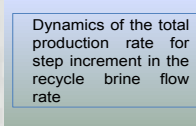
Dynamics of the total production rate for step increment in the steam Temperature.



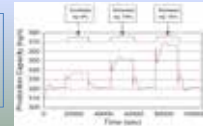
Dynamics of the brine level for step increment in the recycle brine flow rate.



Dynamics of the Gain Output Ratio (GOR) for step increment in the recycle brine flow rate



Dynamics of the total production rate for step increment in the recycle brine flow rate



Conclusion

1. Simulating the system dynamic response to various disturbances show that:
2. the change in the cooling water flow rate by $\pm 15\%$ almost has no effect on the plant performance.
3. The increase in the steam temperature cannot be more than 2% and the decrease cannot be more than 3% to avoid run away condition.
4. Changing in the recycle flow rate has a strong effect on the plant performance. It can be increased by 15% but cannot decrease by more than 7% because of run away conditions.

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CFD Modelling of the Demister in the MSF Desalination plant by Eulerian-Eulerian and Eulerian-Lagrangian methods

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Mathematical Model & Assumptions

1. The computational domain includes the vapor space below the demister, the demister, and the vapor space above the demister. The inlet flow is formed of water vapor together with brine droplets.
2. Steady state and transient model are used to model the droplet removal process.
3. Two dimensional domain in the direction of vapor flow and the traverse direction to the demister wires is used in the calculations.
4. Model assumptions include:
 1. incompressible vapor stream
 2. droplets are perfect spheres with uniform diameter
 3. no slip between the vapor phase and the droplets surface
 4. no interaction between individual droplets
 5. no vapor condensation takes place within the demister or the vapor spaces
 6. the brine droplet is assumed to vanish as soon as it reaches the wire surface
5. Models:
 1. Porous Media- Multi phase model (Eulerian-Eulerian)
 2. Tube banks -Multi phase model (Eulerian-Eulerian)
 3. Tube banks- Discrete phase model (Eulerian vapor – Lagrangian droplets) [5]

Abstract

Demisters are used to remove entrained brine droplets from flashed off vapor within the flashing stages of the multi stage flash desalination process (MSF). This is necessary to prevent accumulation of brine droplets on the outside surface of the condenser tubes and contamination of the desalinated water. The aim of this work is to design a new demister with lower pressure drop and unaffected separation efficiency which can be later installed in the flashing stages of the MSF plant and causes reduction in the required heat transfer area. In this work the demister performance is predicted as a function of design (wire diameter), and operating parameters (stage temperature). This objective was pursued through the use of commercial computational fluid dynamics (CFD) software. The wire mesh demister was modeled once as a tube bank and other as porous media and using two modeling approaches: Eulerian-Eulerian and Eulerian-Lagrangian method. The model was simulated using FLUENT code as was time dependent. It was validated against experimental and field data obtained from large scale MSF units. This work is the first in the literature to simulate the MSF demister using CFD modeling.

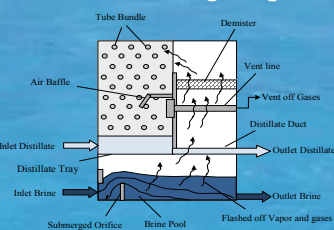
Introduction

Demisters are an essential element of the MSF process, which have been adopted by the industry in the early 1960's. Previously, no droplet removal devices were used and, as a result, fouling of the condenser tubes occurred at very rapid rate as well as frequent contamination of the distillate product [1]. Demister design and installation inside the flashing stage is poorly understood and is made through extensive trial and error steps. Review of the literature shows a small number of studies on demister modeling and analysis. More recently, a limited number of studies were found in the literature on demister modeling using computational fluid dynamics (CFD) [2,3].

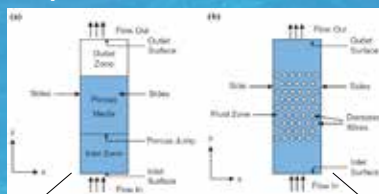
Objective

The aim of this work is to model the demister using two approaches: Eulerian-Eulerian and Eulerian-Lagrangian methods and validate against experimental and real plant data.

MSF Flashing Stage

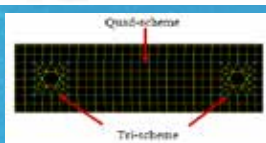


Computational Domain & Meshing

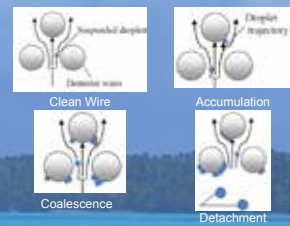


Porous Media Approach

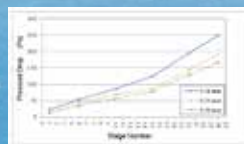
Tube bank Approach



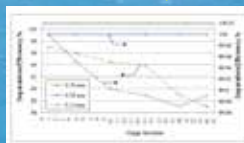
Brine Droplets Separation



Results

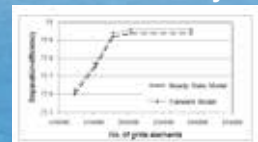


Effect of demister wire diameter on the demister pressure drop for stages 1, 5, 10, 15, 20, 24 in the MSF-BC plant.

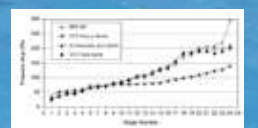


Effect of demister wire diameter on the demister separation efficiency for stages 1, 5, 10, 15, 20, 24 in the MSF-BC plant.

Grid Sensitivity



Results Validation



Conclusions

1. A demister was modeled using CFD tool (FLUENT) and validated against experimental data and real plant data.
2. New demisters with the same geometry but smaller wire diameter (0.24 and 0.20 mm instead of the standard 0.28 mm) were designed and modeled to predict their performance (pressure drop and separation efficiency).
3. The wire diameter of 0.24 mm was selected because it reduces the pressure drop without significantly affecting the separation efficiency.
4. This model provides an inexpensive tool to simulate and troubleshoot existing demisters and to design new demisters.

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Eulerian-Eulerian CFD modeling of MSF Demisters

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Abstract

This study focuses on the development of design correlation for pressure drop in wire mesh demisters, used in the multistage flash desalination process (MSF) as well as similar evaporation and flashing units found in other industrial processes. Development of the correlation is based on numerical simulation of the demister using steady-state and two-dimensional model for the flow of vapor and brine droplets through the demister. An Eulerian model was used to model the system and the resulting model equations were solved using a commercial computational fluid dynamics software (FLUENT). A sensitivity analysis of the model revealed that vapor velocity, demister packing density and height, and the inlet flashed-off vapor composition are the main parameters that affect demister performance. Consequently, numerical data were used to correlate pressure drop across the demister as a function of operating and design parameters. The developed correlation was validated using data from real MSF plants. Analysis indicated that the correlation predictions and experimental data were consistent and showed good agreement with an error less than 25%.

Introduction

1. Demisters are used for removal of entrained brine droplets from flashed off vapor.
2. Demisters prevent accumulation of brine droplets on the outside surface of the condenser tubes, contamination of the desalinated water, and increase temperature drop in the vapor stream.
3. The first two factors affect operating cost and the last factor increases the process capital cost.

Objective

The aim of this work is to perform an Eulerian-Eulerian model to perform the sensitivity analysis of demister performance to study the effects of major operating/design parameters such as vapor velocity, packing density, inlet droplet fraction, and face permeability on the pressure drop across the wire mesh demister using FLUENT [1]. Also a new correlation for the pressure drop across the demister is predicted, compared against other correlation, and validated against real plant data and experimental data.

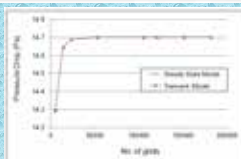
Mathematical Model & Assumptions

1. The system model was formed of three zones, which include the vapor space above and below the demister and the demister. In addition, the demister was approximated as a porous media [2].
2. Two dimensional domain in the direction of vapor flow and the traverse direction to the demister wires is used in the calculations.
3. Model assumptions include:
 - a. Vapor and brine droplets are modeled by the Eulerian method. This approach models both phases as two separate continuums.
 - b. The demister is modeled as a porous media. This is because the MSF wire mesh demisters have a porosity varying between 80 and 99% and the demister has a uniform distribution of void and wire volumes.
 - c. Two dimensional approximation for the demister (x and y directions). The flow is assumed to be symmetric in the z-direction (which is much larger than the x and y dimensions).

Results

Grid Analysis

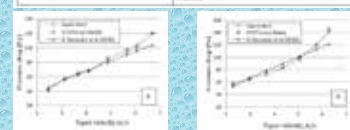
Parameter	Value	Parameter	Value
Vapor velocity (m/s)	2.5	Temperature (K)	313.15
Packing density (kg/m ³)	80.317	Pressure (Pa)	101325
Water droplet volume fraction (vol.%)	0.01	Temperature (K)	313.15
Water droplet volume fraction (vol.%)	0.01	Pressure (Pa)	101325
Temperature (K)	313.15	Pressure (Pa)	101325
Pressure (Pa)	101325	Temperature (K)	313.15



Pressure drop values obtained for the porous media geometry with varying number of grid elements.

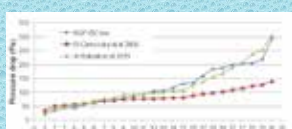
Model Validation

Parameter	Value
Vapor velocity (m/s)	11.13-12
Packing density (kg/m ³)	80.317-140.6
Water droplet volume fraction (vol.%)	4.8E-7-3.8E-6
Temperature (K)	313.15
Pressure (Pa)	101325

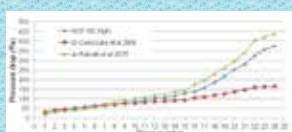


Variation in pressure drop as a function of vapor velocity for a demister with a wire diameter = 0.28 mm and packing density of (a) 80.317 kg/m³, (b) 140.6 kg/m³

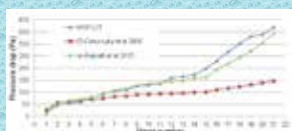
Model Validation



Variation in pressure drop across the demister (packing density 80.317 kg/m³) for MSF-BC (Low Temperature).

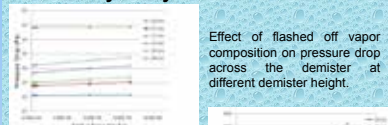


Variation in pressure drop across the demister (packing density 80.317 kg/m³) for MSF-BC (High Temperature).

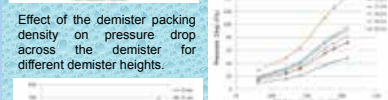


Variation in pressure drop across the demister (packing density 80.317 kg/m³) for MSF-OT.

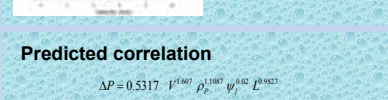
Sensitivity Analysis



Effect of flashed off vapor composition on pressure drop across the demister at different demister heights.



Effect of the demister packing density on pressure drop across the demister for different demister heights.



Effect of flashed off vapor velocity on pressure drop across the demister for different demister heights.

Predicted correlation

$$\Delta P = 0.5317 V^{1.1007} D_p^{1.1887} \psi_i^{0.82} L^{0.9823}$$

- V is the flashed-off vapor velocity and ranges between (1.2 and 12.5) m/s
- D_p is the packing density and ranges between (80 and 209 kg/m³).
- ψ_i is the inlet volume fraction of brine droplets and ranges between (4E-7 and 6.5E-6).
- L is the demister height and ranges between (0.1 and 0.3 m).

Conclusions

1. This correlation can be used to simulate pressure drop in demisters over a wide range of design and operating parameters.
2. Results for the pressure/temperature drop are essential for design of other parts of the plant (condenser tubes and venting) and for assessment of product quality.
3. Use of the correlation is not suitable for the design of new demisters because the model requires prior knowledge of the demister separation efficiency.

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Analysis of the Efficacy of a Single Screw Extruder to Synthesize di and tri Component Polyester Blends

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Chemical Engineering Department, Kuwait University



Abstract

Tri component of neat poly(ethylene terephthalate) (PET), poly(butylene terephthalate) (PBT) and neat acrylonitrile butadiene styrene (ABS) were melt blended over the different composition ranges using a single screw extruder. Different possible combinations of di and tri component polyester/polyester (PET/PBT) and polyester/polyester/elastomer (PET/PBT/ABS) blends were synthesized using acrylonitrile butadiene styrene grafted maleic anhydride (ABS-g-MAH) as the compatibilizer. Di component blends of PET/ABS & PBT/ABS were also synthesized. The ABS fraction in all studies was kept constant at ten weight percent. The rheological, mechanical and thermal behavior of all the neat polyesters, ABS and the di and tri component blends were investigated.

Introduction

Engineering plastics are polymers that possess a combination of good physical, chemical and mechanical characteristics and can be applied over wide range of applications. Engineering plastics can be used instead of metals and ceramics and their use has increased on a daily basis. However, it is important to note that individual engineering plastics do not meet the requirements for every application. Development of new polymer blends would help to reduce the cost involved in the development of new polymeric materials. Polymer blending is a main field of research and development due to its potential in acknowledging industrialized societies. The importance of polymer blending is increasing at a rapid rate due to the fact that the blends are tailored to meet the requirements of certain prominent applications. The properties of the blend system depend on individual components and hence it is easy to meet the standards required by new markets in terms of the cost and performance [Park et al., (2001)]. Recent data reveals that polymer blends constitute 30-40% of the total polymer consumption and the percentage is found to increase by 9% in the past 12 years [M. Zhang et al., (2003)]. Blending of polymers provides an opportunity to reduce the costs involved without sacrificing the end properties, permits rapid developments in modifying the polymers such that it meets the up-coming needs of the consumers and also improves the processability of the unique materials that have been developed [Mark et al., (1990)]. With today's advancement in polymer blends, it is found that 65% of the polymer blends and alloys are produced by manufacturers, 25% by large compounding companies and the rest by small scale polymer industries. Blending of polymers has many advantages, such as; reduction of polymeric scrap, product identity, ease of processability, decrease storage space, provides new materials with similar properties as parent material and improves the morphology and mechanical properties [Utracki, 1990]. Blends of plastic materials are especially used in the automotive and electronics industry in order to develop a thermoplastic blend with improved mechanical properties such as strength, toughness, etc.

Methods

Polybutylene terephthalate (PBT) was purchased from Century Enka Pvt Ltd, Pune, India. It had number average molecular weight, M_n and weight average molecular weight, M_w , of 38,260, 29,400 g/mol and intrinsic viscosity of 0.56 dl/g, respectively. It contained 0.063 equivalents of hydroxyl groups and 0.041 equivalents of carboxylic groups as chain ends. Commercial grade polyethylene terephthalate (PET) with weight average molecular weight of 38,000 g/mol and an intrinsic viscosity of 0.6 dl/g was purchased from Century Enka Pvt Ltd, Pune, India. The Acrylonitrile butadiene styrene (ABS) used was supplied by a local chemical company in Kuwait. It had a composition of 40% rubber and 25% acrylonitrile (AN). The M_n was 59,000 g/mol and M_w was 140,000 g/mol.

Preparation of Compatibilizer (ABS-g-MAH)

2.5g of maleic anhydride (MAH) was dissolved in 50 ml of acetone. It was then poured on to ABS (25 g), stirred well to make it a homogenous coating and dried in a fume hood at room temperature for 16 hours. The dried ABS coated with MAH was extruded using a single screw extruder and pelletized. The ABS grafted with MAH (ABS-g-MAH) was stored in sealed plastic bags and used whenever required.

Blend preparation

PET, PBT and ABS were dried at 100 °C for 8 h in a vacuum oven to minimize the hydrolytic degradation of the melts. All of the components were thoroughly mixed prior to extrusion. The blend development involved the synthesis of di component blends of PET/PBT. The concentration of ABS-g-MAH used was 5 wt/wt %. The first step consisted of hand mixing of PET and PBT with the compatibilizer (for compatibilized reactions). The time period for mixing was 15 minutes, at room temperature. PET/PBT blends of different compositions were synthesized using a 35-mm single-screw extruder (Collin-Teachline, Germany). The parallel zone temperatures were 245 to 260 °C and the screw speed was kept at 50 rpm. Di component blends of PET 90/ABS 10 and PBT 90/ABS 10 were also synthesized under similar conditions using the single screw extruder.

For the synthesis of tri component blends, 10 weight percent ABS (kept constant for all experiments) was added to the di component blends of PET/PBT and extruded using the single screw extruder under similar conditions maintained for the di component blends. All the di and tri component blends were extruded under identical processing conditions like processing temperature, screw speed and molding pressure. The di and tri component blends were extruded in the form of strands, cooled in a water bath and pelletized. The extruded pellets were then dried in an oven at 110 °C for 8 hours to remove the moisture and molded into standard ASTM test specimens by using a Thermo-Haake Minijet injection-molding machine, to obtain 2 mm thick and 25 mm diameter circular discs for analysis of rheology or dumb bell shaped bars for mechanical analysis. For mechanical tests the specimens were prepared as per ASTM D638 standard.

Mechanical properties

Mechanical tests were carried out using a Tinius Olsen Universal Testing Machine (Model H100K-T, UK) Figure (2.4) having a 1-kN cell, at a cross-head speed of 1 cm/min and gauge length of 2.225 cm, according to ASTM D638 standard. The samples for the mechanical studies were prepared using a Thermo-Haake minijet injection molding machine. The pelletized samples were injection molded at 260 °C at a pressure of 500 bars. The dumb bell shaped bars were then stored in desiccators to prevent moisture absorption, till the mechanical analysis was conducted.

Rheological properties

Böhm rheometer (Malvern instruments) was used to study the melt rheology of the neat polymers and the di and tri component blends. Figure (4 & 5) depicts a picture of the rheometer which impulse a parallel plate of the diameter of 25 mm and working temperature of 260 °C. Thermo-Haake Minijet injection molding machine was used to prepare the rheological samples. The shear rate was varied between 1 to 100 s⁻¹. With a small amplitude oscillatory shear, the dynamic and frequency measurements were obtained in the linear viscoelastic region. Before the measurement carried out, the gap between the cone and the plate of the rheometer was kept at 1.55 mm at temperature of 260 °C. The accuracy for gap width was kept below 1 m and the error in cone and plate temperature was found to be in the range 1 °C. Shear viscosity as a function of a shear rate was determined for all samples using a steady rate sweep test.

Results

Mechanical properties

As seen in Figure1, the tensile force required to break the homopolymer PET is found to be greater than that of PBT. This is due to the fact that PBT has a longer alkyl chain compared to PET. A decrease in the tensile strength values is noted in the di-component system, but these values are found to be higher than that of the tri component blends. The tri component blends shown in Figure 3.17 indicates that with the increasing PBT concentration, the tensile strength is found to decrease. The absence of PBT in PET 90/ABS 10 improves its tensile strength compared to neat PET. This could be due to the inherent excellent tensile property of PET.

Figure 2 shows that the tensile modulus of neat PET is higher than that of neat PBT, which implies that PET is stiffer than PBT or it is more resistant to deformation. For the di component blends it is noted that the tensile modulus values decrease as the PBT percentage increases. This could be due to the poor elastic characteristics (elongational property) of PBT. With regard to the tri component blends it is seen that the tensile modulus values of these systems are lower than the di component blends. This could possibly be due to the fact that the elastic characteristics of ABS are poorly exhibited in the tri component system due to poor mixing in a single screw extruder.

Rheology

Figure 3 indicates the storage modulus versus frequency plots for PET, PBT, ABS and their di and tri component blends. As seen in Figure 3 the values of neat ABS is sandwiched between PET and PBT. ABS is tri component polymer containing acrylonitrile, butadiene and styrene. The molecular weight characteristics of ABS depend on the ratio of each constituent present in ABS. It is also seen from Figure 3 that the G' value of the di component blends containing maximum amount of PET lies below the neat polymers. The tri component blends have lower G' values compared to the di component blends containing ABS. As seen in Figure 3, the difference if the G' values between the di and tri component blends can be due to the poor mixing ability of the single screw extruder, lack of its positive conveying characteristics and limited mixing homogenizing capabilities. The low values of G' noted for the di and tri component blends compared to the neat polyesters and ABS can also be attributed to the interfacial tension effect in the melt state.

Figure 4 is a plot indicating variation of G'' as a function of frequency for PET, ABS, PBT and di- and tri-component blends containing 10 weight percentage of ABS. In these Figures it is noted that the tri-component blends containing ABS have lower G'' values compared to the di-component blends containing 10 weight percent of ABS. It is also noted in Figure 4 that the compatibilized blends have a higher G'' values compared to the uncompatibilized blends containing ABS.

In the tri component system, greater disorder seems to exist because of more number of components, leading to a poor network structure which causes a decrease in the storage and loss modulus values of tri-component blends compared to the neat polymers. It can also be mentioned that tri component blends have lower G' and G'' values compared to di component systems (both compatibilized and uncompatibilized), which could be due to the inefficiency of the single screw extruder.

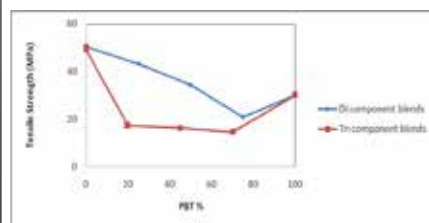


Figure 1

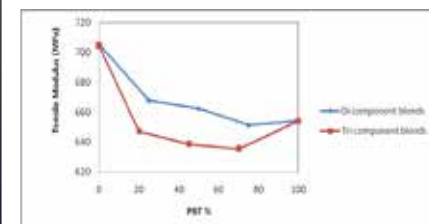


Figure 2

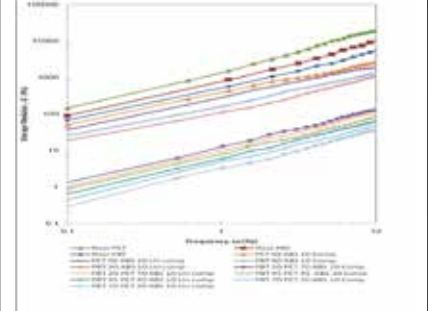


Figure 3

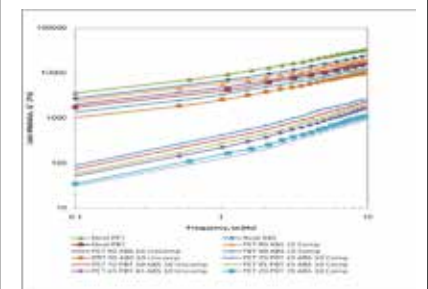


Figure 4

In the entire study on G' and G'' of the neat polymers and compatibilized and uncompatibilized di and tri component blends it was noted that the G' and G'' of neat polymers were higher and all the samples had an increasing trend with increasing frequency. This is due to the fact that at low frequency, time is large enough for unraveling of the entanglements so a large amount of relaxation occurs resulting in a low value of storage and loss modulus at low frequencies.

However when a polymer sample is deformed at large frequency the entanglement chains do not have time to relax, so the modulus goes up [Mishra, J. K. et al., (2005)].

Conclusions

Tri component blends of neat PET, PBT and ABS were synthesized by varying the weight percentages of PET and PBT and keeping a constant concentration (10 weight percent) of ABS. Di component blends of different polyesters (PET/PBT), PBT/ABS and PET/ABS, having different weight percentages were also developed. These di and tri component blends were synthesized under the same processing conditions, wherein the samples experienced the same processing temperature and pressure, same shearing speed, pelletization and drying conditions.

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A Baseline Study for Municipal Solid Waste Characterization for the State of Kuwait

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Abstract

This paper provides an up-to-date reference line for municipal solid waste characterization for the state of Kuwait. The baseline data was collected in accordance to the Standard Test Method for the Determination of the Composition of Unprocessed Municipal Solid Waste (ASTM). Detailed waste stream surveys were conducted to municipal solid waste (MSW) truckloads totalling over six hundred samples that were mixed, coned quartered then sorted. Waste categories covered paper, corrugated, PET bottles, film, organic, wood, metal, glass and others. Analysis of variance (ANOVA) was used to investigate seasonal influence on waste composition. The results demonstrated a significant seasonal variation in almost all waste categories. In addition, a statistical comparison was conducted with respect to the established national waste composition baseline of 1995. Tests were applied using the 95% confidence level depicted significance difference from the 1995 baseline. An up-to-date, well-informed solid waste characterization is an essential step towards prescribing suitable integrated waste management solutions for ever increasing waste generation rates.

Introduction

Municipal solid waste (MSW) characterization is first step towards achieving an Integrated Solid Waste Management Systems that is efficient in prevention, minimization, recovery of ever increasing MSW (Magrinho et al., 2006; Metin et al., 2003). A waste characterization study provides quantification analysis of waste components. The output is the weight and the composition of the various waste fractions (Dahlen et al., 2007). Generation rates and characteristics of the MSW are directly related to the economic status of the country. For instance, MSW in developing countries is rich with degradable material, while in developed countries, the recyclables (paper, plastic, glass, metal, etc.) constitutes the larger portion (Shekdar, 2009). The MSW generation rate and composition are also influenced by other factors such as geographical and cultural conditions, population, and socio-cultural properties (Akinci et al., 2012).

Objective

This study objectives are three folds to: conduct an up-to-date characterization of the MSW for the state of Kuwait, to investigate whether any significant changes has occurred to the previously established national baseline for waste characterization, and conduct statistical analysis of source of variation if any with respect to seasons and governorates.

Methodology

Raw MSW is sorted into individual components and weighed. Then, statistical analysis was performed to determine mean, standard deviation and confidence level information. The seventh ring road waste dumping site was selected for the waste characterization survey as it covers the vast majority of residential districts. The characterization study was performed during both summer and winter seasons. To achieve adequate confidence levels and satisfy statistical data analysis requirements, over ninety MSW truck loads were thoroughly characterized. Of which, thirty seven trucks were studied for summer and the same for winter seasons, while seventeen trucks were investigated during the holiday season. The sorting was conducted on an average of five trucks per day by six workers and an inspector. The ASTM D5231-92 method was used for the waste characterization.

Data Collection

Table 2: Total descriptive statistics classified by category and season

Waste	Season	Mean (%)	S (%)	S ²	Median (%)	Min (%)	Max (%)	Q1 (%)	Q3 (%)	N	Overall
Sanitary	Summer	6.016	2.169	4.7	5.96	0.7	12.62	4.52	6.77	37	6.23%
	Winter	6.639	2.01	4.02	6.09	3.81	11.82	5.025	8.4	37	
Paper	Summer	6.401	2.79	7.76	6.55	0	12.37	4.45	8.13	37	6.67%
	Winter	7.213	1.84	3.376	7.14	3.96	10.48	5.8	8.63	37	
Corrugated Fiber	Summer	7.75	2.66	7.083	7.74	1.24	14.11	5.51	9.41	37	8.40%
	Winter	9.674	1.91	3.64	9.68	5.31	13.27	7.87	11.22	37	
PET Bottles	Summer	5.97	1.964	3.856	5.64	2.68	10.92	4.76	6.84	37	6.87%
	Winter	8.64	1.81	3.28	8.33	5.56	13.53	7.585	9.84	37	
Film	Summer	11.68	3.71	13.75	11.36	5.17	22.41	9.28	14.11	37	11.25%
	Winter	10.4	2.032	4.13	10.53	6.67	16.67	8.79	11.8	37	
Organic	Summer	49.44	7.973	63.57	50	10.37	57.08	48.15	54.13	37	45.79%
	Winter	38.6	4.082	16.66	38.61	30.61	47.62	36.58	41.72	37	
Metals	Summer	2.766	1.392	1.937	2.56	0.83	6.99	1.72	3.93	37	3.95%
	Winter	6.285	1.768	3.125	5.61	3.54	10.2	5	7.23	37	
Glass	Summer	5.61	1.818	3.305	5.2	2.91	9.94	4.21	6.88	37	6.09%
	Winter	7.029	1.932	3.732	6.93	3.33	13.27	5.97	7.83	37	
Wood	Summer	2.963	1.741	3.03	2.8	0	8.42	1.82	3.53	37	3.82%
	Winter	5.513	1.97	3.87	4.95	1.9	10.62	4.33	6.67	37	

Effect of Seasonal variation on solid waste composition

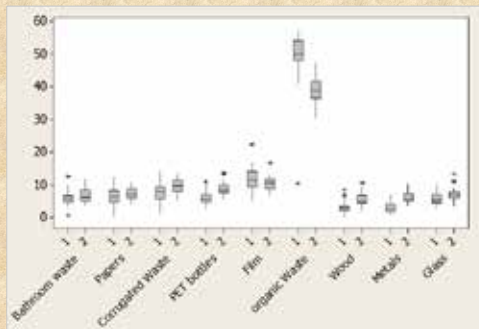


Figure 1: Box plots displaying the MSW composition percentile with respect to season: summer (1) and winter (2)

Comparing MSW composition to 1995 baseline

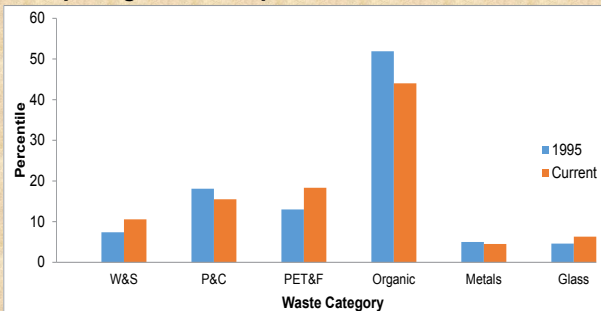


Figure 2: The differences in the current waste composition to a 1995 baseline.

Conclusions and Recommendations

- The results of the study indicate that the organic waste is dominant (44.4 %) followed by film (11.2 %), then, corrugated waste (8.6 %).
- Hypotheses tests were conducted to compare municipal waste composition among seasons proved that season is relevant. Summer season had higher organic waste proportion, whereas winter produced higher waste ratios with respect to corrugated waste, PET bottles, wood, metal and glass.
- Statistical comparison with a previously published waste characterization baseline showed an interesting phenomenon; all waste categories proportions have changed except for only metal waste percentile. This crucial modification in waste composition dictates a new trend in population life style, which needs to be considered when planning future waste treatment scenarios that are fit to need.
- Up-to-date waste characterization of the municipal solid found indispensable towards establishing a well-designed integrated waste management system.

Acknowledgment

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GREYWATER COLLECTION AND REUSE AT SCHOOLS IN THE STATE OF KUWAIT

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Abstract

Greywater is that portion of untreated domestic wastewater that has not come into contact with toilet water, thus it is less polluted. Survey of schools of different education levels (primary, intermediate and secondary) in Kuwait showed an average greywater generation rate of 7.3 L/p/d and varied in the range of 2.9 – 16 L/p/d, reflecting the school level of education (i.e. student age). The highest rates were observed for primary schools while the lowest rates were observed in secondary schools where students are more mature and use the water more wisely. The greywater characteristics indicated waste with low COD and BOD values but has relatively high solids, conductivity, and sodium content due to excessive use of hand soap. Total Coliform values ranged between 89 and 352 MPN /ml with an average of 196 MPN /ml while no Fecal Coliform values were detected. Greywater collected from schools is classified as light greywater and contains much lower levels of organic matter and nutrients compared to residential greywater and domestic wastewater. It is suitable for non-potable reuse after minimal treatment since microbial contamination may pose a serious threat to health if greywater comes into contact with humans. It also provides a good opportunity for reuse in toilet flushing since it can be easily collected from wash sinks and fountains, as major sources, then treated and recycled. Treatment options were studied to select the best treatment system for schools.

A pilot greywater treatment plant was developed and tested. It includes screening, filtration, chlorination, and UV disinfection. Different flow rates, chlorine dosages, and treatment schemes were studied. The results show that sand filtration operated at low rates is very effective in solids removal. For reduction of COD, BOD, and total coliform concentrations, UV proved to be more effective than chlorination (5 and 10 mg/l chlorine dosages) thus recommended for removal of organics and disinfection of greywater collected from schools. A schematic design and capital cost of a 50 m³/d treatment system comprising screening, sand filtration and UV disinfection (Fig. 1) was provided at a low cost of 2000 KD and was successfully tested for reuse of greywater at schools in Kuwait, thus achieving 40% savings in water consumption by schools.

Introduction

Greywater includes water from showers, bathtubs, bathroom sinks, washing machines, and drinking fountains. It does not include heavily soiled water from toilets, bidets, and urinals known as black water which contains organic matter. Increasing demand for fresh water and scarcity of water resources in arid and semi-arid regions have created an urgent need for alternative water resources and optimization of water use through reuse options. Greywater can replace fresh water in many instances, thus reducing the demand on good quality potable water supplies and increasing the effective fresh water supply in regions where irrigation is needed. Reuse of greywater is therefore supported and encouraged by many governments worldwide to help conserve water. Different systems are available to collect, treat and recycle greywater. A simple system is the best option if it could be ecological friendly, take little material to construct, and require minimal energy to operate.

Conclusions and Recommendations

- Greywater generation in the surveyed schools ranged between 2.9–16 L/p/d, with an average of 7.3 L/p/d, and reflected the school level of education (i.e. student age). The highest rates were observed in primary schools while the lowest rates were observed in secondary schools where students are older and use the water more wisely.
- The school greywater characteristics differ from those of residential greywater but lie within the range of light greywater quality. They indicate a waste with low BOD and COD values and have relatively high solids, conductivity, and sodium content due to excessive use of hand soap.
- The greywater is suitable for non-potable reuse but requires a minimum degree of treatment before reuse in various applications within the schools. Such treatment was developed at a minimal cost using screening, sand filtration and disinfection comparing UV and chlorination. A pilot plant tested at different flow rates showed optimum filtration rates in the range of 15 to 20 m³/d.m² and is recommended to achieve SS removal of 60%, COD removal of 30% and BOD removal of 15%. Additional COD and BOD removal efficiency of up to 70% and considerable reduction of total coliform could be achieved by UV or chlorination (chlorine dosage 10 mg/L).
- The treated greywater satisfies water quality requirements and is hygienically safe for reuse at schools. Greywater could be easily collected from wash sinks and fountains, as major sources, and the treated effluent would be recycled for landscape irrigation and toilet flushing at a cost of 30 Fils /m³, and would result in 40% savings in water consumption by schools.



Fig.1. Greywater treatment plant for schools



Fig.2. Greywater collection at schools

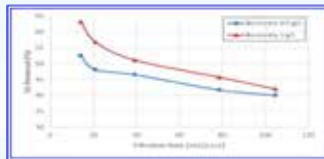


Fig.3. Effect of filtration rate on solids removal

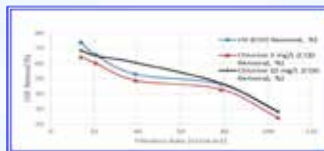


Fig.4. Effect of filtration rate on COD removal during disinfection

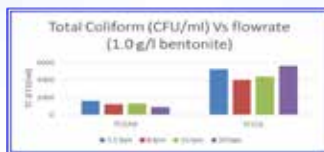


Fig.5. Effect of flow rate on total coliform reduction by UV and chlorine

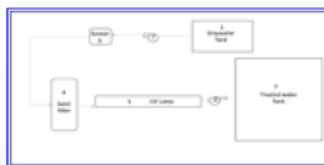


Fig.6. Proposed scheme of greywater treatment at schools

Objectives

This study was conducted in order to determine the quantities and characteristics of greywater collected from schools in Kuwait as well as to develop a mobile treatment plant for use by schools to treat greywater generated daily at a minimal cost.

Methodology

The study was performed in three phases. In Phase 1, a survey was conducted on seven schools selected to represent different levels of schooling, gender and number of students. A greywater collection system was installed on the drains of wash sinks in washrooms at each school (Figure 2). In each case, greywater was let to travel down into the drain on which a flow meter was installed and the greywater samples were collected during four months. The quantities of greywater generated in each school were determined and the characteristics of collected samples were analyzed following standard methods. In Phase 2, physical and chemical treatment methods were examined in the laboratory using real or synthetic greywater. The treated water quality was compared with the criteria of water used in irrigation set by Kuwait Environment Public Authority. In phase 3, a pilot treatment plant was developed and tested at different flow rates using greywater from schools, and capital cost of the plant was determined for potential use by schools in Kuwait.

Results

Table1. Quantities of greywater generated at schools

No	School name	School level	Students Gender	No. of students	Greywater generation rate (L/p/d)	Greywater generation rate (L/s)
1	Al-Khail Bin Ahmad	intermediate	boys	500	4.0	2000
2	Abubilla	primary	girls	424	10.6	4984.4
3	Al-Mu'amoon	primary	boys	317	16	5072
4	Nasla	intermediate	girls	377	4.8	1809.6
5	Hamad area Al-regaybi	secondary	boys	307	2.9	1111.3
6	Al-Jazir	secondary	girls	416	3.2	1331.2
7	Gumata	intermediate	girls	328	9.6	2476.8

Table 2. Characteristics of greywater generated at schools

Parameter	unit	mean	maximum	minimum	Standard deviation
pH	-	8.01	8.09	7.94	0.07
Temperature	°C	25.00	26.00	24.00	0.85
Total suspended solids	mg/l	2146	3463	653	551
Total Solids	mg/l	905	1063	540	209
Total Chloride	mg/l	107	163.4	59	26
TSS	mg/l	5.97	9.63	3.18	2.67
BOD	mg/l	6.0	17.0	0.0	6.0
COD	mg/l	148.74	242.0	44.0	57.0
Chloride	mg/l	1.03	1.52	0.50	0.47
Conductivity	mg/l	101.4	141.4	2.0	31
Total Phosphate	mg/l	0.001	0.004	0.000	0.001
UV ₂₅₄	mg/l	0.001	0.001	0.000	0.000
Chlorophyll	mg/l	177	1600	460	517
Ammonia Nitrogen	mg/l	0.00	0.00	0.00	0.00
Ammonia Nitrate	mg/l	4.0	10.0	0.0	4.0
Ammonia	mg/l	0.00	0.00	0.00	0.00
Total coliform	mg/l	196	352	89	89
Fecal coliform	mg/l	0	0	0	0
Total Coliform	mg/l	0	0	0	0

Table 3. Quality of greywater after consecutive treatments

PARAMETERS (mg/l)	GREYWATER	SCREEN	SAND FILTER	UV	CHLORINE
Total Solids (mg/l)	178	126	80	200	246
Total suspended solids (mg/l)	402	286	191	160	164
TSS (mg/l) Conductance	178	180	178	180	182
COD (mg/l)	134.4	114.4	102.4	38.4	54.4
BOD (mg/l)	46	34	32	20	21
Chloride (mg/l)	49.8	49.6	49.6	48.92	52.72
Sulfate (mg/l)	25	25	20	19	11
Nitrate (mg/l)	0.0	0.0	0.0	0.0	0.0
Nitrite (mg/l)	0.006	0.001	0.000	0.000	0.000
Ammonia (mg/l)	17.9	58.9	57.0	17.1	48.5
Total Coliform (CFU/ml)	3210 ²	1610 ²	2810 ²	1610 ²	2010 ²

Table 4. Capital cost of proposed treatment plant with flow rate 50 m³/day

Item	Cost (KWD)
Steel frame	200
Screen filter	125
Sand filter	300
UV unit	265
Panel	350
Pumps & Remote controller	200
Electrical wiring	50
Control panel + electrical works	400
Manufacture for system assembly + pipes and valves	2000
Total	3090

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Design and Analysis of a Band Notched Staircase Ultra Wide Band Antenna

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Abstract

A compact Ultra-wideband planar monopole antenna with a notched band at WLAN frequencies is presented. The antenna is fed using a finite ground coplanar waveguide and has a structure consisting of stair-shaped radiator and ground plane. The notched band is implemented by cutting two symmetrical narrow slits from the ground plane. The antenna is fabricated on a substrate with a dielectric constant of 4.4 and has a compact size of $18 \times 26 \times 1.6$ mm³. Experimental and simulation results of the fabricated antenna are found to be in good agreement. The antenna achieves an average gain of 3 dBi and efficiency of more than 80% over the operational band. Time domain analysis, which includes the group delay response and fidelity calculation, implies that minimal distortion is introduced by the proposed antenna which makes it suitable for portable pulsed UWB systems.

Introduction

Ultra-wideband (UWB) systems are allocated a shared unlicensed band between 3.1-10.6 GHz [1]. In other words, the bandwidth used by these systems is 7.5 GHz which is the largest bandwidth allocated for any commercial use thus far. However, the allocated band for UWB systems is shared with existing narrowband systems. The interference between UWB antennas with these systems can be eliminated by using a notch filter tuned to the required frequency band. However, adding filters would increase the complexity. An alternative method is the use of band-notched antennas where a number of frequency bands are attenuated out of the UWB spectrum.

An UWB antenna with band notch characteristics is mostly constructed by combining a regular UWB antenna with a band-stop resonant structure. To create the notch characteristics, two factors regarding the resonant structure to be used are considered, and these are the type and location. The resonator types that are usually used are the slot, microstrip, CPW, and metamaterial resonators.

Consumer products that require UWB antennas are usually designed to be small in size. This fact implies that UWB antennas used in such products must be compact. For planar band-notched UWB antennas, miniaturization can be achieved in two steps. The first step is to employ the techniques used in miniaturizing the UWB antenna itself. The second step is to miniaturize the resonators often used to achieve the band-notched characteristics.

In this paper, a compact band notched stair case UWB antenna is developed. The evolution of the antenna from a finite ground coplanar waveguide (FGCPW)-fed strip monopole is presented in detail. The reflection coefficient, surface current and the radiation patterns of the antenna are simulated and analyzed. The antenna is fabricated, and measurements have been conducted to verify that the performance of the fabricated antenna agrees well with the simulated results. Transient analysis of the antenna is conducted to understand and estimate the pulse handling capability of the antenna.

Geometry of the Band Notched Staircase Ultra Wide Band Antenna

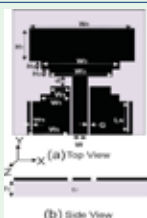


Fig. 1 Geometry of the proposed band notched staircase shaped UWB antenna.

The staircase shaped band notched UWB antenna is shown in Fig. 1. It is fed using a FGCPW, and both the radiator and the ground are staircase-shaped. On the ground plane, two thin narrow slits are inserted. The parameters of the antenna are given by $W_1 = 18$ mm, $W_2 = 15$ mm, $W_3 = 12$ mm, $W_4 = 4.15$ mm, $W_5 = 5.65$ mm, $W_6 = 7.15$ mm, $H_1 = 8$ mm, $H_2 = 2$ mm, $H_3 = 2$ mm, $d = 2$ mm, $L_1 = 7$ mm, and $L_2 = 0.3$ mm, $h = 1.6$ mm and $\epsilon_r = 4.4$.

Evolution of the antenna

The FGCPW-fed strip monopole antenna (Antenna 1) is shown in Fig. 2 (a). Top loading Antenna 1 with a rectangle of same length and width results in the antenna shown in Fig. 2 (b) (Antenna 2). UWB antenna is obtained by making steps both on the ground plane and the radiating element resulting in Fig. 2 (c) (Antenna 3). Finally inserting thin narrow slits on the ground plane results in the band notched UWB antenna (Antenna 4) and is given in Fig. 2 (d). The simulated reflection coefficients of the four antennas are shown in Fig. 3.



Fig. 2 Evolution of the band notched staircase shaped UWB monopole antenna. (a) FGCPW-fed strip monopole antenna. (b) Top loaded monopole antenna. (c) Staircase shaped UWB monopole antenna. (d) Band notched staircase shaped UWB antenna.

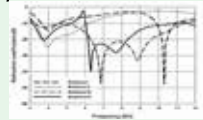


Fig. 3 Simulated reflection coefficients of four antennas of Fig. 2.

Fabrication and Results

The antennas are made on FR4 epoxy substrate having dielectric constant (ϵ_r) of 4.4, and thickness (h) of 1.6 mm. Fig. 4(a) shows the photograph of the antenna. Fig. 4 (b) gives a comparison between measured and simulated reflection coefficients of the antenna. A -10dB bandwidth from 3.1 GHz to 11.5 GHz with resonances at 3.8 GHz, 6.2 GHz, and 7.8 GHz is measured. In addition a notch band from 5.04- 6 GHz is also obtained. The measured and simulated results are in good agreement. Measurements plot of the gain of the band notched staircase shaped antenna is shown in Fig. 5 (a). An average gain of 3dBi is noted over the entire operating band. A reduction in gain greater than 5dB is obtained for the band notched staircase shaped UWB antenna. The antenna radiation efficiency measurement is shown in Fig. 5 (b). Radiation efficiency greater than 80% is obtained in the pass band, whereas the radiation efficiency at the rejected band is low.



Fig.3. Photograph of the band notched staircase shaped UWB antenna (a) Photograph. (b) Measured and simulated return loss.

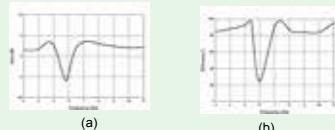


Fig. 4 Measured characteristics of the proposed antenna. (a) Gain. (b) Radiation efficiency.

Time Domain Analysis

Ideally, the received UWB signal should maintain exactly the same shape as the source pulse. However, the received signal may be distorted compared to the transmitted signal. Therefore, the time domain measurements of UWB antenna is indispensable and the antenna time domain performance should be carefully studied to make sure that the unwanted distortion is minimized.

A typical transmitting/receiving antenna system is set up for that purpose using the proposed antenna. Then, the transmission coefficient is measured by aligning the two identical antennas along the face-to-face and side-by-side orientations. Subsequently, the transfer function is calculated from the measured for each orientation as in [2].

The fourth order Rayleigh pulse is the waveform template chosen for pulse characterization and analysis of the proposed antenna because its spectrum directly matches the UWB band. To qualitatively evaluate the distortion performance, the received pulses at the two orientations (face to face and side by side) need to be calculated. In Fig. 6 (a), the waveforms of the transmitted and received pulses are shown. By comparing the transmitted and received pulses, it can be observed that the received pulses maintain the shape of the transmitted pulse to a great extent. As a result, it can be concluded that the distortion caused by the antenna to the transmitted pulse is feeble.

A figure of merit to quantitatively evaluate the distortion introduced by an UWB receiving antenna is the fidelity factor (FF). When the value of FF is unity, the input and received pulses are identical, and no distortion occurs. The FF is a function of the orientation of the received antenna. In our case, the FF is measured in the H-plane between 0° and 360°, and the result is shown in Fig. 10 (b). The obtained value of FF is greater than 0.9 in all measured azimuth angles, which indicate that the proposed antenna introduces minimal distortion effects to the transmitted signal. Maximum fidelity for the antenna is found to be 94.61%.

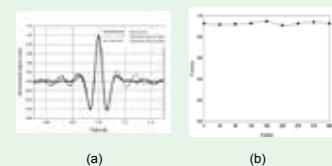


Fig. 6: Time domain performance of the proposed antenna. (a) Input and received pulses. (b) Fidelity factor.

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Five Ports Power Divider Designs with Controllable Power Division and Switching Capabilities

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Abstract

Two new 5-ports power divider designs capable of controlling the power division ratios between the output ports are proposed. In the first design, the input power is switchable between two pairs of the output ports. This is implemented by terminating the dividers two open-ended stubs with varactor diodes. In the second design, the power division is controlled by a single varactor diode that terminates one of the dividers two open-ended stubs. With judicious choice of dc bias voltage, it is possible to realize equal as well as unequal power division ratios between the four output ports. High power division ratios was achieved without the necessity of involving transmission lines with high impedances. Measurement and simulation results are presented for the designs to show their power division and matching performance.

Introduction

Numerous designs of microwave power dividers with various features have been developed to cater for new applications and to meet certain design requirements. Frequency agility and power division controllability are examples of features required in some modern power divider designs. To control the power division ratio, a reconfigurable mechanism should be introduced to the power divider design. Such reconfigurability in power dividers can be implemented using MEMS, PIN diodes, RF switches, and varactor diodes.

Arbitrary power division ratios can be achieved by properly selecting the characteristic transmission line impedances in some multi-port planar power dividers. However, to realize a different ratio, the divider needs to be redesigned and refabricated. Also, realizing high power division ratios is difficult as the design will involve high characteristic impedances which are difficult to fabricate. Overcoming such an issue can be accomplished by untraditional techniques that involve the use of defected ground structures, grooved substrates, and electromagnetic band gap patterns.

In this research, two power divider designs with reconfigurable features are analyzed and implemented. These designs are developed from a 5-port power dividing network through the use of varactor diodes. The first design is a switchable 2-way power divider, whereas the second design is a 4-way power divider with a controllable power division ratio. In both designs, the output ports are grouped into two pairs. In the first design, the output power is switchable between the two pairs of output ports by independently biasing two varactor diodes. In the second design, the input power is divided between the two output pairs with a power division ratio that is controlled using a single varactor diode. Various power division ratios are achievable by adjusting the dc bias voltage applied to the varactor diode.

Design Configuration

The design configuration is shown in Figure 1. The lines joining adjacent ports are all $N/4$ long at the operating frequency. Nodes m and n are connected to open circuited lines that reflect reactive impedances jX_m and jX_n at the respective nodes. The circuit is symmetrical about the line joining the terminated nodes m and n which dictates that $V_1 = V_2$ and $V_3 = V_4$ (where V_1 to V_4 are the voltages of the output ports 1 to 4, respectively, and V_5 is the input voltage at port 5).

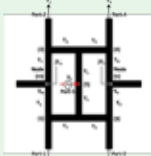


Figure 1. The design configuration of the proposed 5-ports power dividers.

Method

The two designs are first simulated using Advanced Design System software and then manufactured on Roger's Duroid 5880 substrate with dielectric constant of 2.2 and thickness of 0.787mm. Finally measurements are obtained and compared with simulation results.

Design-1 :switchable 2-way power divider

In this design, the configuration shown in Figure 1 is developed to be a switchable power divider with two switching states where the input power can be switched between the output ports pairs (1, 2) or (3, 4).

To implement this design, each of nodes m and n is connected to a transmission line terminated with a varactor diode. The lines connected to nodes m and n are both of the same length L and characteristic impedance Z_{stub} ($Z_{stub} = Z_3 = Z_4$). Each of these varactor-terminated lines is equivalent to an open stub with an effective length L_{eff} which is controlled by the value of the junction capacitance C_j of the varactor. To realize a short circuit termination, the value of C_j is set so that $L_{eff} = N\lambda/2$ (k is an integer), whereas to realize an open circuit termination, C_j is set so that $L_{eff} = N\lambda/2$ (k is an integer).

A photograph of the fabricated design is shown in Figure 2(a). In this configuration, two varactors (SMV2019 manufactured by Skyworks) are incorporated. Also, four 39pF capacitors (0805 ACCU-P manufactured by AVX) are placed to block the dc power from reaching the RF ports of the circuit, and to isolate the dc bias voltages applied to the varactor diodes from each other. It is worth mentioning that the blocking capacitors were not placed in the stubs, and this is to avoid an increase in the electrical length of the stubs which results in a narrower bandwidth. Each varactor diode is biased independently using a bias circuit.

To realize the switching state A, node m is short-circuited while node n is open-circuited, and this is achieved by biasing the varactors so that C_j of the left and right varactors are set to 0.16 pF (corresponding to the maximum reverse bias of 20 V) and 2.25 pF (corresponding to a DC bias of 0 V), respectively. In state B, the terminations of nodes m and n are interchanged. This is achieved by simply interchanging the bias voltages of the two varactors. The measurement results of both switching states are shown in Figures 2(b)-(c).

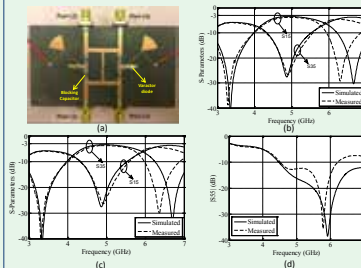


Figure 2. (a) Photograph of the fabricated switchable 2-way power divider. (b) Measurement vs. simulation results for $|S_{15}|$ and $|S_{33}|$ (State A). (c) Measurement vs. simulation results for $|S_{15}|$ and $|S_{33}|$ (State B). (d) Measurement vs. simulation results for $|S_{55}|$ (identical for both states).

In Figure 2(b), it can be seen that $|S_{15}| = -3.47$ dB at the operating frequency of 5 GHz which indicates a loss of approximately 0.4 dB (due to the resistance of the varactors and the losses associated with the transmission lines). Plots of $|S_{25}|$ and $|S_{45}|$ are not shown because they are identical to that of $|S_{15}|$ and $|S_{35}|$, respectively. The response of $|S_{55}|$, which is shown in Figure 2(d), indicates good matching performance. The operating range for which both $|S_{35}|$ and $|S_{55}|$ are less than -10 dB is between 4.47 GHz and 5.52 GHz which is more than 1 GHz of bandwidth. In this frequency range, $|S_{15}|$ and $|S_{25}|$ vary within 1 dB. As expected, similar results are observed for state B where the results shown in Figure 2(c) are almost the same as in state A.

Design-2 :Controllable 4-way power divider of various division ratios

This design is also developed from the configuration shown in Figure 1 where node m is short-circuited, whereas node n is terminated with a reactive load. By varying the reactance X_n of the load, different power division ratios between the output pairs (1, 2) and (3, 4) can be attained. The two terminations are practically implemented in the proposed design by connecting node m to a quarter wavelength open stub (effectively short circuiting node m at the design frequency) and attaching a varactor-terminated transmission line to node n . The varactor-terminated line is equivalent to an open stub with an effective length which is controlled by the value of C_j of the varactor. The varactor used in this design is also the SMV2019 manufactured by Skyworks. The varactor is biased using the a radial stub circuit. Four 39 pF DC blocking capacitors (0805 ACCU-P manufactured by AVX) are incorporated in the design as in the first design. The two capacitors on the left (near the quarter wavelength open stub) are placed only to maintain design symmetry. A photo of the fabricated design is shown in Figure 3.a.

In Figures 3 (b-c), the measurement results are plotted for three selected values of C_j . These values lie in the range between $C_{sc} = 0.16$ pF corresponding to the maximum reverse bias of 20 V and $C_{oc} = 2.25$ pF corresponding to a DC bias of 0 V. It can be observed from the plots shown in Figures 3 (b) and (c) that at the operating frequency of 5 GHz, the input power is divided between the output ports pairs in ratios that depend on the value of C_j . The power division ratios at the design frequency are listed in Table 1 for different values of C_j . It is observed from Table 1 that while increasing C_j from 0.16 pF to 2.25 pF, the power level of S_{15} increases from -6.96 dB to -3.61 dB and the power level of S_{35} decreases from -6.57 dB to -26 dB. It can be seen from Figure 3(d) that having a good input matching at frequencies other than 5 GHz is dependent on the value of C_j . For example when $C_j = 0.26$ pF, matching occurs in the frequency range 4.6 to 5.8 GHz while for $C_j = 2.25$ pF the matching occurs in the range from 3.6 to 5.5 GHz.

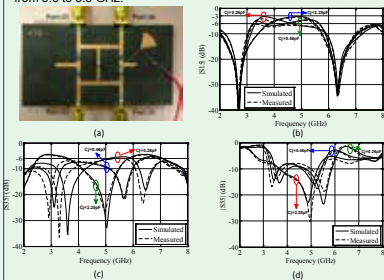


Figure 3. (a) Photograph of the fabricated Controllable 4-way power divider of various division ratios (b) Measurement vs. simulation results of $|S_{15}|$, (c) Measurement vs. simulation results of $|S_{35}|$, (d) Measurement vs. simulation results of $|S_{55}|$.

C_j (pF)	Sim. S_{15} - S_{35} (dB)	Meas. S_{15} - S_{35} (dB)	Sim. S_{15} - S_{35} (dB)	Meas. S_{15} - S_{35} (dB)	Sim. S_{55} (dB)	Meas. S_{55} (dB)
0.16	-6.396	-6.965	-6.545	-6.574	-11.74	-10.02
0.26	-6.861	-6.942	-6.274	-6.600	-11.77	-10.06
0.39	-6.624	-6.895	-7.761	-7.866	-13.25	-12.45
0.48	-6.806	-6.076	-9.347	-9.108	-14.57	-13.19
0.71	-3.740	-3.896	-14.27	-14.890	-17.53	-20.61
0.99	-3.440	-3.681	-18.58	-19.280	-18.65	-28.85
2.25	-3.257	-3.606	-30.24	-26	-19.08	-27.93

Table-1

Acknowledgement

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Retailer Driven Supply Chain With Limited Transportation Capacities and Supply-Demand Market Index



قسم الهندسة الصناعية والنظم الإدارية

Abstract The problem of optimal shipping rates within a supply chain (SC) of minimum collaboration between its partners in a stochastic demand environment is addressed. Particularly, we consider a SC that consists of a set of manufacturers, distribution centers and retailers. The SC is served by logistic service provider (LSP) who operates under the umbrella of the retailers. The LSP is supposed to transport as much as demanded of products from the manufacturers to the destined retailers, however, The LSP limited transportation capacities restrict the retailers' aspiration to meet the entire demands. More product delay is expected if higher amounts beyond The capacities of the LSP are loaded into the network. The retailers, as they are at a risk of higher product delay charges, can cut their order release rates to make the manufacturers reduce the production rates for the quantities contracted.

Objectives

To determine the optimal shipping rates that maximize the retailers' returns subject to the available LSP capacities and products' demand with a Supply-Demand market index (SDMI)

Introduction Due to the concerns in sharing information in supply chains, we will present a supply chain model that works in a decentralized manner with minimal information sharing between the supply chain nodes. Here, the observed lead time at the retailer will be the main driving thrust to optimize the SC rates. We assume a logistic service provider that is supervised by the retailers. The retailers although try to maximize their sales, yet their ordered quantities are subject to the LSP capacities and the extra charges incurred upon excessive product delays. Hence, they tend to increase/decrease their incoming rates to avoid any delay and to meet as much as possible of the customer demands while monitoring the supply-demand ratio as a standard market indicator. The optimal rates are computed for each retailer. The decentralized solution algorithm is characterized by its simplicity, its convergence properties and the ability to handle stochastic demands while optimizing the retailer returns and by monitor the supply-demand market indicator (SDMI).

Methods

The returns of the SC are modeled as an optimization problem that has been solved using the KKT method. The solution algorithm can operate the SC in a parallel mode without information sharing between the SC partners.



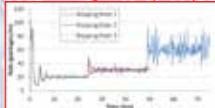
The mathematical model

$$\max \sum_{r \in R} \sum_{m \in M} \sum_{p \in P} v_{r,m,p} \alpha_p \log x_{r,m,p} - \frac{x_{r,m,p}}{d_{r,m,p}}$$

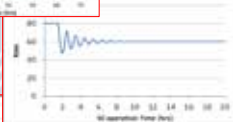
$$s.t. \left. \begin{aligned} x_{r,m,p} \sum_{p \in P} \alpha_p &\leq \sum_{p \in P} v_{r,m,p} \\ x_{r,m,p} &\leq d_{r,m,p} \\ x_{r,m,p} &\geq 0 \end{aligned} \right\} \forall p \in P, m \in M, r \in R$$

Results

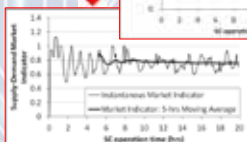
Variable Logistic capacity



Constant logistic capacity



SDMI



Random Demand



CONCLUSION

1. The solution algorithm can be implemented on the retailer side without collaboration with the other supply chain components.
2. The model provides a market indicator to assess the retailer performance by introducing the SDMI in the objective function.
3. Different simulation experiments were conducted using ARENA for modeling the stochastic demand and supply chain configurations.
4. The operational algorithm could drive the retailers to maximize their returns, keep steady inventories, and comply with the logistic service provider capacity with minimal information sharing and along with instantaneous SDMI performance measure.

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Measurement of Traffic Congestion Delay and Public's Attitudes in Kuwait

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Abstract

Practically every major urban area in the world is faced with growing daily traffic congestion. In this research study, the magnitude of time-delay and fuel waste due to daily congestion are estimated first. The public's awareness of congestion impacts and their willingness to participate in congestion-reduction programs are also addressed. Findings of the study indicate that more than one hour of every employed individual's time is wasted in daily congestion, and traffic congestion will continue to cost the state of Kuwait billions of Kuwaiti Dinars, in time and fuel wastes and in environmental decays, annually. Measures to shift the traveling public to other modes of urban travel, and to promote Travel Demand and Travel Supply Management measures are urgently needed.

Introduction

The growing problem of daily traffic congestion in Kuwait has now attracted the attention of the public, the private sector, and the government authorities, up-to the highest level of national decision makers.

Not long ago, it was promised by policy-makers in industrialized nations, that the auto will bring a colorful world of speed, freedom and convenience, and would transport people whenever they desired and wherever the road would take them. Bombarded with attractive advertisements and complemented with continuous auto-favored policies (paving everywhere, free parking every where, cheap fuel) people around the world enthusiastically embraced the dream of car ownership. But only a short while later, societies that took those promises for granted and built their transport systems mainly around the use of automobile are now waking up to much harsher reality.

Problems associated with auto-based urban transportation are numerous and complex. Traffic congestion and environmental pollutions plague every major urban area around the globe – industrialized and non-industrialized alike. Hundreds of millions of people are frustrated with traffic congestion in urban areas of the world every working day.

Objectives

- 1) To estimate the magnitude of time, fuel and air emissions due to daily traffic congestion in Kuwait.
- 2) To determine the public's awareness level and preferences for a number of congestion-management measures.

Methodology

The methodology used to collect the data was based on the following tasks:

- 1) Questionnaire survey of systematic-randomly selected employees in a number of government and private organizations (also systematic-randomly chosen).
- 2) Actual measurement of congestion delays at a number of roadways in Kuwait urban area (6 roadways, 35 trips).

Discussion

The average daily time wasted due to congestion was 68.2 minutes per person. By far, the majority (86.7 %) of the surveyed individuals drove to their work. The remaining 13.3 % used the following modes of travel to work: riding with others, 5.8 %; taking the bus transit, 3.7 %; taxis, 0.7 %; and finally 3.2 percent used other modes (e.g. walking, cycling).

More than 60 % of the surveyed individuals experienced very bad to bad level of congestion daily, 29.6 % found the congestion level to be acceptable.

The largest daily time waste (69.5 min) due to congestion was for those who drove. People, who took taxi for their daily travel, experienced the least amount of time wasted due to congestion (45 min).

By far, the majority (30.2 %) of the surveyed individuals suggested to stagger working times in order to reduce traffic congestion, 24.1 %; suggested to improve the infrastructural road design and signal cycle, 17.1 %; promotion of public transit, 9.9 %; apply strict traffic rules, 4.5 %; limit the usage of private cars, 3.1 %; public awareness, and finally 11 percent of the individuals had other suggestions (e.g. provide school buses, leave home early, decentralizations of activities, ride sharing, tele-working).

Total daily time waste cost due to congestion was 2,504,470,800 (kd/year).

Total fuel waste cost per year was 43,569,070 (kd/year).

Conclusion

Unprecedented growth in population and urbanization, massive increase in the fleets of private cars, favoring of the auto mode of urban travel, disjointed and unplanned urban land-use/transport policies, and low levels of public awareness concerning the harmful impacts of traffic-congestion have all combined to make the resulting daily traffic congestion a serious problem in Kuwait urban area.

The study findings have indicated that each employed traveling public wastes more than one hour of time each day in congested traffic. This daily waste of time accumulates to more than 2.5 billion Kuwaiti Dinars per year. The employed population in metropolitan Kuwait also waste nearly 44 million Kuwaiti Dinars worth of fuel each year.

And that is not all. The employed public generates air pollution agents while moving in congested traffic which harms our health and the health of our environment. The estimated cost of these harms is approximately 85 million Kuwaiti Dinars, annually.

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Variable Name	Frequency	Percent	Cumulative Percent
Mode of Travel:			
Drive	523	86.7	86.7
Ride	35	5.8	92.5
Bus	22	3.7	96.2
Taxi	4	0.7	96.9
Other	19	3.2	100
Time of Daily Trips:			
< 7.00 am	268	44.7	44.7
7 – 7.30	261	43.5	88.2
7.31 – 8.00	61	10.2	98.4
8.01 – 8.30	7	1.2	99.6
8.31 – 9.00	3	0.5	100
Driving Child to School:			
No	385	64.9	64.9
Sometimes	81	13.7	78.6
Yes	127	21.4	100

Table 1: The Frequency Distribution of Travel Mode, Time of Daily Trips, & Child Transport

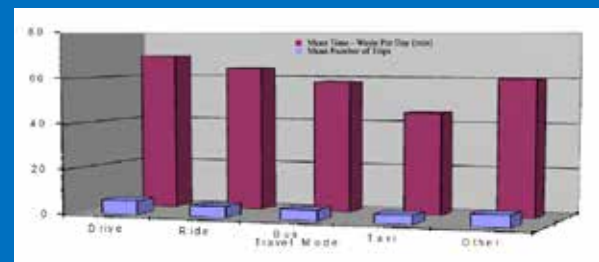


Figure 1: Relationship Between Travel Mode, Mean Number of Trips, and Mean Time-Waste Per Day

Variable Name	Frequency	Percent	Cumulative Percent
Paying The Monthly Fee of 30 KD & Drive	286	16.3	16.3
Paying The Monthly Fee of 40 KD & Drive	260	14.8	31.1
Paying The Monthly Fee of 50 KD & Drive	259	14.8	45.9
Riding The Free Minibus	813	46.4	92.3
Ride-Share	105	6	98.3
Riding Taxi	29	1.7	100

Table 2: The Frequency Distribution of Paying a Monthly Parking Fee & Drive Versus Riding a Free Minibus, Riding-Share, and Riding Taxi

Variable Name	Frequency	Percent	Cumulative Percent
Time Staggering	222	30.2	30.2
Infrastructure & Signal Improvement	177	24.1	54.3
Promotion of Public Transit	126	17.1	71.4
Apply Strict Traffic Rules	73	9.9	81.3
Limit Usage of Cars	33	4.5	85.8
Public Awareness	23	3.1	88.9
Other	81	11	100

Table 3.8 Frequency Distribution of Suggestions to Minimize Traffic Congestion



Indoor Daylight Analysis of Window used in Historic Buildings

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ABSTRACT Windows allow the daylight to naturally illuminates the indoor space, save energy for lightings, and create healthy working environment. However, excessive daylight increases the heat gain and causes discomfort glare. Therefore, external screens are used to control daylight. Mashrabiya is a framework consists of a crisscrossed pattern of strips made of building material, such as wood, or Gibson. In this study, experimental measurements have been conducted to study the effect of installing the perforated screen on the indoor illuminance level and heat gain through the window. The heat gain is decreased by up to 53%, without significant negative impact on the indoor natural illumination.

METHODOLOGY The following steps will be performed toward accomplishment of the project:

- A. Collecting information and data about the weather condition in Kuwait.
- B. Fabricating the solar screens.
- C. Performing experimental measurement for a window with a screen. Temperature and heat flux at the inner surface of window will be obtained. Global solar radiation at the indoor and outdoor will be measured, Figure 2.
- D. The illuminance level in the indoor space is measured using light meters. Light meters will placed at various locations in the indoor space.
- E. A thermal imaging camera is used for indoor surface of window.

INTRODUCTION Artificial lightings in buildings account for about 20% of total energy used in buildings [1]. Windows admit the daylight to illuminate the indoor space, save lightings' energy, and create healthy living environment. Windows are considered as a major source of heat gain, and unshaded windows account for 40% of the required cooling load for a building [2]. External solar shades are simple and cost efficient architectural component to reduce the cooling load, and they are sized based on a thermal optimization component [3]. A dynamic louvers with a light dimming strategy can save energy for lighting 34.02% for south oriented façade. daylighting and environmental impact was accomplished by F. Stazi et al. [4]. They indicated that the natural light distribution shows a similar medium daylighting level for various shading but different light uniformity levels. The external shading screen is one of the effective techniques to reduce the direct solar radiation while admitting a portion of the daylight to the indoor space. Figure 1 shows a building in Kuwait with screen installed.



Fig. 1, A residential building in Kuwait with windows screen.

RESULTS In this research, experimental measurements have been conducted to study the effect of installing the traditional design screens, the Mashrabiya, on the indoor illuminance level and heat gain through the window. The screen is installed in outdoor side of the window, to control the daylight and to conserve the cooling energy load. The screens are perforated wood boards with traditional designs. Figure 3 shows the screens used in the present research. Screens with different perforation rations, and the experiments are conducted for a window facing west and month of June. The perforation ration of the Design A screen is 12%, and 25% for design B.

A control strategies of the shading was established, and they are the orientation dependent and the generic, the space configuration, and the climate.. The results of the perforated solar screens are compared to window without the screen. A perforated screen reduces the natural illumination that improves the indoor visual environment, and saves energy for cooling load and artificial lightings. The illuminance is the total luminous flux incident on a surface, and the SI unit for the illumination is LUX, and one Lux is equal to one lumen per square meter. The comfortable illuminance level in a living room is 200 LUX. Figure 4 shows the measured illuminance level during a daytime for difference designs of perforated screen.

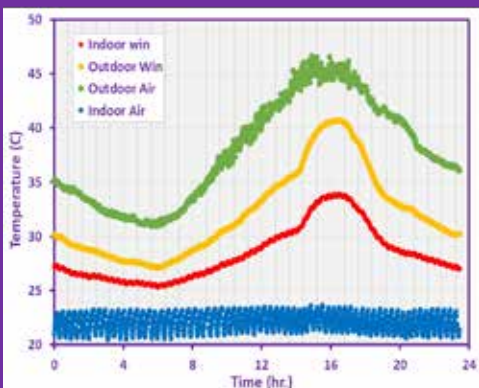


Fig. 2, Air and window temperature.



Fig. 3, Outdoor and indoor views.

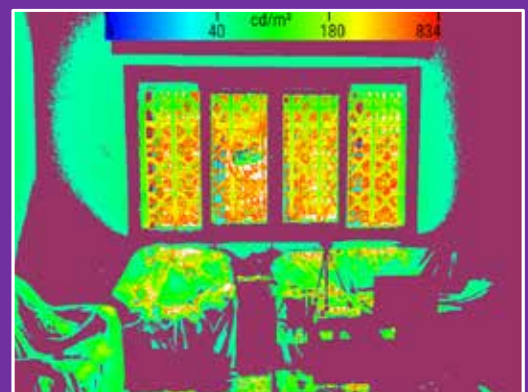


Fig. 4, LUX illumination mage at indoor space.

OBJECTIVES The traditional screen provides natural light, natural ventilation, and privacy. Experimental measurements have been conducted to study the effect of installing the perforated screen on the indoor illuminance level and heat gain through the window. The illuminance level in the indoor space, indoor and outdoor air temperatures, and global solar radiation in the site are measured. The window is facing west direction.

CONCLUSIONS Excessive daylight increases the heat gain and causes discomfort glare. Windows are considered as a major source of heat gain, The illuminance level reaches the acceptable value during the day. Installing the perforated screen has significant positive impact on the thermal performance of the window. The heat gain is decreased by up to 53%, without significant negative impact on the indoor natural illumination.

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MODELING OF A CONTINUOUS WATER DESALINATION PROCESS USING DIRECTIONAL SOLVENT EXTRACTION

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Abstract

A new process based on directional solvent extraction has been proposed as alternative to the evaporation-based and membrane-based desalination processes. The objectives of this research are to investigate the technical viability and predict the energy consumption of a continuous water desalination process using directional solvent extraction. Decanoic Acid (CH₃(CH₂)₉COOH) and Octonic Acid (CH₃(CH₂)₇COOH) are considered as potential directional solvent. Two process configurations were studied: one is modelled with no heat recovery and the other is modelled with maximum heat recovery using an optimum heat exchanger network. The effects of heat source temperature, feed water flow rate and heat exchanger effectiveness on the energy efficiency and water extraction process are presented and discussed. The results of the process modeling indicate the potential of Decanoic Acid as water extractor in a continuous desalination process with low temperature heat source.

Introduction

We propose to design, build and test a continuous, low temperature, membrane-free desalination system that can utilize solar energy and thermal energy storage (TES) based on the directional solvent extraction (DSE) process which uses a kind of directional solvent (DS). The ideas of solvent extraction for desalination were explored by Hood who used amines as solvents in the 1950s [1]. These solvents, however, were primarily discarded because they dissolve in the recovered water, leading to contamination [2]. The directional solvent (DS) discovered by Luo and coworkers was decanoic acid (DA) which has the following features [3]:

- The solvent can dissolve water.
- The water solubility increases with temperature.
- The solvent is insoluble in water.
- The solvent does not dissolve salt ions.

Based on these directional features, a batch process for DSE has been demonstrated for extracting pure water from saline sources (Figure 1). This process is briefly described below (Figure 1) [4]:

- The solvent is fully mixed with saline water (A-B).
- The temperature of the mixture is increased to TH, and water molecules dissolve into the solvent (B-C).
- The mixture is allowed to settle to separate the un-dissolved salt, leaving the solvent with pure water dissolved in it (C-D-E).
- The solution is cooled down, and due to the lower water solubility at lower temperature (TL), the water molecules precipitate out (E-F).
- Due to density difference, water and solvent separate and fresh water is recovered (F-G-H). The advantages of this DSE process are:
 - a) the use of very low temperature heat sources (TH can be as low as 40 °C), such as solar energy or waste heat, which are essentially free or would be otherwise wasted,
 - b) the re-cycling of the solvent that none of it is consumed, minimizing thus the operational cost,
 - c) being membrane-free, avoiding the capital and maintenance cost of membranes which are expensive and prone to fouling.

The batch process, however, is not practical for large-scale deployment and 24/7 fresh water production ability, which requires rather a yet untested continuous process based on the same principle.

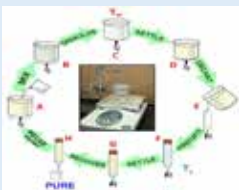


Figure 1: DSE for water desalination based on a batch process

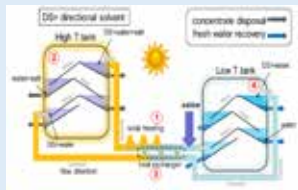


Figure 2: A two-tank continuous process for DSE water desalination integrating solar energy and heat exchanger

Objective

The objective of this project is to design, construct and test a continuous, low temperature, membrane-free desalination system based on the directional solvent extraction (DSE) utilizing solar energy and thermal energy storage (TES) systems based on the directional solvent extraction (DSE) process. Based on these directional features, a batch process for DSE has been demonstrated for extracting pure water from saline sources. The batch process, however, is not practical for large-scale deployment and 24/7 fresh water production ability. Therefore, a continuous process based on the same principle will be designed, constructed and tested using solar energy as a source of low temperature energy.

Research Methodology

The core of the technological breakthrough is the continuous desalination process (Figure 2). This has never been tried or tested before either in a laboratory or plant scale, though the principle of DSE has been demonstrated in the batch process. The key steps of the continuous DSE plant are described as below: Saline water enters the system and mixes with the DS. This stream is pre-heated in a heat exchanger and further heated by solar radiation. During the heating, a certain amount of water molecules diffuse into the DS due to higher solubility at higher temperatures. Salt ions do not dissolve due to the directional feature of the solvent. The heated stream (DS+water+salt) enters a tank in which it passes through a series of stages. Due to gravity, brines are separated out to the bottom and disposed. This process is significantly speeded up by applying an external electrostatic field. The stage-wise structure is used so as to fully separate all the salt ions. The stage geometry is designed to prevent possible remixing due to flow.

The stream, which contains only DS and water, exits the first container and passes through the heat exchanger to cool down. After cooling, water molecules precipitate out due to the solubility decrease with the lowering temperature.

After entering the second tank, due to gravity and external electrostatic fields, fresh water quickly settles down to the bottom and is extracted at each stage. The solvent exits the tank and is mixed with saline water again to enter another cycle. An important improvement in the proposed continuous system is the application of electrostatic fields (e.g. electrophoresis) that can significantly decrease the separation time by speeding up the water droplets coalescence (Figure 3). This method uses a minimal amount of energy, and it has long been used in the oil industry for desalting and dehydration purposes[5], [6]. Due to their low energy consumption, the electrostatic fields can be maintained using electricity generated by small solar photovoltaic panels. A detailed study of the coalescence and the separation process of water droplets in DS under external electrostatic fields will be carried out in this work.

Preliminary Results

The steady-state component models used to study the desalination process are described in this section. In addition to the basic components used in the conventional energy systems such as pumps and heat exchangers, the desalination process using directional solvent extraction introduces three new components: a mixing tank, high temperature settlement tank and low temperature settlement tank where low temperature saturated directional solvent is allowed to separate from the fresh water. Mass and energy balances are written for each component. The system equations are nonlinear. The model for the cycle shown in Figure 3 is solved numerically using an equation-solving program with built-in thermodynamic property data for pure water and water-salt mixtures. The results are shown in Table 1. Functions which evaluate the thermodynamic properties of the directional solvents, Decanoic and Octonic acids, are written and added to the computer program. The density and specific heat of the directional solvents, shown in Table 2, are assumed constants in the temperature range between 40 °C to 80°C.

Table 2: Properties of Decanoic and Octonic acids

Directional Solvent (DA)	Chemical Formula	Molecular Weight (kg/kmole)	Density (kg/m ³)	Specific Heat (kJ/kg-K)	Melting Point (°C)
Decanoic Acid	CH ₃ (CH ₂) ₉ COOH	172.26	893	2.351	31.0
Octanoic Acid	CH ₃ (CH ₂) ₇ COOH	144.21	910	2.200	16.7

Table 1: Thermodynamic state points for a continuous desalination process, shown in Figure 3, using directional solvent extraction with maximum waste heat recovery

State	T (°C)	P (kPa)	h (kJ/kg)	ρ (kg/m ³)	m (kg/s)	sa (g/kg)	Description
1	80	121	113.4	896.9	81.46		Saturated DA
2	50	111	47.2	897.7	79.53		Saturated DA
3	40	111	23.4	896.9	80.46		Saturated DA
4	40	131	23.4	896.9	80.46		Saturated DA
5	70	121	88.8	896.1	80.46		Saturated DA
6	25	101	99.8	1023.5	2.00	35	Sea water feed
7	25	141	99.8	1023.5	0.96	35	Sea water feed
8	40	131	159.7	1018.3	0.96	35	Sea water feed
9	70	121	280.2	1003.5	0.96	35	Sea water feed
10	80	121	115.7	898.5	82.46	70	Mixture of sea water feed and DA
11	80	121	306.7	1023.1	1.00	70	Disposable high concentration salt brine
12	50	111	190.6	1039.8	1.00	70	Disposable high concentration salt brine
13	35	101	132.8	1046.6	1.00	70	Disposable high concentration salt brine
14	40	111	167.5	992.1	1.00		Fresh water
15	35	111	146.6	994.0	1.00		Fresh water
16	25	141	99.8	1023.5	1.04	35	Sea water feed
17	30	131	120.0	1023.5	1.04	35	Sea water feed
18	70	121	280.2	1023.5	1.04	35	Sea water feed
19	70	121	280.2	1003.5	2.00	35	Sea water feed
20	41	111	27.3	897.7	1.93		Saturated DA

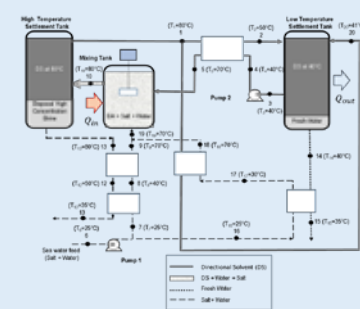


Figure 3: Continuous desalination process using directional solvent extraction with maximum waste heat recovery

Acknowledgements

We gratefully acknowledge the financial support of Kuwait University Research Grant number RE-01/12

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DIESEL PARTICULATE FILTERS: NEW GENERATION OF DIESEL OXIDATION/REDUCTION CATALYSTS WITH ULTRA LOW NO₂ EMISSIONS

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Abstract

Nitrogen Dioxide (NO₂) is considered potentially one of the most harmful emission gases in diesel engine exhaust. On a world-wide basis, recommendations are being made to limit the conditions under which NO₂ are produced. These include diesel engine management and exhaust after-treatment. United States Environmental Protection Agency (US EPA) and California Air Resources Board (CARB) have initiated rulings to limit NO₂ emissions. The overall objective of this research project is to optimize a washcoat based on nano-particles (nano-washcoat) for new generation of diesel oxidation/reduction catalysts (DORC) that reduce NO₂ while oxidizing carbon monoxide (CO) and total hydrocarbons (THC). In combination with an Active Diesel Particulate Filter (ADPF), 90% reductions in soot, CO, THC and NO₂ are expected. Using multi-stage substrates and a mix of oxidation and reducing catalysts, this project has two major tasks:

1. Finalize coating application methodology of the proprietary nano-washcoat to sintered metal fibers to attain uniform coating and high metal adhesion.
2. Using precious and non-precious metal coating formulations, finalize the coating application methodology of the proprietary catalytic topcoats to obtain uniform coatings and no shedding.

The development and application of diesel oxidation/reduction catalysts will be used to create new or enhance existing ADPF products. This will also allow to develop new products for school buses and mining equipment, where there is great demand for diesel emissions control systems that reduce NO₂.

Introduction

Diesel exhaust emissions consist of different exhaust components that include Particulate Matter (PM), Carbon Monoxide (CO), Total Hydrocarbons (THC) and Nitrogen Oxides (NOx). PM is a complex mixture of extremely small particles (soot) and liquid droplets, primarily incompletely burnt fuel. The small particles adsorb other toxins from the engine exhaust, which can cause adverse health effects including cancer and other pulmonary and cardiovascular diseases. In enclosed spaces, CO resulting from incomplete fuel combustion, is known to cause headaches, dizziness and lethargy, and in extreme cases, death. THC, a contributor to smog, will cause lung irritation in similar environments. NOx, primarily Nitric Oxide (NO) and Nitrogen Dioxide (NO₂), are formed at high temperatures during diesel fuel combustion. While neither NO nor NO₂ is desirable, NO₂ is the more reactive gas associated with significant health problems. Scientific evidence links NO₂ exposures, with adverse respiratory effects. Several studies were also done to investigate the health effect of children exposure to diesel exhaust in school buses. Their conclusions show that diesel emissions have been associated with health problems, being potentially harmful to children near school buses.

Passive Diesel Particulate Filters (PDPFs) rely on NO₂ as an oxidizer of carbon to remove the soot from the exhaust stream. This technique requires that NO₂ to be produced by the remediation device. Unfortunately, an excess of NO₂ is produced, only partially used in the carbon oxidation process, thus creating NO₂ slip to the atmosphere, which is highly undesirable. The National Institute for Occupational Safety and Health (NIOSH) studies have shown a significant increase in NO₂ concentrations in mine air, resulting from the use of catalyzed filters. Because NO₂ is a lung irritant a ceiling value of 5 ppm has been set to lower miners' exposure. NO₂ slip from exhaust remediation devices is such a great concern that EPA and CARB have limited NO₂ slip increase to 20% of engine baseline for diesel retrofits, EPA (2007), EPA (2010), and CARB (2010).

Active Diesel Particulate Filters (ADPFs), on the other hand, do not rely on NO₂ as an oxidizing agent of carbon, Ibrahim et al. (2016). ADPFs are ideal for the application of diesel oxidation/reduction catalysts (DORC) that oxidize CO and THC, and at the same time reduce NO₂. In the last 3 years, significant progress has been made in developing oxidation/reduction catalysts, that selectively oxidize CO and THC and the same time reduce NO₂ to NO, Ibrahim and Wenghoefer (2009). The results led to catalyst systems based on nano-washcoats, combining precious metal and non-precious metals to attain the desired oxidation and reduction levels. The challenge is the formation of stable nano-washcoat and catalyst coatings for the metal fiber substrates that do not shed or flake off during the designed service life.

Objective

The overall objective of the project is to optimize a nano-washcoat on sintered metal fibers filter medium for new generation of diesel oxidation/reduction catalysts (DORC) that oxidize CO and THC and reduce NO₂.

Importance

Since NO₂ is a reactive gas associated with health problems especially with children and workers in confined spaces. Both the US Environmental Protection Agency (EPA) and California Air Resources Board (CARB) initiated rulings for diesel emissions to limit NO₂ emissions.

Preliminary Results

We have performed preliminary analysis on coated and uncoated metal fibers using the Field Emission Scanning Electron Microscope (FE-SEM). FE-SEM is part of Kuwait University Nanotechnology Research Facility (KUNRF). Figure 1 shows uncoated 35 micron sintered metal fibers made of FeCrAlly. The average chemical analysis, shown in Figure 2 (Spectrum 67 and 68), confirms the expected chemical composition of FeCrAlly. Figure 3, on the other hand, shows the aluminium oxide (Al₂O₃) nano-washcoat on 35 micron sintered metal fibers. The coating was done with 50 nanometer Al₂O₃ particles in colloidal solution. It is clear from the picture there are small cracks on the surface as a result of the excess coating material. The average chemical analysis, shown in Figure 4 (Spectrum 59 and 60), shows that the Al₂O₃ nano-coating is not uniform. The goal of this study is to define coating processes that results in uniform nano-washcoats with no excess material and surface cracks.

Research Methodology

To achieve the objective of this project, the research will specifically focus on two major tasks: (1) Finalize coating application methodology of the proprietary nano-washcoat to sintered metal fibers to attain uniform coating and high metal adhesion; (2) Using precious and non-precious metal coating formulations, finalize the coating application methodology of the proprietary catalytic topcoats to obtain uniform coatings and no shedding. Surface chemical analysis using FE-SEM will be performed to quantify the distribution of the nano-washcoats and topcoats on the surface of the metal fibers.

Comments

Based on initial findings, adhesion of the nano-particle washcoat to the metal fibers needs to be improved to reduce excess material, cracks, shedding or flake-off of the wash-coat/catalyst topcoat. A major task of this project is to improve the coating technology of catalytic topcoats for uniform application and improved adhesion to the nano-washcoat. Our plan is to add high temperature binders such as silicon dioxide (SiO₂) as nanoparticles in colloidal solutions. Using high temperature binders, in small amount, is expected to improve adhesion between the metal oxide nano-particles and between nano-particles and the surface of the metal fibers.

Catalyst formulations have been developed using a combination of precious and non-precious metals to provide "mild" oxidizing coatings which selectively oxidize CO and THC and significantly reduce NO₂ to NO. Catalyst formulations evaluated include transition elements including Lanthanides. Evaluation of potential combinations of topcoats will be performed using small samples.

Scale-up of the exhaust remediation systems proved that performance of the nano-washcoat and catalytic topcoat was reproducible in larger systems; however, engine vibration and exhaust pressure changes contributed to wash-coat/catalyst topcoat shedding or flake-off. As a result, performance of the exhaust remediation system decreased with time. Catalyst poisoning was considered in our evaluation of the performance drop-off, but did not appear to be a contributing factor. Evaluation of metal surface preparation and slight nano-washcoat modifications are expected to resolve adhesion issues.

Acknowledgements

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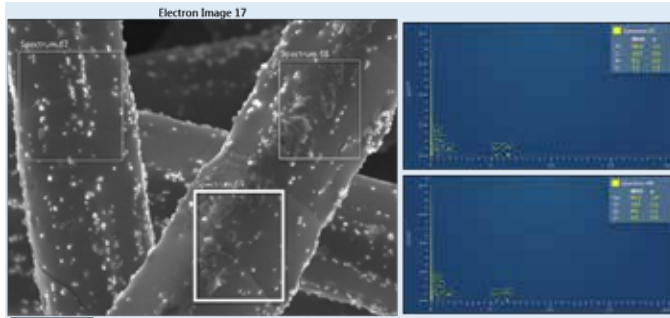


Figure 1: Uncoated 35 micron sintered metal fibers

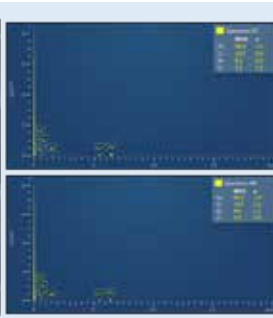


Figure 2: Chemical analysis on the surface of un-coated 35 micron sintered metal fibers. Spectrum 67 and Spectrum 68

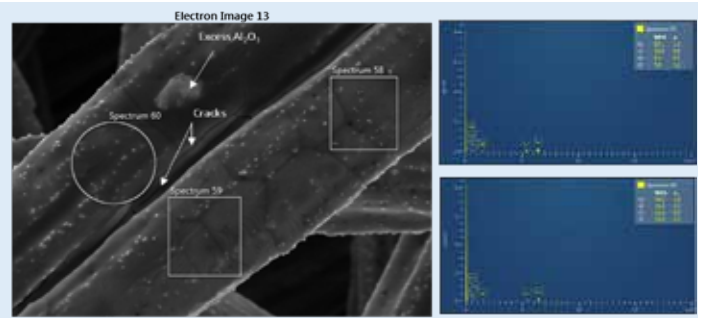


Figure 3: Coated 35 micron sintered metal fibers.

Figure 4: Chemical analysis on the surface of coated 35 micron sintered metal fibers. Spectrum 59 and Spectrum 60

Probabilistic Image Matching: Changing the Rules of the Game

Adnan A. Y. Mustafa



KUWAIT UNIVERSITY

No financial funding was provided for this research.

Abstract

This research shows that to detect dissimilarity between images –even highly similar images- only a few pixels need to be compared and not all pixels. This is accomplished by a probabilistic matching model that predicts the number of points required to compare images. Test results are in close agreement with theoretical prediction.

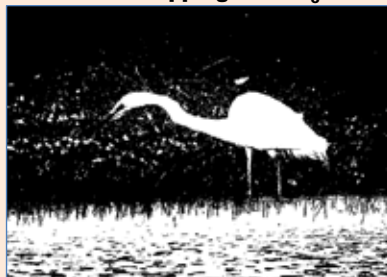
Probabilistic Matching Model for Binary Images (PMM)

$$\Pr(\gamma, p) = 1 - \left(\frac{1}{2}(1 + \gamma)\right)^p \left(1 + \left(\frac{1 - \gamma}{1 + \gamma}\right)^p\right)$$

where

$$\gamma(\mathbf{u}, \mathbf{v}) = |1 - 2P_o(\mathbf{z} = \mathbf{u} \oplus \mathbf{v})|, \quad \mathbf{z} \in \{0, 1\}$$

and \mathbf{u}, \mathbf{v} are the images, p is the number of mappings and P_o is the

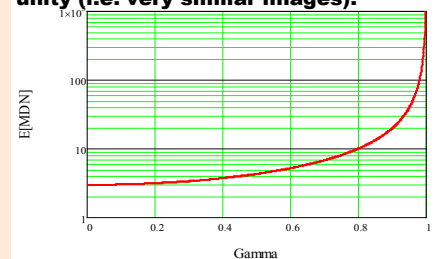


Detecting Dissimilarity

The expected number of mappings required to detect similarity (MDM) is given by:

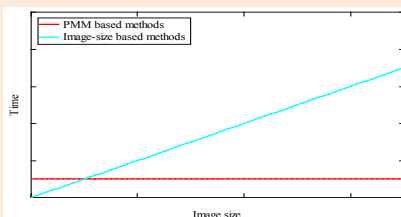
$$E[MDN(\gamma)] = \frac{4}{1 - \gamma^2} - 1$$

Below is a plot of this equation, where it can see that **MRN** has small values except when γ is close to unity (i.e. very similar images).

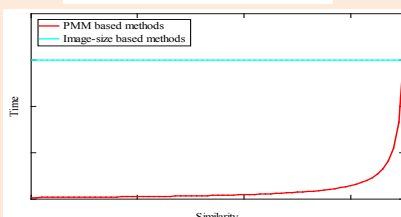


Introduction

Current state of the art image matching techniques, whether adopting an intensity-based approach (where image pixel intensities are compared) or a feature-based approach (where features are extracted and then compared) are image sized dependent. As image size increases, so does matching time! However, matching in similarity space rather in size space using a probabilistic approach, not all of the image pixels have to be compared, but only a small fraction of them and is size invariant. We present a model for matching binary images.



matching time vs. image size.



matching time vs. image similarity



Dissimilarity Detection of Highly Similar Images

Top pair: $\gamma = 0.998$ (99.9% similar), on average 1000 pixel comparisons are required to detect dissimilarity. Bottom pair: $\gamma = 0.854$ (92.7% similar), on average 14 pixel comparisons are required to detect dissimilarity.

These results are regardless of image size.

Matching Bird Images (From top to bottom: I_1, I_2 and I_3)

	Image pairs		
	I_1, I_2	I_1, I_3	I_2, I_3
Similarity	88.7%	67.4%	78.7%
γ	0.887	0.674	0.787
$E[MDN_p]$	17.759	6.330	9.509
Test MDN_p	19.201	7.369	10.281

Test results are in close proximity to the predicted theoretical values of PMM.

Conclusion

A probabilistic approach to matching leads to quicker matching than conventional methods as long as the similarity between the images is less than 99.9998%. The method is size invariant.

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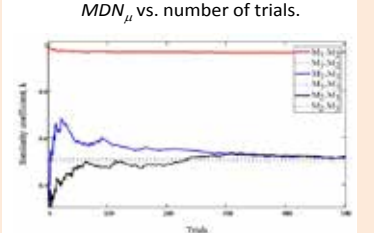
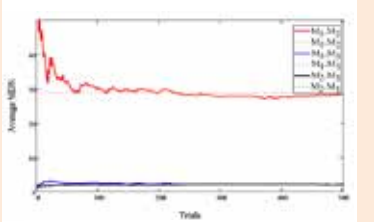
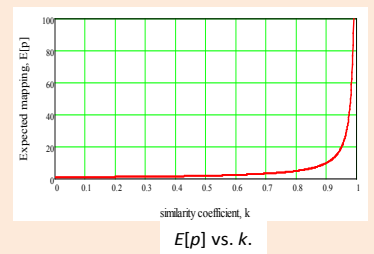
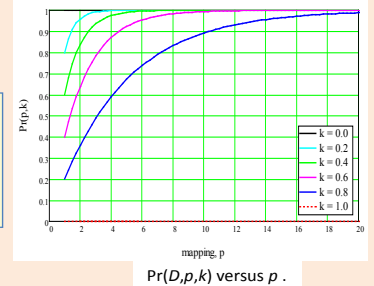


Quick Matching of Big Data: the Binary Case

Adnan A. Y. Mustafa

Abstract

We present a probabilistic matching model that predicts the number of points required to compare two binary data sets. We show that to detect dissimilarity only a very small number of points - and not all of the data- need to be compared. The model is size invariant; huge data can be matched as quickly as matching small data. The similarity between the data can also be measured to a good degree by repeating the matching process several times.



Introduction

The need to compare big data arises in many fields of science. In many instances the data is binary (e.g. image analysis, audio processing, character recognition and computer file comparison). Because of the huge size of the data, traditional matching methods (e.g. correlation or SAD) that compare all of the data are not practical, and a more efficient way of comparing the data becomes crucial.

Approach

Using a probabilistic approach, we show that to compare two sets of data, only a small fraction of the data needs to be compared to determine the amount of similarity between them.

Conclusion

Using a probabilistic approach to matching leads to quicker matching. The amount of similarity between the data can be estimated to a good degree (< 5% error) by repeated trials.

No financial funding was provided for this research.

A Probabilistic Model for Matching Binary Vectors

Given two binary vectors \mathbf{u} and \mathbf{v} , the probability of dissimilarity occurring between them on the p th mapping is,

$$\Pr(D, p, k; \mathbf{u}, \mathbf{v}) = 1 - (k(\mathbf{u}, \mathbf{v}))^p$$

for $p = 1, 2, \dots$ and $k \in [0, 1]$ is the similarity between the vectors,

$$k(\mathbf{u}, \mathbf{v}) \equiv \varphi((\mathbf{u} \oplus \mathbf{v}) = 0)$$

$\varphi()$ is the probability mass function. k is related to the hamming distance (d_H):

$$k(\mathbf{u} \oplus \mathbf{v}) = 1 - \frac{1}{n} d_H(\mathbf{u}, \mathbf{v})$$

where n is the vector size.

The probability distribution function of detecting dissimilar vectors, $P_D(p, k)$

$$P_D(p, k; \mathbf{u}, \mathbf{v}) = (k(\mathbf{u}, \mathbf{v}))^{p-1} - (k(\mathbf{u}, \mathbf{v}))^p$$

The expected value and standard deviation of p is:

$$E[p] = \frac{1}{1-k} \quad \sigma[p] = \frac{\sqrt{k}}{1-k}$$

Let MDN denote the *Mapping Detection Number* which is defined as the number of mappings required to detect a pair of vectors as being dissimilar and MDN_μ is its the mean value. k can be estimated by,

$$k(MDN_\mu) = \frac{MDN_\mu - 1}{MDN_\mu}$$



Controlling Stick-Slip and Bit-Bounce in Drill-Strings

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ABSTRACT

A dynamic model with an active control strategy was obtained to reduce stick-slip and bit-bounce of a drill-string with a top-drive rig system in oil fields. The model includes complete drive systems for both rotational and axial motions, as well as the hoisting system. Simulation results show that in certain conditions the drill-string may experience high values of Torque on Bit (TOB) and Weight on Bit (WOB), which can damage sensitive tools within the drill-string. The numerical simulations demonstrate that vibrations can be mitigated with the simultaneous presence of axial and torsional feedback controllers in the system.

OBJECTIVES

The main objective is to study the relation between stick-slip and bit-bounce by developing a mathematical model for top-drive system rigs and include the effect of the complete drive system for both rotational and axial motions. In-addition a control strategy is to be designed and implemented to the system for mitigating vibrations and assuring smooth drilling conditions.

INTRODUCTION

A drilling rig is a combination of a large number of equipment that are connected with each other to drill a well for producing hydrocarbons (Figure 1). Drilling rigs usually experience severe vibrations at the drill-string, which consists of drill pipes and drill collars (Bottom Hole Assembly). These vibrations are mainly of three types: torsional (stick-slip oscillation), axial (bit-bounce), and lateral (whirl) vibrations. These vibrations may occur due to formation/drill string interaction, imbalance, or initial curvature within the drill collar section. When these vibrations are severe they may cause failures in drill-string components, the loss of expensive tools in the hole, such as bit and logging sources/equipment, bit damage (as shown in Figure 2), wellbore instability and reduction in the Rate of Penetration (ROP). (Yigit and Christoforou, 2006)

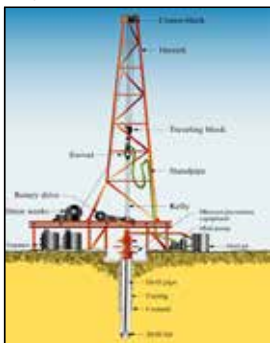


Figure 1: Basic rig components schematic for a drilling rig.

METHODOLOGY

The governing equations of axial and torsional motions were derived using Lagrange's method, a Matlab code were constructed to solve the system. The numerical results obtained were validated

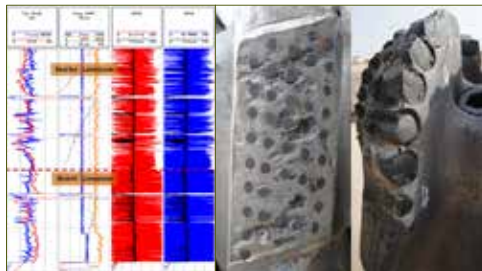


Figure 2: Field log and bit condition after experiencing severe vibrations. (KOC, 2015)

with real data logs recorded while drilling the production sections in Kuwait fields. After studying the system an axial and torsional feedback controllers were designed and implemented to the system using robust pole-placement algorithm with Ackermann's method.

Figure 3, represents the simplified lumped model for axial (left side) and torsional (right side) motions based on the assumption that the BHA behaves rigidly.

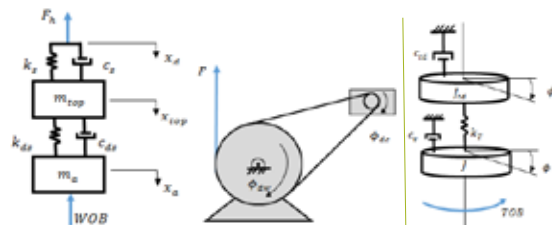


Figure 3: Simplified lumped model for axial and torsional motion.

RESULTS

The open loop simulations for a soft formation and a desired bit angular speed of 11.5 rad/s is presented in Figure 4. It can be shown that the system is experiencing both stick-slip and bit-bounce vibrations with large values of TOB and WOB.

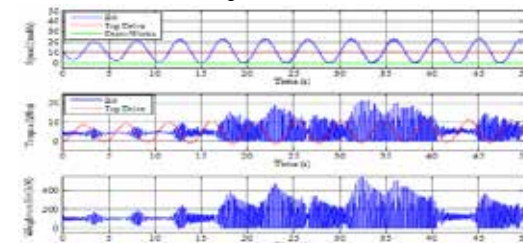


Figure 4: Open loop simulations at $\omega_d=11.5$ rad/s and $kc=50$ MN/m.

A torsional feedback controller is designed and implemented to the system using pole-placement algorithm to mitigate stick-slip presented in Figure 4. Figure 5, represent the closed loop simulations with the presence of torsional controller for a softer formation and a desired bit angular speed of 15.7 rad/s.

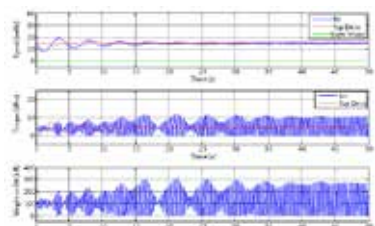


Figure 5: Closed loop simulations at $\omega_d=15.7$ rad/s and $kc=15$ MN/m.

From Figure 5, it can be validated that torsional controller will mitigate stick-slip only, and in order to eliminate bit-bounce an axial controller need to be designed and implemented to the system.

The closed loop simulation with axial and torsional controllers is presented in Figure 6. It can be noticed from that figure that both bit-bounce and stick-slip were eliminated resulting in smooth drilling conditions.

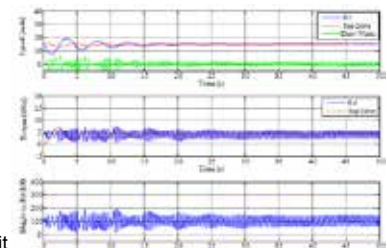


Figure 6: Final system simulations at $\omega_d=15.7$ rad/s and $kc=15$ MN/m.

CONCLUSIONS

Results have shown that the simultaneous presence of axial and torsional controllers can assure having smooth drilling conditions, thus increasing the life of drilling equipment and increasing the ROP (Rate Of Penetration).

ACKNOWLEDGMENT

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Microstructural and Hardness Heterogeneity in Al Alloys Processed by Accumulative Roll Bonding (ARB)

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Abstract

Accumulative roll bonding (ARB) is a severe plastic deformation process that is typically applied to sheet production of Al alloys to produce ultra-fine grained microstructure. The grain refinement enhances several mechanical properties such as strength and hardness. In this project, the effect of ARB has been examined on the microstructural refinement and hardness evolution of two aluminum alloys (commercially pure aluminum AA1100 and aluminum alloy AA6061). The results show that the use of 5 cycles of ARB reduced the grain size in AA1100 to 560 nm in rolling direction (RD) and 320 nm in normal direction (ND), while it decreased in AA6061 to 430 nm in RD and 220 nm in ND. In addition, hardness measurements at micro- and nanoscale show that AA6061 has stronger strain hardening and its hardness is relatively more dependent on contact depth (h_c).

Introduction

Accumulative roll bonding (ARB) is one of the major methods to produce ultrafine grain (UFG) metallic structure, having grain size in submicron level, in a bulk form using severe plastic deformation [1]. Fig.1 describes the ARB process where two small strips are wire brushed to increase the surface roughness and enhance bonding, and then stacked in top of each other and fed into the rolling machine to reduce the thickness by minimum of 50%. The rolls exert sufficient pressure that result in bonding of the two strips. The bonded strips are cut in two halves and ARB process is repeated for several cycles until specified amount of strain is achieved. Typically, UFG structure is produced after 5-9 cycles depending on the material.

Objectives

- To examine grain refinement by ARB for the two Al alloys.
- To study effect of ARB on hardness evolution at the micro- and nano-scale for both aluminum alloys.
- To evaluate the effect of strain hardening and contact depth on the evolution of hardness at nanoscale.

Methods

Strips of AA1100 and AA6061 were cut and wire brushed prior to ARB. A lab rolling mill was used to conduct ARB using 50% reduction in thickness per cycle. For each ARB cycle, two strips will be stacked to be 2 mm in thickness and then rolled. The procedure was repeated up to 5 cycles. Vickers microhardness indentations were made on ARB samples. Additional hardness evaluation was made using the nanoindenter machine available at the Nanotechnology Research Facility. SEM imaging was also used to evaluate the microstructure and to measure grain size in rolling direction and normal direction using method of mean intercept length .

Results

Fig. 2 & 3 show grain refinement after ARB processing for AA1100 & AA6061. As-received microstructure for both alloys has grain size between 10 to 20 μm , while it became less than 1 μm with increasing number of cycles. Measurements of mean intercept length show that average grain size after 5 cycles is 560 nm in RD and 320 nm in ND for AA1100, while it further decreased in AA6061 to 430 nm in RD and 220 nm in ND. Fig.4a plots Vickers microhardness (H_v) against ARB strain. The hardness of AA1100 (AA6061) increases from 44 (43.5) Hv for as-received samples to 63 (99) Hv after 5 cycles. The increase in hardness with number of cycles (ARB strain) is more effective for AA6061 demonstrating stronger strain hardening as compared to AA1100, where the latter alloy has higher dynamic recovery due to the high stacking fault energy. Similar trend is also shown in Fig.4b for hardness measurement using nano-indentation. The variation of hardness with contact depth (h_c) is plotted in Fig.5a for samples processed by 5 cycles. The slope for AA6061 sample is higher showing more dependency on h_c . Fig.5b demonstrates the stronger dependency of AA6061 on h_c with increasing ARB strain.

Conclusion

- ARB produced UFG structure after 5 cycles for both alloys.
- Strain hardening by ARB was more pronounced in AA6061.
- Nanoindentation measurements show stronger dependency of hardness on contact depth for AA6061 as compared to AA1100.

Acknowledgment

The authors would like to acknowledge Kuwait University funding project (GE 01/07) and College of Graduate Studies.

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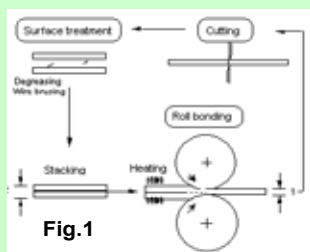


Fig.1 Schematic illustration for common steps used in Accumulative Roll Bonding (ARB) [2]

Fig.2: SEM micrographs of ARB AA1100: a) As received, b) 1 cycle, c) 3 cycles, d) 5 cycles

Fig.3: SEM micrographs of ARB AA6061: a) As received, b) 1 cycle, c) 3 cycles, d) 5 cycles

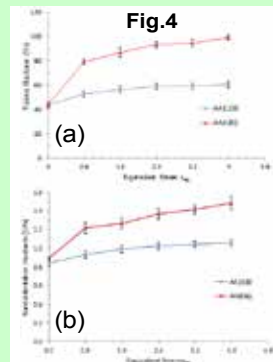
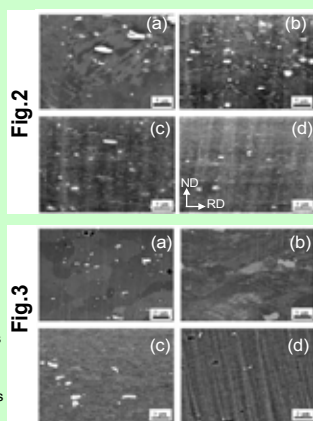


Fig.4: Average hardness vs. equivalent strain for AA1100 and AA6061 processed by ARB: a) Vickers Microhardness, b) Nanoindentation

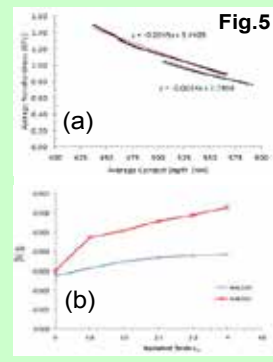


Fig.5: Hardness variation with indentation contact depth (h_c) using nanoindenter for ARB samples: a) H vs h_c , b) dH/dh_c vs. strain

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Recovery of Crude From OVL Pits in KUWAIT: A Successful Story

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Abstract

Weathered Crude Oils stored in open and unlined pits pose several environmental, safety and health issues to the flora, fauna and human population. The weathered crude oil could leach through the cracks and fissures in the ground surface contaminating the groundwater contribute to a higher concentration of VOCs and hazardous gases like H₂S in the atmosphere and render the soil unusable due to high concentration of petroleum hydrocarbons. Processing and Recovery of clean oil is possible through the use of complex technologies involving the use of mechanical equipment, chemicals and heat. By processing and recovering clean oil from weathered crude, it can be seen that the dangers of pollution posed to groundwater, atmosphere and the soil can be greatly reduced and removed. In addition to reducing the dangers to the environment, substantial revenues are also being generated which keeps the clean-up process self-sustaining.

This paper describes the successful recovery of 905,900 barrels from large waste oil pit that was estimated to contain approximately 1,000,000 barrels of Oily Viscous Liquid (OVL) out of which approximately 600,000 barrels were estimated recoverable crude. The process not only recovered 50% more than estimated recovery, yet this has helped to remediate and mitigate negative environmental impact and generated revenues for WJO. Between June 2011 and July 2014, the footprint of that pit has reduced by approximately 60% due to the cleanup efforts.

Introduction

As a result of the generation of various waste oils generated from crude oil recovery operations at Wafra Joint Operations (WJO), a number of large waste oil pits were created which contain on an average about 800,000 to 1,000,000 barrels of weathered Eocene and Ratawi crude per pit. The waste oils were originally stored into these open to air and unlined pits causing the loss of much of the light ends concentration due to evaporation, leaving a very low API gravity oily viscous liquid (OVL). The Wafra waste oil pits were formed by earthen walls raised above grade containing OVL for as long as 30 – 40 years. Over time, the OVL has become a complex multi-phase mixture of oil, water, sediments, wind-blown sand, debris, and emulsions with very few remediation and disposal options.

Various studies have shown that waste oils stored in open and unlined pits either from the remnants of the Iraq war (in 1990 to 1991) or due to the generation of off-spec material from operational issues, pose significant environmental concerns including soil contamination - affecting flora and fauna, groundwater contamination - affecting drinking water and irrigational water supplies and finally the atmosphere - affecting clean air. Additionally waste oils also affect human population either directly or indirectly by emitting hazardous organic compounds into the atmosphere or leaching into the ground water to render it unsafe for consumption or other purposes.

The Government of Kuwait and Environment Public Authority of Kuwait (KEPA) has required the eventual closure of these waste oil pits and a restoration of the impacted area to a reasonable and achievable level of ecological functioning.

Description

Oil and gas production operations generate significant volumes of waste streams like produced water; production rejects; tank bottoms; and waste produced during drilling, pre and post treatment, shutdown and maintenance operations.

Until 1999, it was an operational practice at WJO to discharge the process effluent and other waste streams into waste oil pits for evaporation. At one point in time, there were 60 such evaporation pits across the Wafra oil field area. Beginning 1999, as part of a zero discharge initiative, WJO closed most of the production sub-center pits. Only a few unlined pits near the Pressure Maintenance Plant (PMP) are in use. All of the evaporation pits at WJO are formed by earthen walls, are above grade, and unlined. Figures 1 and 2 show the layout of evaporation pits in WJO and the change in landscape over time (between 2006 and 2014).

The evaporation pits in WJO were filled with process effluent and waste streams over time. Some of the pits and the oily material in them is about 30 – 40 years old. Over time, the oils and other products in the pits stratify and can be broadly summarized as free/floating oil on the top, saline effluent water underneath, and oily sludge at the base as shown in Figure 3.

Analysis of the samples was performed by Kuwait Institute of Scientific Research (KISR) in Table 1. Potential migration of oil into the groundwater aquifer is a major environmental concern with a groundwater depth of 20m, possibility for oil migration is substantial. Also, Kuwait it is home to several migratory birds which may land and get trapped and die (see Figure 4).

A sophisticated OVL Plant has been constructed nearby the pit to conduct recovery process. It was estimated that Pit 28A contained 1,000,000 barrels of OVL out of which 600,000 barrels were Recycled Product and 400,000 barrels were water. After almost three years of process startup as of 1 July 2014, 1,420,000 barrels of OVL has been processed with 905,900 barrels recovered (50% higher than the estimated recoverable quantity) of Recycled Product and pump to WJO.

The treatment process is a very dynamic process since the incoming quality of weathered crude varies as the level of the pit goes down. The quality also varies due to time of the day, time of year, weather conditions and other environmental factors. The type of chemicals, dosage and operational parameters have to be constantly monitored and tweaked to ensure that recycled material always meets the customers specifications. At the end of the process, the pit size has been reduced by 60% as shown in Figure 5 and a reduction in footprint of Pit 28A between 2009 and 2014.

Conclusion

The encouraging result of this project would expedite cleanup of other OVL pits scattered in Kuwait, especially those resulting from Gulf war 1991 due to burned oil wells. This project helped in solving a long term environmental problem with revenue in return through oil recovering, as well as enhancing the footprint of the contaminated area. Given the proven track record of successfully recovering 905,900 barrels of recovered product from the OVL in JO, this remediation model is beneficial and viable and environmentally friendly solution and at the same time generating revenues for the end-users. As of 1 July, 2014, WJO recovered 905,900 barrels of Recycled Product from OVL in Pit 28A. This quantity is inclusive of diesel added to the process for dilution. Excluding diesel added, the Recycled Product recovered is 825,000 barrels. The original size of Pit 28A was about 83,000 m² in 2009. Since the processing of OVL commenced in 2011, WJO has been able to reduce the footprint of Pit 28A as and when the level of OVL has reduced due to the on-going processing and recovery operations. As of 1 July 2014, the size of Pit 28A was about 32,500 m².

Acknowledgement

I express my gratitude to Mr. Muhammad Boodai chairman of Bee'a wa Salama Company that has conducted the OVL recovery project for his help.

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Figure 1: Aerial view of Evaporation Pits as of 2006



Figure 2: Aerial view of Evaporation Pits as of 2014

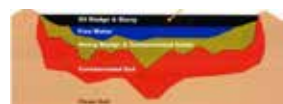


Figure 3: Typical cross-section of an Evaporation Pit



Figure 4: Photo of bird stuck in the oil



Figure 5: Pit 28A in WJO between 2009 and 2014

Sample ID	No. 10 Pit 28 N	No. 11 Pit 28 M	No. 12 Pit 28 S
pH	6.89	6.81	6.81
Density @ 40° C	1.0083	0.9945	0.9928
API Gravity	6.64	6.55	6.74
Viscosity @80° C	605.319	552.636	304.855
Viscosity @100° C	324.323	204.68	168.56
Pour Point	Not Possible	Not Possible	Not Possible
Flash Point	Not Possible	Not Possible	Not Possible
Total Sulfur %	3.096	3.316	3.224

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Eco Future of Energy Resources in Kuwait Until 2030: Reality and Ambition

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Abstract

Sustainable development has become first priority on the agenda of government of Kuwait, especially in fields that are related to environment protection and society including the development of integrated management systems for air quality, programs for the reduction of GHG emissions, the environmental compliance of oil companies through carefully planned programs, the wide use of renewable energy as the main source of power generation, all provide a compelling evidence of the firm commitment of the State of Kuwait towards the sustainable development of its society and the protection of its environment.

Introduction

The Ministry of Electricity and Water (MEW) provides the country with its needs from electrical power and fresh (distilled) water supplies through five Power and Desalination Plants (PDPs) built along the Kuwaiti coastline. All plants are mainly fueled by the relatively cheap heavy and high Sulphur content fuel oil, and hence provide a source of air pollutant emissions, particularly Sulphur dioxide (KEPA, 2002).

Kuwait has one of the highest power and fresh water consumption rates per capita in the world. However, Kuwait is currently facing rising energy and fresh water demands. The estimated total additional power load and the amount of water required for the State projects of up to 2020 are 10,000 MW and 250 MIGD, respectively. Consequently, the Kuwait Government by plans to double the installed capacity to 30,000 MW of electricity and 1,000 MIGD of water 2030, with the challenge of reducing air pollution in adhering to HH the Amir commitment to the Climate Change Convention Summit on Doha 2012.

This research tries to investigate the alternative energy resources suitable for Kuwait to meet the commitment of 2030 on environmental friendly ground

Discussion

Kuwait is no change than GCC countries in daily life style that is reflected in high consumption rate per capita of electricity, Figure 1 shows a sharp increase in electricity demand compared with fluctuating oil production increase. This was one of the motivations factors that drove Kuwait to start thinking in diversifying energy resources which will lead to oil reserve conservation, other facts are summarized in Figure 2. The corner stone in this project was the commitment of HH the Amir to UNFCCC summit on Doha, 2012 (Figure 3). Figure 4 shows that renewable energy would be perfect choice to Kuwait since electricity peak demand lasts only for 45 days during hot dry summer.

As planned by the government, 145 MW should be in service in five years from 2010, and all possible methods have been studied, Figures 5 through 7 summarized it all. Figure 8 was a very optimistic projection which is realized later. Nuclear power option was omitted due to Fukushima disaster, all efforts focused on renewable rather than alternative energy resources, illustrated in Figures 9 and 10. Figure 11 shows that Kuwait has high potential of solar and wind power, therefore, there two options have been chosen to satisfy the 15% commitment.

Conclusion

Kuwait can not work alone to reach the 15% goal, NGO and other stakeholder in the community have to take part of this challenge using the roof top solar which will contribute by 1000 MW by 2030. Using Figure 11, west Kuwait is been located to host the solar and wind power projects. As illustrated in Figures 12 through 14, Shaqaya project is expected to enter the electrical grids in two years with 70 MW. Abdaleya should add another 50 MW, this capacity has been shifted from year 2015 to 2018 therefore is it critical for the community to take part in order to reach 4500 MW, 15% of the projected capacity in 2030.

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Figure 1



Figure 9



Figure 2



Figure 10



Figure 3

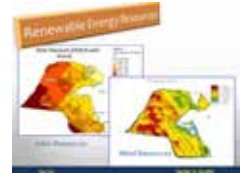


Figure 11



Figure 4



Figure 12



Figure 5



Figure 13



Figure 6



Figure 7

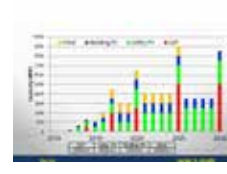


Figure 8



Figure 14



ANALYSIS OF PRECONDITIONING EFFECT ON POLYMER STABILITY IN ROCK USING X-RAY CT

Abdullah Alajmi and Meshal Algharaib
Petroleum Engineering Department

Abstract

This work investigates the preconditioning effect on the polymer stability in high salinity reservoir. The effect of preflush on the integrity and stability of polymer slug was monitored and quantified by X-Ray CT imaging.

Experimental Work

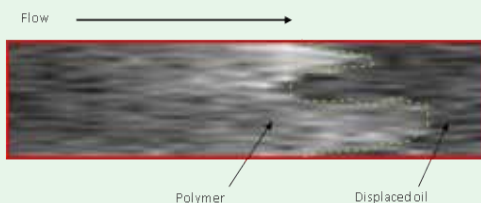


viscometer

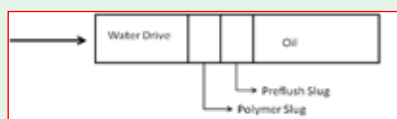


X-ray CT Scanner

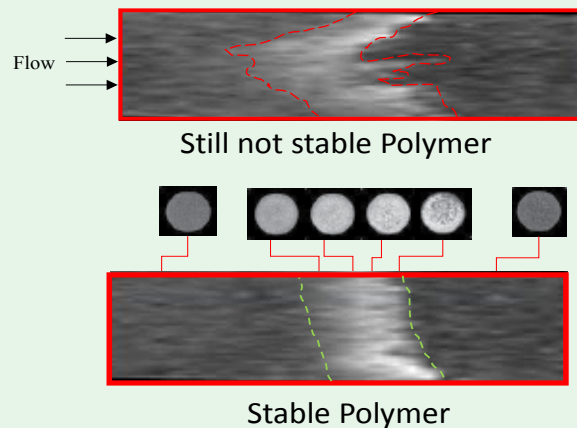
Problem: not stable polymer due to high reservoir salinity.



Solution: inject preflush with lower salinity to help in the stability of polymer.



Results



Conclusion

The stability of polymer slug was quantified. As the preflush slug salinity decreases, the polymer slug become more stable. Larger preflush slug size led to fingering and instability of the preflush slug. Preflush with higher viscosity contributed to a good preflush slug sweep. .

Acknowledgements

The Authors would like to thank Kuwait University Research Administration for supporting this project.



Water Control Management Utilizing Downhole Water Sink Technology: Application of A Reservoir in the Middle East
ENG. Nasser Hadi Alazmi & Dr. Faisal Abdullah Aladwani
Petroleum Engineering / College of Engineering and Petroleum

Abstract

Water plays an important role in the oil and gas industry. Water production increases worldwide as more reservoirs depleted over time. Managing the subsurface water conformance has positive effects in maximizing hydrocarbon production and reducing the operating expenses that expected mainly from the unwanted water production. On the other hand, ignoring such a problem could decrease hydrocarbon production and lead the well to be producing uneconomically. At the beginning of the well life, water will enter to the production stream. It is important to identify the water source in order to solve any problem related to the unwanted water production. Once the mechanism of the water production is understood, an effective strategy can be formulated to detect and control water-related problems. Different techniques and methods have been developed in order to determine and control water-related problems. Production logging tool (PLT) and Chan's WOR diagnostic plot are the common methods for determining if the water problem present or not as well as to analyze the causes of the unwanted water production. Recently, downhole water sink (DWS) completion is a new technique using dual completion to control the unwanted water production in wells with bottom water drive. DWS wells contain two completions; the bottom completion produces water to the surface while the top one is open for oil flow.

A large variety of chemical and mechanical water control technologies are available to mitigate the problems related to the unwanted water production. These technologies not only prevent or reduce water production; they also increase hydrocarbon production and extend the reservoir lifetime. The aim of this study is to evaluate DWS technology performance in vertical oil wells with severe water coning history of a reservoir in the Middle East area. In addition, economic analysis results obtained by comparing the conventional wells versus DWS wells to investigate the effect of DWS in reducing the water production and increasing the oil production. Results showed that the DWS completion minimized the water production by 18% and enhanced oil production by 26% compared to the conventional wells performance.

Introduction

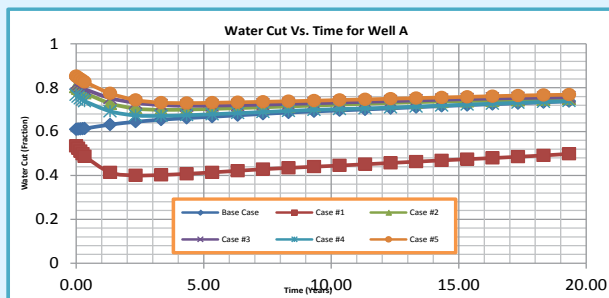
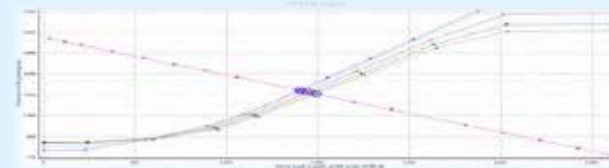
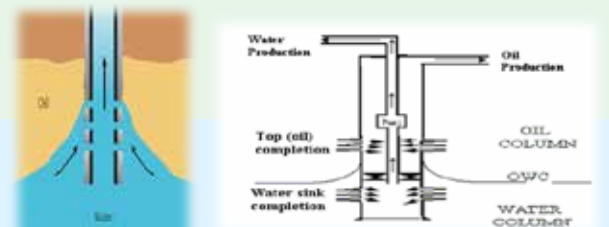
Excessive water production is considered as a serious problem in oil-producing reservoirs. Several oil companies could be called water companies because of the increasing of the water production rates. Worldwide daily water production is around 300 million barrels compared with 80 million barrels of oil, which means that oil companies produce almost three to four barrels of water for each one barrel of crude oil from their depleting reservoirs. This number of water production is expected to exceed 350 million barrels per day in 2020. Therefore, treatment and disposal of water has been estimated to be about \$55 billion/year by taking expenses of water disposal and treatment about 0.5\$/bbl. Reservoir rocks mainly contain both petroleum hydrocarbon and connate water. Water aquifers provide an extra drive mechanism to produce the oil from the reservoir, but it can create production problems in the wellbore. This water may be called connate, interstitial or formation water but it is commonly referred to as produced water. Managing this produced water is a great challenge for oil companies. Water production effects are reflected in every stage of oilfield life, during drilling, though development, and production. As long as the water production rate is below an economic level of water oil ratio (WOR), there is no need for any water control techniques or methods. Understanding the mechanism of water production is mandatory for controlling the water production issues. Additionally, many factors indicate the source of flowing water and these factors should be detected to understand producing water source. Finally, determining the causes of the water production problems can lead oil companies to maximize reservoir productivity and to innovate several water-control methods to minimize the high expenses. Each cause or problem requires a different approach (or technique) when trying to find the most optimum solution. Recently, some Middle Eastern reservoirs suffer from excessive water production problems. At early well's life, water is not expected in the production stream. During the high amount of hydrocarbon production, water will start growing up causing water coning, therefore, water could be produced with excessive amounts and that affects the revenue that comes from the hydrocarbons due to additional water treatment expenses. The reason in producing water with this excessive amount is that for many wells drilled, oil is producing above the economic limit (the limit at which oil production rates for the individual well can't cover the total operating expenses) and causing a sharp acceleration of water coning issues. The purpose of this research is to study the effects of the excessive water production on the oil industry and to provide some of the widely solutions used nowadays for this phenomenon. Moreover, the main purpose of this thesis work is to study the feasibility of a new technology called downhole water sink (DWS) completion by building a numerical simulation model and to evaluate the DWS performance in high water-producing wells for a sample reservoir located in the Middle East area. Recently, DWS completions has been tested and proved in many wells to succeed in minimizing excessive water production and eventually increasing oil production rates.

Objectives

- Evaluate DWS technology performance in vertical oil wells with severe water coning history of a reservoir in the Middle East area.
- Perform Economics analysis to compare DWS wells with the conventional wells.

Methods

- Water Oil Ratio and Its Derivative with Time Plots (Chan Plots).
- Production Logging Tool & Saturation Log (Reservoir Saturation Tool).
- Downhole Water Sink Completion (DWS).
- Reservoir Simulation (ECLIPSE-100).



Results

- The results obtained showed that completing the wells that have high water cut with DWS completion could have a valuable effect in increasing the oil production and minimizing the unwanted water production.
- The results showed that completing the selected reservoir wells with DWS completion has a positive economic impact than leaving the well producing high rates or using routine technique such as water shut off that will affect the wells later.

Conclusion

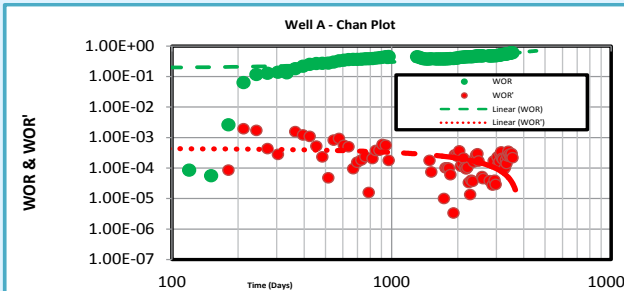
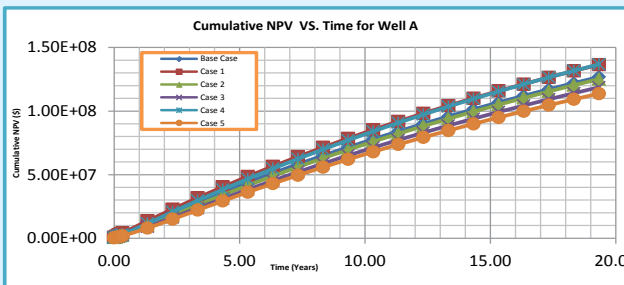
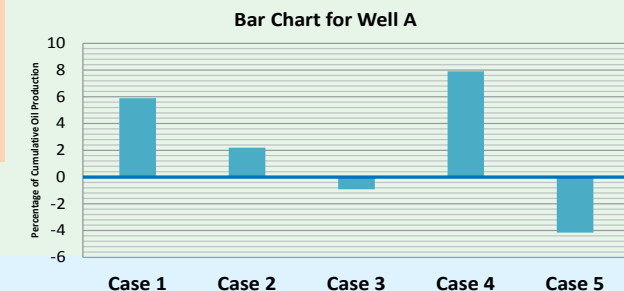
- Increase in Recovery is attained with DWS completion over conventional perforation.
- Chan Diagnostic Plots of WOR and WOR' time derivative have a great impact in determining the types of water problems.
- Water coning problems for the selected Middle East reservoir wells are controlled after completing these wells with DWS technology.

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Acknowledgements

- Kuwait University.
- Kuwait Oil Company (KOC).



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Life Sciences





The Effects of Market-Oriented Price Signals for NOx and CO₂ on Emissions from the Power Generation System

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Center for Energy and Environmental Resources, The University of Texas at Austin

The Problem

- To date, the impacts of the pricing of NOx and CO₂ on power system emissions have only been examined separately.
- This study examines the impact on emissions rates of changes in emissions prices for both NOx and CO₂.
- We simulate scenarios in which:
 - Prices were imposed on NOx emissions alone.
 - Prices were imposed on CO₂ emissions alone.
 - Prices were imposed on both emissions.

Motivation

- Different electricity generation units have different profiles of NOx and CO₂ emissions per MWh of electricity generated.
- Imposing price signals for NOx and CO₂ emissions causes shifts in the merit order of facilities:
 - Lower the merit order of high NOx and CO₂ emitting facilities relative to low NOx and CO₂ emitting facilities.
 - As a result, shift the generation away from high emitting facilities.

Methods

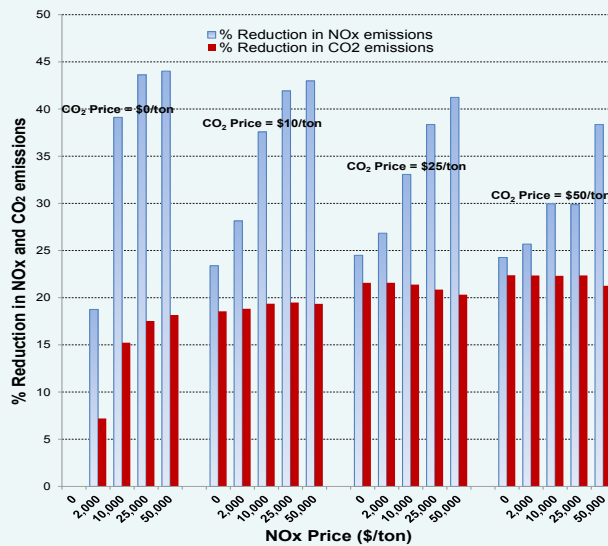
- Developed an integrated infrastructure to allow air quality, water and power system models to exchange information in a transmission and demand constrained grid.
- Modeled electricity dispatching for the highest demand day in 2008 using an optimal power flow model, PowerWorld Simulator.
- Simulated pricing policy scenarios:

NOx emissions prices	CO ₂ emissions prices
1. \$0/ton	1. \$0/ton
2. \$2,000/ton	2. \$10/ton
3. \$10,000/ton	3. \$25/ton
4. \$25,000/ton	4. \$50/ton
5. \$50,000/ton	

Results

A. Reductions in NOx and CO₂ emissions rates

- Market-based environmental pricing has the potential to simultaneously reduce NOx and CO₂
- Reductions in NOx emissions rates ranged from 76 to 177 (ton/day).
- Reductions in CO₂ emissions rates ranged from 47,300 to 147,000 (ton/day).

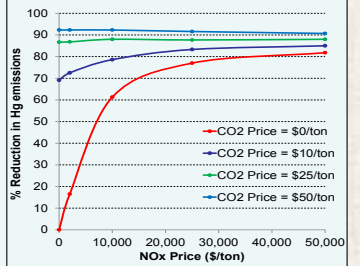
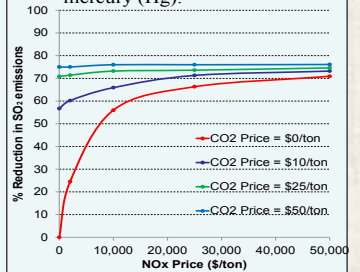


Observation:

- There are some trade-offs between NOx emissions and CO₂ emissions prices.
- Increased prices of CO₂ reduce the maximum NOx reductions that can be achieved compared to scenarios with no carbon price.

D. Co-benefits

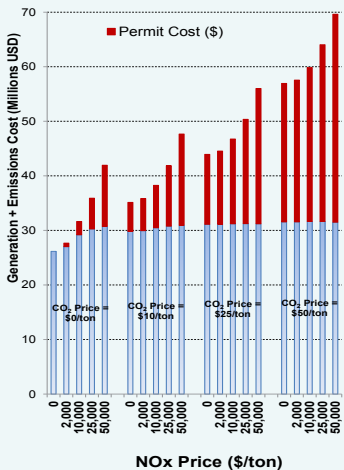
- Co-benefits to redispatching of generation
 - Reductions in the emissions of sulfur oxides (SOx).
 - Reductions in the emissions of mercury (Hg).



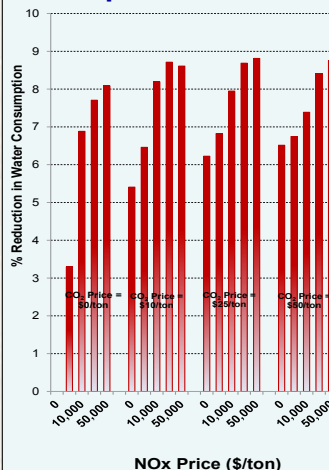
(a) SOx reductions ranged from 57.5 to 195.4 (ton/day).

(b) Hg reductions ranged from 4.7 to 18.1 (lb/day).

B. Emission Pricing and Generation Costs



C. Reductions in Water Consumption



Conclusion

- Market-based dispatching with environmental price signals can reduce emissions and water use simultaneously in electricity generation units.
- Maximum NOx and CO₂ reductions achieved over the 24 h period: 44% and 22.4%.
- Electricity redispatching can reduce total water consumption by as much as 49 to 132 (x1000 m³/day).
- Co-benefits associated with increase the cost of NOx and CO₂ emissions which include reductions in SOx and Hg emissions.
- Reductions of NOx and CO₂ emissions can be achieved for an increased generation cost of 3–21%.



Assessment Study of Environmental Impacts of Desalination Plants on Kuwait's Marine Life

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Abstract

Despite extreme climatic conditions, Kuwaiti waters support a range of coastal and marine habitats such as coral reefs, mud and sand flats and mangroves. They are considered as one of the highest anthropogenically impacted regions in the world. Reclamation and dredging, industrial discharge, sewage effluents, brine discharge from desalination plants and oil pollution are the major environmental stressors. The International Union for Conservation of Nature (IUCN) and the World Wildlife Fund (WWF) identified the Arabian Gulf, which includes Kuwait coast as “critically endangered ecoregion”. The study is an effort to assess the impacts of desalination plants on Kuwait's marine biodiversity.

Introduction

Desalination plants are progressively being installed, especially in water stressed arid and hyper-arid countries of GCC, where desalination of sea water remains the most feasible and reliable source of fresh water to meet all the domestic and industrial requirements. The Arabian Gulf is recognised as a ‘Hot Spot’ of intense desalination activities, supporting around 45% of worldwide desalination capacity. Despite the various benefits, it also offers potential negative impacts on the environment. Those key issues are associated with the concentrate and chemical discharges to the marine environment. This concern significantly rises when the concentrate is discharged to Arabian Gulf, a subtropical-tropical marginal sea, where water exchange with an open sea is restricted.

KUWAIT'S Marine Biodiversity

Primary Productivity – 152.9 µgC/l/d
Photosynthetic Efficiency – 15 – 25 µgC/h

Habitats – Mudflats, coral reefs, mangroves, seagrass beds

Phytoplankton Density – 3098 – 1,821,655 cells/litre

Diatoms – 134 species
Dinoflagellates - 86 species
Blue green algae - 2 species
Silicoflagellates - 1 species

Zooplankton Biomass: 0.14 – 0.86 g/m³

Hydromedusae - 26 species
Copepods - 40 species
Chaetognaths - 7 species

Pearl
Rayed Pearl Oyster (*Pinctada radiata*)
Black – lip Pearl Oyster (*Pinctada magritifera*)
Wing Oyster (*Pteria penguin*)

Fishries
14 commercial fishes – *Pampus argenteus*, *Tenulosa ilish*, *Pomadasys kakkkan*, *Epinephelus coioides*, *Lutjanus malabaricus*, *Otolithes ruber*, *Acanthopagrus latus*, *Liza klunzingeri* etc.

Mitigate Measures

Design and modification in the discharge and dilution methods

- ❖ Introduction of multiport diffusers for better nearfield dilution
- ❖ Application of farfield models (Transient Plume Model, Arabian Gulf Model and Delft3D) to monitor discharge criteria
- ❖ Introduction of advanced technologies ICP, PRO for brine treatments
- ❖ Promoting fish sanctuaries by introducing reef balls and other artificial support materials

- ❖ Higher levels of Cadmium, Copper, mercury, vanadium, iron, phosphorous and zinc in benthic sediments
- ❖ Elevated levels of copper in clams, mollusks and algae
- ❖ Alteration in the structure and diversity of softbottom benthic organisms – domination of nematodes over polychaets
- ❖ Reduction in diatom distribution and decrease in chlorophyll 1a concentration
- ❖ Decrease in growth and survival of the sea grass, *Posidonia oceanica*
- ❖ Enhanced calcification and coral bleaching



Environmental Impacts

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Application of PRO for assessing power generation from wastewater treatment plants in the state of Kuwait

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Abstract

Discharge from desalination plants of Kuwait returns brines of high salinity to the Gulf that contain other contaminants, such as chlorine or chromium, impacting the environment of the coastal region. Conversely, wastewater discharges to the Gulf have low salinity but may drive eutrophication of coastal waters. Pressure retarded osmosis (PRO) is a promising source of renewable energy and an emerging membrane based technology for recovering energy from concentration differences between water streams. The proposed work examines the feasibility of using PRO to generate energy from wastewater and desalination plants in Kuwait by calculating the power density using a PRO zero-dimensional model. The model accounts for concentration polarization (CP) and salt permeability coefficient (B) effects to produce realistic results. The effects of CP and B on the power density at varying applied pressures and varying concentration differences between the feed and draw solutions are studied. Case studies on the potential re-use of treated wastewater effluent (TWE) and brine reject streams from three wastewater treatment plants (WWTPs) in Kuwait are discussed and compared to determine the maximum power generated from each of the WWTPs.

Introduction

Water scarcity, over population and environmental degradation has stressed the water table to an extent that the 21st century has been nicknamed as the 'century of water'. This crisis has resulted in the depletion of water resources and has limited the availability of fresh water to 0.8% of the earth's total water resources. The advent of renewable energy has taken the world on a path toward sustainable Consciousness. In the world of hydroelectric generation systems, the use of salinity gradient energy has the highest energy concentration and can produce approximately 1650 TWh every year, making it a viable source of electricity. The concept of extracting energy from water salinity was developed as early as the 1950s. Harvesting energy by mixing freshwater with seawater was first reported in an article in *Nature by Pattle in 1954*.

Pressure retarded osmosis (PRO) could be a viable source of renewable energy. In a PRO system, water from a low salinity feed solution permeates through a membrane into a pressurized, high salinity brine/draw solution.

Power is obtained by depressurizing a portion of the diluted seawater through a hydro-turbine. Membrane characteristics and operating conditions contribute towards water flux and power density. Concentration polarization and salt leakage reduces water flux and power density in PRO.

The introduction of PRO into the desalination systems of the Gulf countries could potentially mitigate the environmental impacts of the brine discharge from desalination. With a total capacity of 11 million m³/day, the desalination capacity of the Gulf region is the highest in the world.

Objectives

✓The current study investigates the implementation of a zero-dimensional model to calculate the power density employing a PRO system.

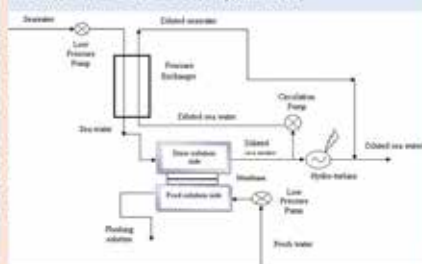
✓The model incorporates the effect of concentration polarization (CP) and salt leakage (B) to produce more realistic results for power densities. The potential use of TWE from selected wastewater plants (WWTPs) and reject brine waste streams from MSF desalination plants to generate energy using a PRO system in the State of Kuwait has been investigated.

✓In the proposed PRO system, a difference in osmotic pressure drives pure water from a low salinity feed solution, TWE, to permeate through a selectively semi-permeable membrane that only allows water molecules to migrate.

✓The limits of the PRO zero-dimensional model were also studied at high osmotic pressure ($\Delta\pi$) and hydraulic pressure (ΔP).

Experimental

The experimental details are per [Achili et al.]



Conclusion

✓The enhancement of membrane characteristics and optimization of conditions could improve the generation of power from PRO plants.

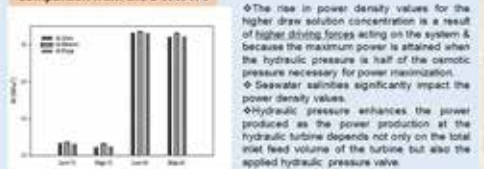
✓At higher dilution the effects of CP and B are almost negligible.

✓The power density from the Al-Haiman WWTP (18.73 W/m²) is the highest compared to the other two WWTPs.

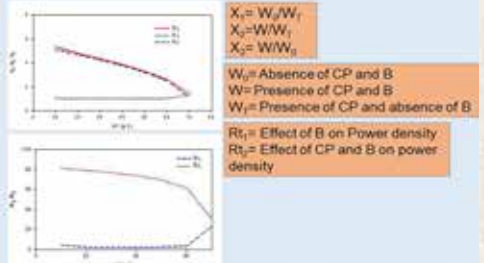
Results



Comparison from the 3 WWTPs



✓The comparison of power densities calculated for each of the three wastewater treatment plants, Al-Jahra, UM Al-Haiman and Al-Riqqa, in the state of Kuwait.
 ✓The results reveal that the highest power density value is recorded for the Al-Haiman WWTP (18.73 W/m²), which is slightly higher than the values measured for the Al-Jahra (18.68 W/m²) and Al-Riqqa (18.66 W/m²) WWTPs.



◊ Concentration polarization (CP) and salt leakage (B) reduce the driving forces as well as the water flux across the membrane.
 ◊ With increasing dilution the CP and B effects becomes nullified as the lines meet each other and this observation concludes that power production would increase when both the CP and B effects are nullified.

Zero Dimensional Equations

The following equations are used to validate the model and also to estimate the power densities in each of the treatment plants in Kuwait.



$$J_w = A(\Delta\pi - \Delta P) \quad W = J_w \times \Delta P = A(\Delta\pi - \Delta P)\Delta P$$

$$K = \frac{t \times \tau}{D \times \epsilon} \quad k = \frac{ShD}{d_b} \quad B = \frac{A(1-R) \times (\Delta P - \Delta \pi)}{R}$$

$$J_w = A \left[\pi_{d,b} \exp\left(-\frac{J_w}{k}\right) \times \frac{1 - \frac{\pi_{f,b}}{\pi_{d,b}} \exp(J_w K) \exp\left(\frac{J_w}{k}\right)}{1 + \frac{B}{J_w} [\exp(J_w K) - 1]} - \Delta P \right]$$



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Energy and Environmental Discharges of Plastic, Recycled and Bio-Degradable Bags: An Environmental Perspective for the State of Kuwait

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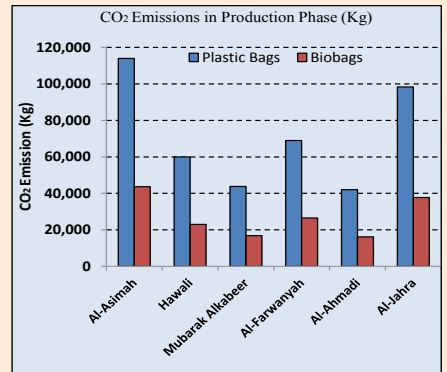
Abstract:

The purpose of this study is to:

1. Measure carbon footprint (Kg of CO₂ emissions) of Plastic, 50% Recycled, 100% Recycled and bio-degradable bags.
2. Estimate energy consumption (MMBTU) of Plastic bags.
3. Estimate total cost (KD) of the production phase of plastic bags.

Results:

- CO₂ emissions from using plastic bags in Kuwait cooperative societies range from 18,000 to 50,000 Kg per month.
- The percentage of reduction that can be achieved for CO₂ emissions is:
 1. 62% for Bio-degradable bags.
 2. 42% for 100% Recycled bags.
 3. 20% for 50% Recycled bags.
- Sultan center has the greatest CO₂ emissions in Kuwait (270,000 Kg/m).
- Monthly cost of Plastic bags ranges from 27,000 to 9,000 KD.

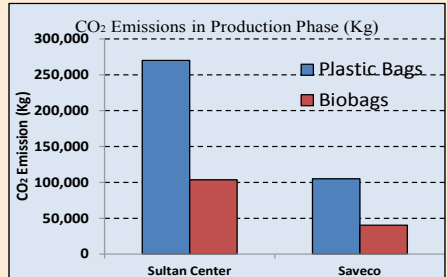
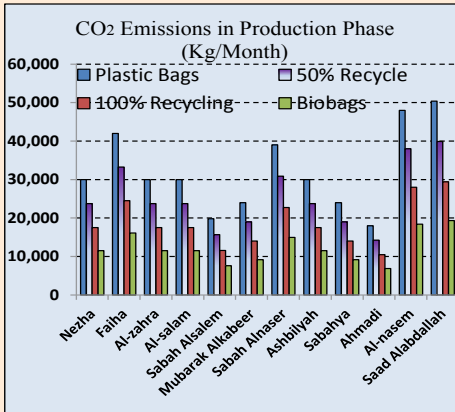


Motivation:

Why not considering paper bags?

- Paper bags generate 70% more emissions, and 50 times more water pollutants than plastic bags.
- Plastic bags use 40% less energy to produce and generate 80% less solid waste than paper.
- Even paper bags made from 100% recycled fiber use more fossil fuels than plastic bags.

Paper bag has more negative environmental impacts.

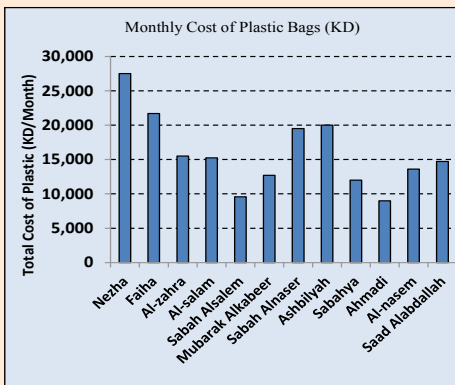


Conclusion:

- Saad Alabdallah cooperative society has the highest CO₂ emissions, while Al-Ahmadi has the lowest emissions.
- Using Bio-degradable bags is the most cost-efficient scenario for reducing environmental impacts.
- Low recycling rates for plastic bags prove recycling them does not work efficiently.
- Plastic bags account for more than 40% of a landfill's contents.
- Bio-degradable bioplastic also offers advantages over its energy consumption.

Methodology:

- Data were collected from different cooperative societies that covering all governorates of Kuwait.
- The environmental footprint of Sultan Center and Saveco were also estimated and compared with those from cooperative societies.
- The production of 1 kg of polyethylene (PET or LDPE), requires the equivalent of 2 kg of oil for energy and raw material.
- Per kg of plastic, about 6 kg carbon dioxide is created during production and incineration processes.



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How Organic is the Local Agricultural Farms? Assessment of Four Vegetables Crops and Public Perception in Kuwait

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Abstract
Kuwait is one of the few countries in the world that depend entirely on food imports for food security, with all risks associated with complete dependency on food imports due to international and regional security concerns. Local farmers are adopting organic agriculture on a growing scale with little experience and absence of well-defined standards against which the quality of their products can be measured. This study is designed to investigate the organic farming in Kuwait by comparing the organically grown vegetables with conventional grown vegetable samples. Findings indicated lower TP and higher TN in the organic than in conventional vegetable samples. High concentrations of heavy metals (As, Pb, Cu and Zn) under organic crops while conventional crops showed lower concentrations in the heavy metals contents. Organic crops contained lower concentrations of Fe and Mn compared to conventional crops. These findings contradict with the findings of previous studies.

Introduction
Locally, Middle East countries are challenging food security mainly for increased population, water scarcity and climate change[1]. Among the countries of Middle East, Kuwait has been achieving low level of self-sufficiency food production, and depends on importing food [1]. The condition of wealth in Kuwait enables the country to achieve stable food supplying, hence, Kuwait is classified as High income, nonOECD country [2]. Fresh vegetable such as leafy vegetables, tomatoes, cucumbers, lettuce, and bell pepper are the main agricultural products in Kuwait [3]. Recently, few farmers in the State of Kuwait have started practicing organic farming methods. Experiencing a new method of farming in Kuwait is mainly motivated by the perception of the benefits of organic agriculture on human health and environment. Many studies discussed the nutritional values and differences between organic and conventional food agriculture; nevertheless, no previous study has been done on organic food in Kuwait. The primary objective of this study is to investigate locally grown organic and conventional crops in term of Total Phosphorus - Total Nitrogen - Iron - Manganese as an indicator for food quality, and Arsenic - Selenium - Lead - Copper - Zinc to evaluate the safety issues. The study is complemented with a public survey to investigate the public perception about growing and consuming organic food as opposed to conventional grown foods.

Material and Methods
Four different crops were included in this study for the purpose of comparison. The study compares between conventional and organically grown (Cabbage - Broccoli - Lettuce and Roca). Selection of the crops was based upon availability in both farms. Samples were selected to combine results and average for all samples were taken for each element in the analysis. On-site sampling, crops were cut 5 inches away from the roots. All samples were collected between February to March of 2015. Selection of the samples was based on the availability in the gardens, farms and retail market. The sample size was at least one kg for small and medium-sized fresh products. Samples were weighed to around 250 g, and stored in empty glass containers for freeze-drying. Samples were analyzed for: 1) Total Phosphorus (TP) concentrations using (FIA) instrument, 2) Total Nitrogen (TN) concentrations using (LECO TruSpec CHNS-282) instrument, 3) Iron (Fe) and Manganese (Mn) using (ICP) analyzer, 4) Arsenic (As), Selenium (Se) and Lead (Pb) using (ICP), 5) of Copper (Cu) and Zinc (Zn) using (ICP) analyzer.

Result and Discussions
Organic lettuce contained the highest amount of TP in contrast, concentrations of TP were higher in the conventional than in organic samples of Cabbage, Broccoli and Roca crops. Concentrations of TP in the organic crops did not exceed 4000 mg/kg except for organic lettuce where the concentration of TP reached 6641 mg/kg exceeding the content of TP in all other conventional samples. The average content of TP in conventional and organic crops was 4605.43 mg/kg and 394.54 mg/kg, respectively. TN was higher in conventional Cabbage and Broccoli, while it was found higher in organic lettuce and Roca (Fig.1). The average content of TN in organic crops (4.10%) was higher than in conventional crops (3.80%), respectively. In this study, organic crops were found to contain higher TN than conventional crops. For the organic crops, highly content of TN indicates intensive use of organic fertilizers (compost and manure); another reason is that two of the organic farms were using harvesting fish's water in irrigation that can be rich with nutrients including TN.

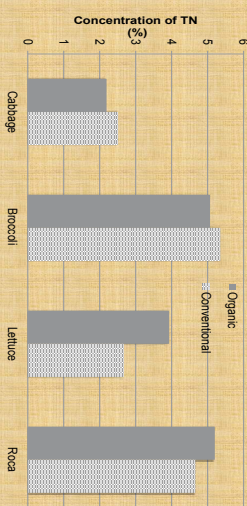


Fig 1. Concentration of Total Nitrogen in organic and conventional crops

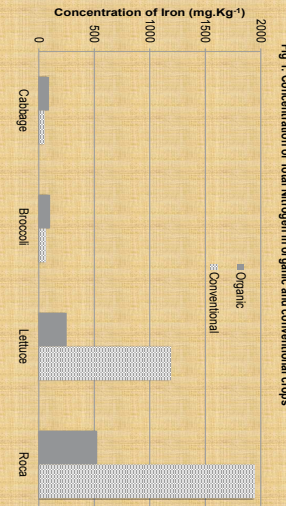


Fig 2. Concentration of Iron in organic and conventional crops

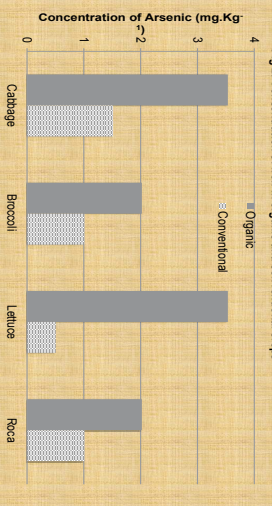


Fig 3. Concentration of Arsenic in organic and conventional crops

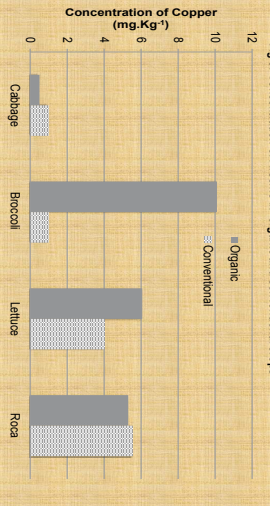


Fig 4. Concentration of Copper in organic and conventional crops

Conventional Roca contained the highest amount of Fe, followed by the conventional lettuce. While the content of Fe in Cabbage and Broccoli samples are relatively similar (Fig.2). On average, content of Fe was found almost threefold higher in conventional crops (814.77 mg/kg) than in organic crops (242.42 mg/kg). Roca samples contained the highest amount of Mn among other samples; conventional Roca showed higher concentration (81.37 mg/kg) than organic Roca (50.25 mg/kg). On the other hand, Mn in organic Broccoli was almost two times higher than in conventional Broccoli. The average content of Mn was (43.75 mg/kg) in the conventional crops, while it was (36.55 mg/kg) in organic crops.

Concentrations of As were found higher in all tested organic crops than in conventional (Fig.3), as the average content of Arsenic in the organic crops was (2.78 mg/kg), compared with the conventional crops was (1.01 mg/kg). Conventional Cabbage and Roca contained higher amount of Se than in the organic crops while Se content found higher in organic Broccoli. Organic and conventional lettuce samples contained similar amount of Selenium. The average content of Se was similar in organic and conventional crops (3.79 mg/kg) and (3.91 mg/kg) respectively. Pb content was detected in organic lettuce and Roca followed by conventional lettuce. On average, content of Pb was found higher in organic crops (0.82 mg/kg) than in conventional crops (0.44 mg/kg). It was noticed that organic lettuce contained the highest concentrations of As and Pb and contain similar concentration of Se in the conventional lettuce, although organic lettuce and Broccoli were collected from the same farm.

This indicates the different responses of metals absorption reliance on vegetable type. Organic Broccoli showed no detection of Pb as well as Conventional Broccoli. Accumulation of heavy metals in the organic crops samples contradicts with studies that indicate lower concentrations of heavy metals in organic food. This suggesting a potential source of contaminated soil with heavy metals in the practiced local organic farming. The increase of heavy metals content could be related to the high content of TN in the organic crops and that assumption enquiring if the farmed soil is being treated previously with chemical fertilizers. Considering the vast pollution that was caused by burning oil wells, Kuwait's soil might still contains high level of toxicity.

Organic Broccoli indicated to contain 10.10 mg/kg of Cu, almost 10 times the amount of Cu in the conventional Broccoli (Fig.4). The average content of Cu was found slightly higher in the organic crops (5.49 mg/kg) than in the conventional crops (2.90 mg/kg). All tested samples were below the toxicity level of Cu concentration. Zn was the most abundant metal in entirely crop samples with the following order: Cabbage > Broccoli > Lettuce > Roca. The average content of Zn in organic and conventional crops were (85.54 mg/kg) and (78.54 mg/kg), respectively. Studies has revealed no significant differences in minerals between organic and conventional crops including Zn and Cu).

Conclusions
Local agriculture has the potential to produce sustainable food production system with the help of modern technology that enhances water resources availability and use, as well as soil amendments. This goal is attainable with elaborate efforts of scientific research. Inconsistent results with what farmers thought was organic farming practice was to be expected. Obviously, applying the standard of organic agricultural is not enough to achieve organic production. This study investigates the current status of local agriculture and evaluates the difference between organic and conventionally grown commonly used vegetable crops. Our results revealed higher concentrations of TN, As, Pb, Cu and Zn under organic crops than conventional crops, as well as over TP, Fe and Mn in organic crops, which a sharp contrast with the findings of previous studies. While farmers perceive their production to be contaminant-free, many aspects appear to be meticulously such as neglecting soil history. This can be found through analyzing the farm's soil.

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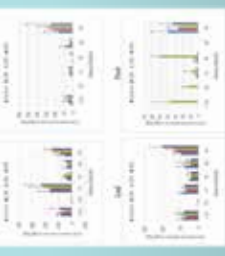
Abstract

Heavy metals can enter food chain through the uptake by plants from soil, and finally end up in human. High concentration of heavy metals in sludge is therefore one of the major obstacles limiting its agricultural application. Testing sludge quality is an important step that is achieved by applying several tests such as detection heavy metal. This study was intended for determining the suitability of using sewage sludge resulted from treated wastewater from Al-Raqqa plant in Kuwait in agriculture as fertilizer. Experiment measure this heavy metal concentration in soil, leachate and different part of plant at different stage of experiment. Results shows that root and leaf absorbed more metal and heavy metal, while stem and tomato fruit have less concentration of them. Results confirmed that Kuwaiti sludge is after treatment was within the standard limit and experiment proven its suitability for usage and there is no associated risk of using it in agriculture.

Material and Method

The sludge used in this study was collected from a local municipal wastewater treatment plant (Al-Raqqa). A greenhouse experiment was established consisting of 12 pots. There were four treatments: control (soil without sludge), soil with 10%, 20% and 30% of sludge added. Each treatment was replicated three times. Tomato was grown in the pots and randomized periodically. Soil and leachate samples were collected after each irrigation event. Plant samples were also collected from different parts of the crop (leaf, stem, and roots). To determine total metal (Fe, Mg, Al, Cd, Cu, Cr, Ni, Pb, Zn) concentration in the leachate, soil, and plant parts, the samples were dried at 105°C, digested in a microwave oven (MARSXpress, CEM, USA). After cooling, the extracts were filtered through Whatman 42 filter papers and analyzed by atomic absorption spectrometer (Varian AA280FS).

Fig.2. Average concentration of heavy metals in different parts of plant



Most heavy metals detected in whole plant parts except fruit where its not all detected there. Results record more concentration of it in root while the least was in fruit. Zn, Ni and Cr are just the three heavy metals appear in all parts and all treatments. Zn as an example was detected in low concentration in tomato fruit as (2594 - 3943 mg/Kg) and more in stem (80 - 144 mg/Kg), Ni concentrate more in root (11 - 53 mg/Kg), and in a very little concentration in fruit (0.8 - 51 mg/Kg). Cr concentrate more in root (1.61 - 233 mg/Kg) while the least concentrations found in fruit (1.5 - 8.8 mg/Kg).

Conclusion

This study is aimed to investigate the suitability of using sewage sludge in agriculture by measuring heavy metal concentration in different part of plant. Some sewage sludge in many countries are suitable for use in agriculture while in other countries it's not recommended for use due to its high levels of heavy metal and its nature. However Kuwait sewage sludge can be used in agriculture according to Kuwait regulatory limit where the total concentrations of most heavy metals that is found in sludge and later in all part of plant, after analysis was within limits which ensured its suitability for that purpose.

Results obtained at the last analysis showed that the average concentration of the seven main heavy metals in different part of plant varies. For example in tomato plant the highest results of metal accumulation found in Mg in whole treatment, while the most heavy metal concentrate in fruit was Zn, where its detected in all repetition vice versa other.

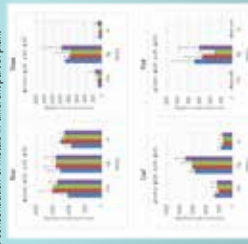
Introduction

Production of sludge from various sources is one of the major urban environmental challenges facing societies nowadays. Sludge is the byproduct of industrial and wastewater treatment process that is defined as unwanted but reusable by-product. According to USEPA, 1999, municipal sludge (Biosolids) a product of municipal wastewater treatment is rich in nutrients, organic and inorganic materials. Agricultural reuse of treated sludge is one of the most common sludge management practices. In EU, for example, 53% of the total produced sludge is recycled in agriculture directly or after composting (Kelessidis and Stasinakis, 2012). In USA and Canada, more than 50% and 40%, respectively, of the produced biosolids are applied to land (Venkatesan et al., 2015). Using sludge as fertilizer would return in several benefits to land, plant and yields.

So far, majority of the literature has focused on the environmental threats due to the existence of pathogens in sludge-amended soils (Smith, 2009; Pritchard et al., 2010). The main objective of the current study was to estimate the metal contents as potential environmental risks indicators from the disposal of sewage sludge containing in experimental soil mixed with varying amounts of sludge, selecting Tomato as a case study.

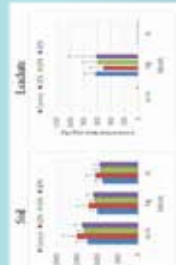
Results and Discussion

Fig.1 Average concentration of metals in different part of plant



Magnesium (Mg) was highest metal found in the whole plant parts and in all treatment (Fig. 1). Concentration of Mg detected higher in Leaf (17979 mg/Kg) and least in fruit (1689,18 mg/Kg). Fe is the second highest metal detected more in root in concentrations range between (10390.8 - 15267 mg/Kg). Al is the least metal detected in concentration between (9358.56 - 12532.33 mg/Kg) in plant root.

Fig.3 Average concentration of metals in soil and leachate



metals detected in great concentration in soil than leachate. Mg metal found in both soil and leachate and in the whole treatments. Its concentration is higher in soil (9962.83 - 12162.23 mg/Kg) and in leachate it was (612.17 - 627.67 mg/Kg). Fe in leachate was below detection limit and it appear just in 30% treatment in 6.09 mg/Kg. Al appear in very low concentrations in the leachate (0.2-4.3 mg/Kg) vice versa soil.

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The Effect of Lead on Vitamin D Metabolizing Enzymes; 1- α hydroxylase and 25-hydroxylase in Rats



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Abstract

Vitamin D deficiency and high blood lead (Pb) levels are both known to affect brain development and impair learning and memory. A negative association between blood levels of lead and vitamin D has been found, suggesting that lead interferes with vitamin D metabolism and function. We therefore, investigated whether lead would affect the expression of the two vitamin D metabolizing enzymes, 25 hydroxylase and 1 α -hydroxylase. Newborn Wistar rat pups were exposed to 0.2% lead acetate via their dams' drinking water from post-natal day (PND) 1 to 21 and directly in drinking water until PND 30. Expression of the two vitamin D metabolizing enzymes, 25-hydroxylase and 1 α -hydroxylase in several tissues (Liver, kidneys and brain) from both control and Pb-exposed groups were measured by Western blot. Pb exposure did not affect the level of brain 1 α -hydroxylase, whereas, it decreased the level of this enzyme in the kidney, only at PND21. The effect of Pb exposure on liver 25-hydroxylase was age dependent; it decreased at PND21 but significantly increased at PND30. Future plans are to perform immunohistochemical localization of the enzymes, estimation of serum vitamin D levels and lead analyses. Further research is needed to elucidate the biochemical mechanism(s) of these effects and their physiological relevance.

Introduction

Lead (Pb) is a toxic metal that is ubiquitously present in our environment and can affect almost all body systems. Increasing evidence indicates that lead exposure affects brain development and impairs learning and memory [1]. Similarly, one of the emerging roles of vitamin D that has been recognized in the recent years is its role in brain development and function [2]. Studies of children with high Pb exposure demonstrated a significant negative association between vitamin D level and blood Pb level. Children whose blood Pb levels were in the range of 33-55 μ g/dL showed a significant reduction in serum vitamin D levels. This reduction was even more pronounced in children with blood Pb concentration of > 62 μ g/dL, suggesting a dose-dependent effect of Pb on vitamin D status [3]. However the mechanism of this inverse association is not well understood. We therefore investigated the effect of Pb exposure on the vitamin D metabolizing enzymes in a rats model.

Methods

Lead exposure protocol: Wistar rat Pups were culled to 5 per litter at birth with both sexes in each litter and exposed to 0.2% lead acetate via their dams' drinking water from postnatal day (PND)1 to 21. The control group with similar number of pups was given regular water. Similar number was used at PND30 for both groups. Food and water was given ad libitum. Half of the animals were decapitated at PND 21 and others at PND 30; brains, livers and kidneys were dissected out, frozen on dry-ice, and stored at -80 °C till analyses.

Western Blotting: All tissues were homogenized in RIFA buffer, (50mM Tris, pH 7.4, 150 mM NaCl, 1% NP-40, 5 mM EDTA, 0.5% sodium deoxycholate, 0.1% SDS, 50 nM NaF), and protease inhibitor cocktail. Protein in each sample was determined by Bradford method and the homogenate kept at -80 °C till used. The expression levels of 25 Hydroxylase, 1 α -hydroxylase was determined by Western blot after resolving the lysate on 10% SDS-PAGE (NuPAGE 10%). β -Actin was used as a loading control. Blots were scanned and quantification of band density were measured by using Image J software

Statistical Analyses: Student t-test of two independent samples with unequal variances were used for comparing means. Significance level was set at $p < 0.05$.

Supported by KU Grant # YW01/14

Results

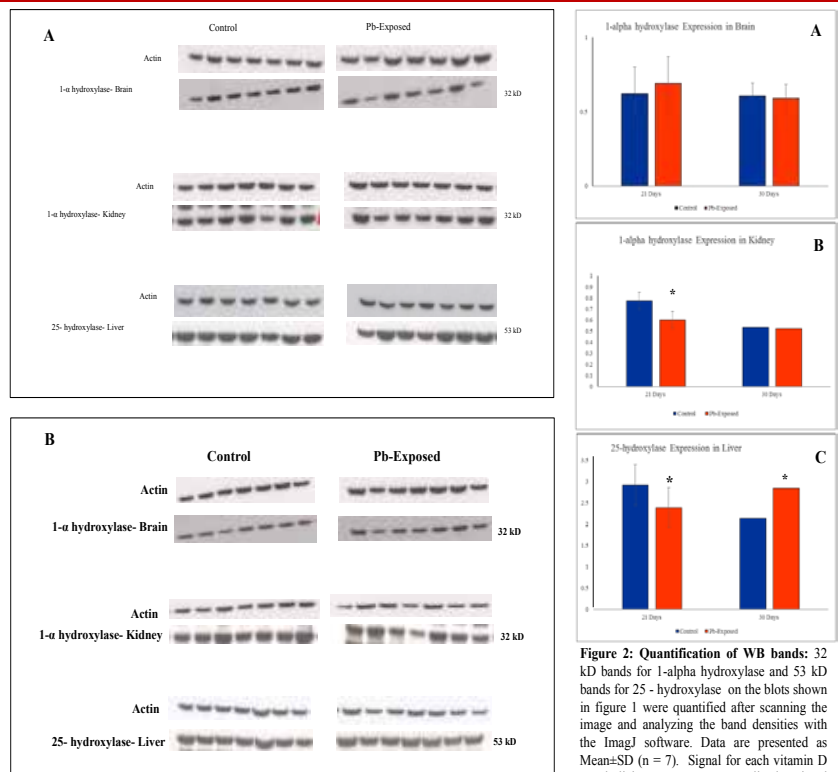


Figure 1: Western blot (WB) analysis of brain, kidney and liver tissues of control and Pb-exposed rats at PND 21 (A) and PND 30 (B): 20 μ g of brain, kidney and liver lysate was resolved on 10% SDS-PAGE, and immunoblotted with antibodies to 1- α hydroxylase (CYP27B1) in kidney and brain and 25-hydroxylase (CYP27A1) in liver. For loading control, the same membranes were stripped and re-probed with anti-actin antibody.

Figure 2: Quantification of WB bands: 32 kD bands for 1- α hydroxylase and 53 kD bands for 25-hydroxylase on the blots shown in figure 1 were quantified after scanning the image and analyzing the band densities with the ImageJ software. Data are presented as Mean \pm SD (n = 7). Signal for each vitamin D metabolizing enzyme was normalized to signal for β -actin (loading control). (A) 1- α hydroxylase expression in brain (B) 1- α hydroxylase expression in brain (C) 25-hydroxylase in liver. * significantly different from control ($P < 0.05$), using t-test for two independent samples.

Conclusions

- Western blot analysis revealed that at PND21 Pb exposure caused significant reduction (18%) in the level of liver 25-hydroxylase in the rat pups, whereas, at PND30, it caused a significant increase (30%) in this enzyme. The level of 1 α -hydroxylase was significantly decreased (22%) by Pb exposure at PND21, whereas at PND30, Pb exposure had no effect on this enzyme. On the other hand, the brain 1 α -hydroxylase level was not affected by Pb exposure either at PND21 or at PND30.
- These results suggest that the effect of Pb on vitamin D metabolizing enzymes is tissue specific and depends on the developmental stage of the rat pups.
- Future plans are to perform immunohistochemical localization of the enzymes, estimation of serum vitamin D levels and lead analyses.
- Further research is needed to elucidate the biochemical mechanism(s) of these effects and their physiological relevance.

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Blood glucose level and not the food form or glycemic index determines the subsequent eating behaviour in healthy individuals

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Abstract

Low glycemic index (GI) and solid form of foods are considered better than the high GI and liquid form. Nevertheless, conflicting results exist in the literature. This study elucidated the blood glucose contributing characteristics of various foods in liquid versus solid form in association with their satiety effects. Two experiments conducted employed young healthy females. Experiment 1 tested low versus high GI solid foods such as white wheat bread and canned chickpeas fed as 50g available carbohydrates. Experiment 2 measured low and high GI liquid and solid foods such as Coca-Cola, milk, and chickpeas fed in an equicaloric quantity. For the control treatment, water was used in both experiments. Blood glucose was measured by a portable glucometer, satiety by using a visual analogue scale and energy intake estimated from a pizza meal served at the end of the studies. The results suggested that blood glucose concentration before the meal and not the food form or its GI is an important determinant of satiety and energy intake at the subsequent meal and that the satiety power is longer by low GI foods compared to high GI foods.

Background

The epidemic prevalence of obesity and consequently type 2 diabetes demand evaluation of the factors associated with increased body weight gain. One among these factors is food type that influences the postprandial blood glucose concentration and stimulation of appetite. Although high GI foods raise blood glucose and enhance short-term satiety thus resulting in reduced food intake (1), the liquid form of foods is suggested less compensatory for the energy consumption at the next meal than the solid food form (2). Nevertheless, conflicting reports exist on the energy compensation or appetite suppression by liquid versus the solid form of foods (3-4). Therefore, the objective of this study was to explore the effect of form and GI of foods on blood glucose responses and consequently on appetite rating and energy compensation at the next meal.

Objectives

To explore the feeling of satiety and ingesting of calories in response to blood glucose concentrations when fed:

- Low GI versus high GI solid foods in equal amount of available carbohydrates
- Liquid versus solid form of low and high GI food in equal amounts of calories

Experimental Procedure

Subjects

- Two experiments were conducted in healthy females (age 18-24 years) from College of Life Sciences, KU
- Restrained eaters, breakfast skippers, any medication users were excluded

Treatments

Experiment 1: The three test preload treatments given in 50g of available carbohydrate and equal load were:

- Control: Water, 2. Canned chick, peas, 3. White wheat bread

Experiment 2: The four test preload treatments given in equicaloric amount and equal load were:

- Control: Water, 2. Coca-Cola, 3. 1% Milk, 4. Canned chickpeas

- A repeated measure design was used
- Baseline measures were taken after an overnight fast, followed by test food consumption
- Blood glucose and satiety were measured at 0,15, 30, 45, 60, 90 and 120min in Expt. 1 and only up to 60 min in Expt. 2
- Calories (Kcal) intake (ad-libitum pizza meal) was measured at 60 and 120min at the end of each Expt.
- Cumulative calories were calculated by adding the calories from the pizza meal and the preload test food
- %Energy compensation (EC) was calculated as:
 - *EC = Kcal after water control – Kcal after preload test food / Kcal of the preload test food X100
- Data was analysed by ANOVA with Tukey post hoc; results reported as Mean ± SEM with different letters denoting significant differences among treatments at p<0.05

Results

Fig.1: White bread (solid high GI) is higher at 30min and lower at 120min than Chickpeas (solid low GI) in blood glucose when fed as 50g available carbohydrates (* indicates a significant difference between bread and chickpeas. Both are different from water control at all points except 90 and 120min)

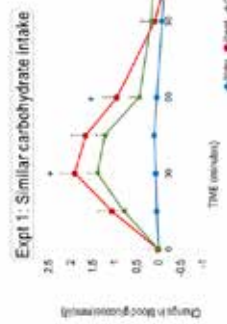


Fig.2: Coca-cola (liquid high GI) is higher than milk (liquid low GI) and Chickpeas (solid low GI) at 30min and 60min in blood glucose when fed in equicaloric amounts (* indicates a significant difference between Coca-Cola, milk and chickpeas and water)

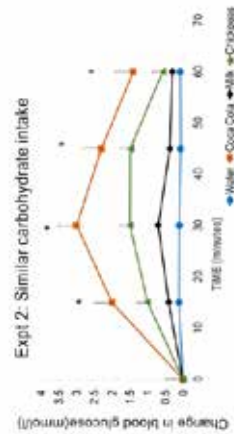
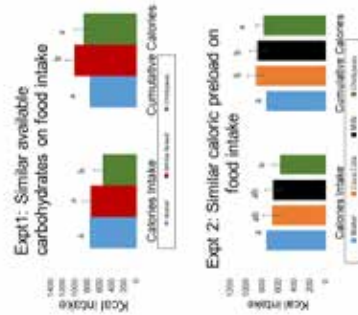


Fig. 3: Cumulative food intake at 120min (Expt. 1) was higher after White bread (solid high GI) and at 60min (Expt. 2) after Coca-Cola (liquid high GI) and Milk (liquid low GI) than after Chickpeas



Summary and Conclusion

These results demonstrate that

- % EC was the greatest (70% vs. -1%) after the chickpeas, a solid, low GI compared to bread, a solid, high GI food when fed at similar CHO content
- % EC was higher for chickpeas when compared with milk, a liquid, low GI (80% vs 40%) or Coca-Cola, a liquid, high GI food (80% vs 32%) when kcal were equated
- Both liquid and solid high GI foods Bread and Coca-Cola produced highest blood glucose peaks at 30min, which remained elevated at 60min but dropped below at 120min thus a negative association was found between blood glucose before meal, satiety and food intake
- We conclude that it is not just the food form, GI, macronutrient composition or the energy density, but rather the level of blood glucose impaired by the food that influence the feelings of hunger, and the amount of calories consumed at a subsequent meal.

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The Impact of Nutrition Education on the Dietary Habits of Food Science and Nutrition Students in Kuwait University

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Abstract: Nutrition information is important for everyone in order to get healthy lifestyle and free from any diseases. This study was attempted to determine the changes in knowledge, attitude and practices of food science and nutrition students after receiving a nutrition education in different levels. A validated questionnaire was used to assess attitude and practice at pre- and post-intervention. A total of 75 students from different studying years were involved in this study. Majority of the respondents (78.7%) improved their nutrition habits and 58.7% became more physically active. More than 86% of the students affected a relative or a friend in a positive way, showing the exceeding benefits of nutrition education.

Introduction

College students gain new experiences and personal freedom as well as develop a sense of identity. Unfortunately, during this phase, the tendency to engage in unhealthy dieting, meal skipping, fast food consumption and minimal physical activity is rather common.⁽¹⁾ Although behaviors of students are considered a temporary part of college life; however, unhealthy habits picked up at this stage can persist in adult life.⁽²⁾ These unhealthy habits are important risk factors for chronic diseases and linked to health-related quality of life, which is related to an individual's nutritional status.⁽³⁾ All of these associations suggest that it is important to establish good eating habits at an early age.⁽⁴⁾

While there are various modes of nutrition education interventions, however, this type of intervention is still rarely implemented for college students. This study thus intends to describe the impact of nutrition education interventions on the dietary habits and life style of Food Science and Nutrition majored college students. Food Science and Nutrition students represent the category of university students that can learn and derive the most benefit of a healthy lifestyle, by virtue of the nature of their studies.

Objective

To discuss the impact of nutrition education intervention for Food Science and Nutrition students, College of Life Science, Kuwait University. Our specific objectives were to examine the changes in nutrition knowledge, attitude and practice before and after intervention, and to determine the students' impacts on others.

Methodology

Subjects of this study were female students of Food and Nutrition Department at the College of life sciences, Kuwait University. Students varied from freshmen to seniors in their years of study. A total number of 75 students responded to a questionnaire that was designed for this study. The number of students included in this study was considered as a representative sample.

The questionnaire which was personally-distributed to food science and nutrition majored students, consisted of questions on demographics, personal nutrition, and exercising data. Carrying out this work was approved by the Department of Food Science and Nutrition. Data were analyzed using the Statistical Package for Social Studies (SPSS). Descriptive analyses were expressed in term of percentages. Pearson correlation coefficients were calculated to determine the relation between the independent and dependent variables. The level of significance for these tests was set at P< 0.05.

Results

A total of 75 students participated in this study, with an average age of 21.2 ±2.4 years. More than 37.0% of the students were in their second year of major study and the rest were in their first, third and fourth years – 25.3, 17.3 and 20.0%, respectively. The majority of the study subjects (81.3%) were single and (18.7%) were married. Students from Al -Asima and Hawaly Governorates represented 30.6 and 28.0% of subjects, respectively. Most of the participant's parents (36.7%) had college education level. The body mass index (BMI) values before and after intervention were calculated based on World Health Organization⁽⁵⁾ (Figure1). The majority of students (65.3%) had a normal BMI and the rest were underweight (9.3%), overweight (14.7%) and obese (10.7%). Most of the students joined the major as a first personal preference (93.3%). The nutritional habits and physical activity improvements are shown in Figure 2. Majority of the participants (86.7%) had positive effect on at least one of their friends or relatives. All of the respondents believed that having nutrition education is effective for having better life style, and the most effective studying courses according to their point of view are shown in Figure 3.

Marital status was a significant factor in improving the nutritional habit and being more physically active (P<0.05). Joining the department willingly was another significant factor for improving the nutritional habits and physical activity (P<0.05). Neither year of specializing nor parents education had a significant effect on having better life style.

Conclusion

Nutrition education is a significant factor that influences behaviors related to healthy life style. The present study showed the essential role of nutrition education on the students' lifestyles which exceeded the students themselves to others leading to improve their way of life. The global high obesity rates⁽⁶⁾ highlights the need to introduce nutrition education to promote healthy communities and healthy behaviors.

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Acknowledgment

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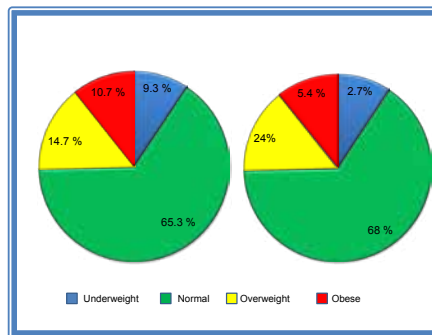


Figure (1) Body mass index categories before and after nutrition education intervention.

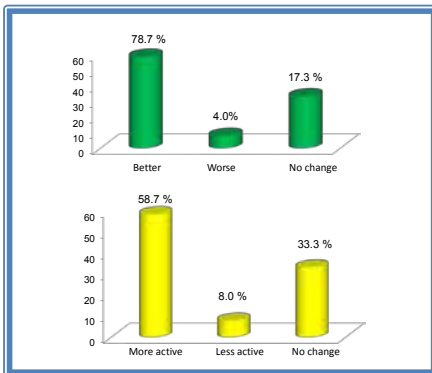


Figure (2) Nutrition habit (up) and physical activity (down) changes after nutrition education intervention.

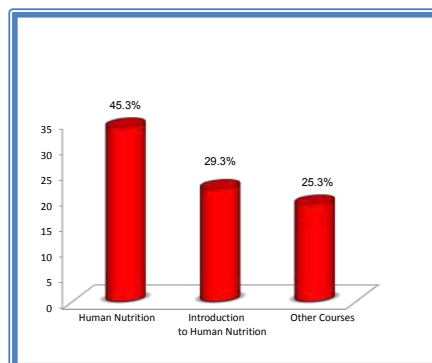


Figure (3) The most effective courses according to the students point of view.

The Effects of Developmental Vitamin D Deficiency on Spatial Learning and Memory In Wistar Rats



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Abstract

Vitamin D deficiency is widely prevalent throughout the world, and in particular in the Middle East. Recent research suggests that vitamin D is involved in brain development function. Maternal deficiency is associated with impaired cognitive function in adults but the consequences for the developing brain are less clear. The present study investigated the effect of developmental vitamin D deficiency (DVD) on cognitive function in children cannot be conducted for ethical reasons. We therefore, investigated the effect of DVD on learning and memory in Wistar rat pups exposed to vitamin D deficiency during gestation and lactation. Spatial learning and memory was measured by Morris water maze test. We found that DVD does not impair memory but impairs learning, particularly when the pups are deficient during lactation.

Introduction

Vitamin D deficiency is a major public health problem among infants, children, and adolescents in many parts of the world (1). Vitamin D deficiency is highly prevalent in Kuwait (2 and unpublished data). The effect of DVD on learning and memory has not been studied in human or in animal model. The very high prevalence of vitamin D deficiency in Kuwait together with the importance of vitamin D for brain development and function warrants such studies. However, such studies cannot be conducted in children for ethical reasons. The remarkably similar regional and cellular localization of the vitamin D receptor and the local activation of vitamin D by 1 α -hydroxylase in the brain of humans and rats (3) have provided a rationale for the present study. We therefore, conducted this study in the rat model, in which the effects of deficiency of vitamin D on learning and memory were previously investigated at postnatal day 24 (PND24; weaning).

Hypothesis & Objective

Hypothesis: Developmental vitamin D deficiency interferes with spatial learning and memory rat pups exposed to vitamin D deficiency during gestation and lactation.

Objective: To determine the effect of developmental vitamin D deficiency (DVD) on spatial learning and memory in Wistar rats.

Experimental Protocol

A total of 20 dams were bred for these experiments. At 6 weeks of age, half of the dams (n = 10) was put on a vitamin D deficient diet for 6 weeks in order to make them vitamin D deficient. The remaining dams (n = 10) served as control and were kept on the standard diet for the same period of time.

At 12 weeks of age all dams were mated with vitamin D normal male rats. Both groups of dams continued on their respective diets during pregnancy and lactation (6 weeks). At birth half of the pups born to the vitamin D deficient dams was randomly culled to vitamin D sufficient dams, while the remaining half was culled to vitamin deficient dams and vice versa. Thus the pups were divided into 4 groups as described in the table. At PND24 (weaning), all pups from each group were subjected to Morris water maze (MWM) test for learning and memory testing.

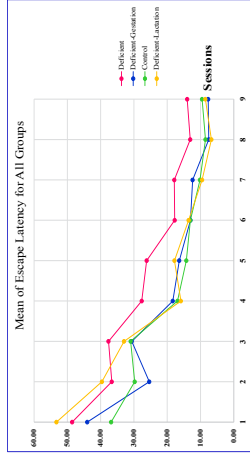
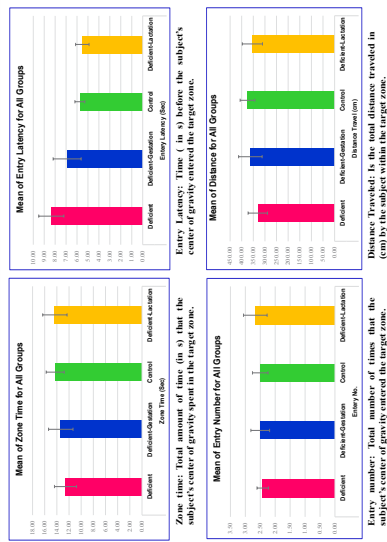
Dams (Vitamin D deficient)		Pups (Vitamin D deficient)		Pups (Vitamin D sufficient)	
Group #	Wash out (6 weeks)	Gestation (22 days)	Lactation (24 days)	Group #	Lactation (24 days)
Group 1	-	-	-	Deficient	-
Group 2	+	+	+	Control	+
				Deficient-Lactation	+
				Deficient-Gestation	-

Learning and spatial memory testing

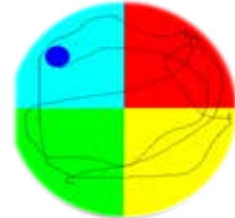
We used MWM to test the effect of DVD on spatial learning and memory. During the training sessions, rats were given 4 trials/session for a total of 9 sessions. Each trial had a cut-off time of 90 seconds and a trial interval of 30 seconds. The probe test was conducted 48 hours after the acquisition phase for short-term memory (STM) and repeated 10 days after probe test for long-term memory (LTM). The investigator of the learning and memory tests was blinded to the treatment groups. EZVideo™ Digital Video Tracking System (Accuscan Instruments, Inc. Columbus, OH, USA).

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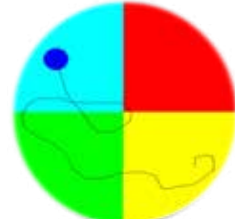
Results



Learning Session Deficient Group



Learning Session Control Group



Probe Test Deficient-Gestation Group



Probe Test Control Group



Discussion and Conclusion

Repeated measure ANOVA revealed that the deficient group learned significantly slower than control and the deficient-gestation group, and the deficient-lactation group learned as slow as the deficient group. These results indicate that DVD impairs learning and that vitamin D deficiency during lactation affects learning more than during gestation. The results also indicate that DVD impairs learning and memory more than during gestation. The probe test results revealed that there were no significant differences in various parameters of MWM test of memory either STM or LTM.

Conclusion:

DVD in rat pups slows down learning process but once learning has occurred, vitamin D deficiency has no significant effect on memory.

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Eating Disorders Attitudes and Body Dissatisfaction among College Students in Kuwait

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Abstract

The aims of the study was to assess the prevalence of eating disorders attitudes and body dissatisfaction among college students and to explore their relationship to gender, body mass index (BMI), and majors of study. This was a cross-sectional survey that involved 1126 participants. Data were collected using an anonymous, self-administered questionnaire. The questionnaire contained: 1) demographics, height and weight; 2) The Eating Attitude Test (EAT-26); 3) Figure Rating Scale (FRS). Our results indicated that for the overall sample, the prevalence of disordered eating attitudes was high (51%) among college students, and 77% of participants were dissatisfied with their current body weight. Our data showed a significant association between disordered eating attitudes and the degree of dissatisfaction, especially with dieting and food intake control behaviors ($P < 0.001$).

Introduction

Obesity rates are rising in Kuwait. Recent studies in the Arab countries showed that the view of ideal body shape has changed to a more Western value, in which thinness become the symbol of beauty (1). The self-evaluation of body mostly occurs during transition period from high school to university (1), and the cultural pressure on young adults to follow perceived ideal body shape affects equally men and women (2). College years are considered an important stage in which young adults make critical decisions about their health, appearance and social life, individually without adults' supervision (1,3). There is a lack of data about the prevalence of disordered eating attitudes and body dissatisfaction among college students in Kuwait.

Objectives

- 1) To assess the prevalence of eating disorders attitudes and body dissatisfaction among college students.
- 2) To identify the factors associated with disordered eating attitudes which includes gender, body mass index (BMI), and major field of study (Arts vs. Sciences).
- 3) To determine the associations of eating disorder attitudes and the EAT-26 subscales which identify dieting behaviors, bulimia and food preoccupation, and oral control with body dissatisfaction scale.

Research Methodology

A cross-sectional, descriptive study included 1126 student participants (498 male, 628 female) from public and private universities in Kuwait (Kuwait University, Gulf University of Science and Technology, and Australian College of Kuwait). Data collected was by an anonymous, self-administered questionnaire that contained sections on 1) demographics, height and weight; 2) The Eating Attitude Test (EAT-26); 3) Figure Rating Scale (FRS). Subscales calculated from EAT-26 included: Dieting*, Bulimia and Food preoccupation and Oral Control*. Data was analyzed using SPSS. Differences in means were assessed by Chi-Square and ANOVA with significance level at $p < 0.05$. Incomplete questionnaires and those filled by students below 18 years of age were excluded.

Results

Figure 1. Prevalence of disordered eating attitudes among all students

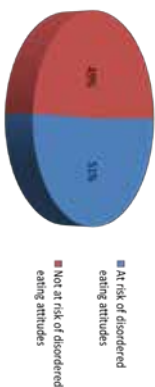


Figure 2. Prevalence of body image dissatisfaction among all students

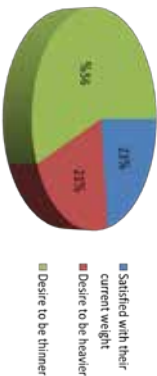


Table 1. Eating attitudes levels by gender, weight status, body image, and major field of study, independent variables

Independent Variables	EAT-26 Scores		P-value
	EAT(+), n (%)	EAT(-), n (%)	
Gender			0.132
Male	240 (42)	238 (46.5)	
Female	331 (69)	297 (53.5)	
BMI			<0.01
Underweight	29 (5.1)	51 (9.2)	
Normal	271 (47.5)	305 (55)	
Overweight	169 (29.6)	139 (25)	
Obese	102 (17.9)	60 (10.8)	
Body Image Dissatisfaction			<.001
Desire to be thinner	365 (63.9)	294 (47.6)	
Satisfied with current weight	129 (22.4)	136 (24.5)	
Desire to be heavier	78 (13.7)	155 (27.9)	
Study Major			0.076
Science related majors	319 (55.9)	339 (61.1)	
Art related majors	252 (44.1)	216 (38.9)	

Parsons, Chi-square tests were used to compare differences in the tendency of eating disorders across independent variables. Participants had score of EAT-26 above the cutoff score (20), which showed EAT (+), otherwise showed EAT (-).

Table 2. Mean \pm SEM values of EAT-26 and factor scores in the different degree of body image dissatisfaction groups.

	Desire to be thinner	Satisfied with current weight	Desire to be heavier	P-value
EAT-26 Total Scores	24.46 \pm 0.57 ^a	22.08 \pm 1.03 ^b	17.98 \pm 0.87 ^c	<.001
Dieting*	14.64 \pm 0.33 ^a	10.91 \pm 0.56 ^b	6.94 \pm 0.49 ^c	<.001
Bulimia & Food Preoccupation*	4.29 \pm 0.16 ^a	4.25 \pm 0.28 ^{ab}	3.57 \pm 0.27 ^b	.027
Oral control*	5.53 \pm 0.18 ^a	6.92 \pm 0.33 ^b	7.47 \pm 0.30 ^b	<.001

Differences in mean value were assessed with ANOVA test comparison procedure. Significant differences at P -value < 0.05 . Subscales calculated from EAT-26. A different superscript letters indicate statistically significant differences within a row.

Conclusions & Significance of Findings

- High prevalence of disordered eating attitudes was found among college students in both genders, and all major field of study.
- The majority of the participants (77%) were dissatisfied with their body image despite their current weight status.
- The results showed that the level of disordered eating attitudes increases with higher BMI, and with higher degree of body image dissatisfaction.
- These findings are alarming given that the rates of overweight and obesity are increasing in Kuwait, in all age categories.
- Our findings highlight the need for promotional activities involving nutritional education campaigns which should provide nutritional consultations on college campuses to address students weight concerns, eating attitudes, dieting practices, and body image issues.

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Science





PCR-based molecular discrimination between two heterophyid species (Digenea:Heterophyidae) isolated from Kuwait Bay

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Abstract

Trematodes of the family Heterophyidae are intestinal parasites of birds and mammals including human. Two different heterophyid species were known to parasitize the snail *Cerithidea cingulata* at Kuwait Bay. In this study, two PCR- based techniques were established for quick and accurate discrimination between the larval stages of the two heterophyid species. By employing Restriction Fragment Length Polymorphism (PCR-RFLP) and species-specific primers, the nucleotide differences in the published sequence of the second internal transcribed region (ITS2) of the ribosomal DNA (rDNA) in the two species have been used. For the PCR-RFLP technique, restriction enzyme *ApoI*, was selected and it generated different restriction profiles among the two heterophyids. In addition, species-specific primers were prepared for each heterophyid species that amplified distinctive fragments. These techniques provides a useful tool that can be used in future studies for the study of the distribution of heterophyid species and their definitive hosts at different localities of Kuwait Bay.

Introduction

Members of the family Heterophyidae Odhner, 1914 are intestinal trematodes of birds and mammals including human. More than 30 heterophyid species are known to infect humans worldwide (Chai and Lee, 2002; Elsheikha and Elshazly, 2008), and particularly in Asian countries (Chai and Lee, 2002; Thienkham *et al.*, 2012; Chai *et al.*, 2015). In Kuwait two different types of heterophyid cercariae, two parapleurolophocercous cercariae, were reported from the snails *Cerithidea cingulata* (Gastropoda: Prosobranchia) (Abdul-Salam and Sreelatha, 1998; Abdul-Salam *et al.*, 2000; Al-Kandari *et al.*, 2000, 2007). However, the molecular discrimination between the two heterophyid species was not established. In East Asia, *C. cingulata* has been involved in the transmission of two heterophyids of public health importance, *Heterophyes nocens* and *Pygidioopsis summa* (Seo *et al.*, 1981), the larval stages of different heterophyid species differ in their ITS rDNA. This expected difference can be used for accurate identification of different heterophyid species using their larval stages in Kuwait Bay. Once the sequence of ITS2 is known, restriction mapping of the ITS2 using restriction fragment length polymorphism (PCR-RFLP) can be used as a simple method for species assignment without the need of the more time consuming and costly DNA sequencing. Also it is possible to develop species-specific oligonucleotides as a quick and easy diagnostic tool for the identification of heterophyid species recovered from snails at Kuwait Bay.

Objectives

- Molecular discrimination between the larval stages of two heterophyid species using PCR-RFLP and PCR with species-specific primers.
- Develop molecular techniques that allow quick and accurate discrimination between the larval stages of different heterophyid species found in Kuwait.

Methods

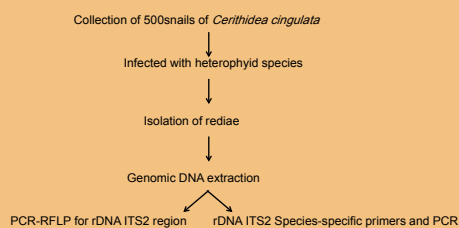


Fig. 1. The snail, *Cerithidea cingulata*



Fig. 2. The larval stage of Heterophyid I isolated from Kuwait Bay.



Fig. 3. The larval stage of Heterophyid II isolated from Kuwait Bay.

Table 1. The designed species-specific primers used for PCR which target unique sequences in the ITS2 region of the two heterophyid species.

Primer	Primer Sequence
H1F	5' TTATCCTGTGGCCACGTCGTG3'
H1R	5' TCTGAGCCGAGGTCAGGAAG 3'
H2F	5' CGAGGGTCGGCTTACAAACT 3'
H2R	5' GGTCAGGAAGCATAGGGCTC 3'

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Results

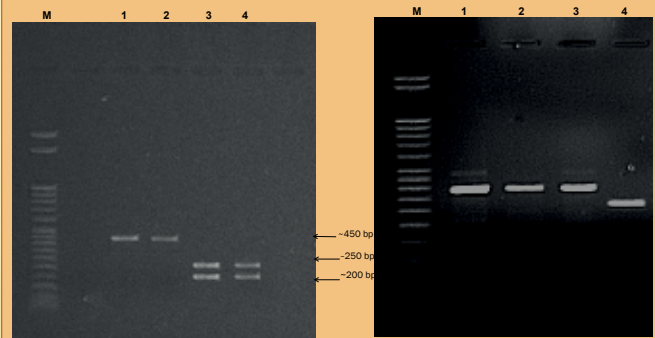


Fig. 4. RFLP patterns of ITS2 PCR products of Heterophyid I and Heterophyid II from Kuwait Bay after digestion with *ApoI* enzyme. The PCR- RFLP products were visualized on a 3.1 Nusieve; agarose gel stained with 10 µg/ml ethidium bromide. Lane M: 50 bp DNA marker; lane 1: PCR product of Heterophyid I with species specific designed H1 primer set; lane 2: PCR product of Heterophyid I after digestion with *ApoI*; lane 3: PCR product of Heterophyid II species; lane 4: PCR products of heterophyid II species after digestion with *ApoI*.

Fig. 5. The species specific primer amplified products were visualized on an agarose gel stained with 10 µg/ml ethidium bromide. Lane M: 50 bp DNA marker; lane 1: PCR product of Heterophyid I with species specific designed H1 primer set; lane 2: PCR product of Heterophyid I with trematode specific primers; lane 3: PCR product of Heterophyid II species with trematode specific primers; lane 4: PCR product of Heterophyid II species with species specific designed H2 primer set.

Discussion

The approach for the molecular discrimination of heterophyid species was twofold, either by PCR amplification of the complete ITS2 and its consequent RFLP analysis, or by PCR amplification of the selected ITS2 region with highly species-specific primers. The PCR-RFLP based approach has successfully differentiated between the larval stages of the two heterophyid species. The *ApoI* digested the ITS2 sequence of Heterophyid II and produced two easily visualized bands whereas the PCR products from Heterophyid I remained uncut. However, this method does not seem to be suitable for surveying snails infected with other digenean parasites such as *Cerithidea cingulata* because the primers used for the retrieval of the complete ITS2 region appears to anneal to highly conservative regions of 5.8S and 28S of most digenetic trematodes and as such, it amplifies the ITS2 region for all digenean parasites infecting the same snail host. This called for the more rigorous second approach proposed in this study that used PCR with species-specific primers. The designed primers do not show any similarity to the ITS2 sequence of the trematode species available in GenBank.

This is the first report of molecular discrimination between two heterophyid species in Kuwait using PCR-RFLP and PCR with species specific primers. Amplifying the ITS2 region with species-specific primers allows quick and reliable differentiation between the heterophyid species from Kuwait Bay where both heterophyids coexist, eliminating the need for sequencing.

Acknowledgments

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Survey of the algae of Al-Nowaiseeb coast south of Kuwait with emphasis on the epiphytic algae



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ABSTRACT

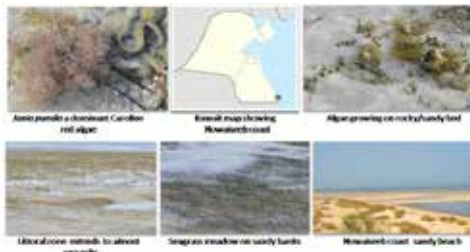
Twenty five years since the last survey on marine algal flora of the coast of Kuwait was carried out by Al-Hasan and Jones (1989). During this period various environmental incidents took place and in particular damage caused by the Gulf War 1990 and the drainage of the Mesopotamian marshes in south of Iraq affecting the sea water quality in coast of Kuwait. A revision on the marine algal flora of the littoral zone of Al-Nowaiseeb south of Kuwait, with special emphasis on the epiphytes is reported here. This has resulted in the recognition of new reports of algal species in this location.

OBJECTIVES

- To produce a revised check list of all major algae of Kuwait coastal areas: part 1: Al-Nowaiseeb coast.
- To establish an algal bank from the collected materials, also prepare Herbarium collections of the marine algae to be deposited in the KU- National Herbarium.

MATERIALS AND METHODS

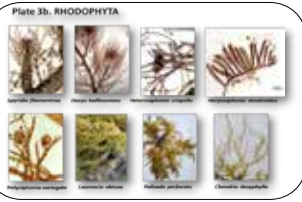
Nowaiseeb is located in the far south of Kuwait (28° 33' 05" N ; 48° 25' 51" E) characterized by being natural not yet impacted by human activities. Periodic sampling was carried during the lowest low tides every month during 2012- 2014. Samples were divided for preservation, herbarium and DNA analysis (for another study). Identification of algae was carried out using available literatures for the Gulf and Indian ocean (1,2,3,4,5,...) and kind help from Prof. Michael Wynne during his visit to our labs. Classification was carried according to Algae Base.



RESULTS

Table 1. List of algae collected from Al-Nowaiseeb littoral zone during 2012-2014

Phyla & Class	Genus	Species	Phyla & Class	Genus	Species
Chlorophyta			Rhodophyta		
Chlorophyceae			Stylonematophyceae		
<i>Blidingia</i>	<i>minima</i>		<i>Chroodactylon</i>	<i>ornatum</i>	
<i>Ulva</i>	<i>clathrata</i>		<i>Stylonema</i>	<i>alsidii</i>	
<i>Chaetomorpha</i>	<i>aerea</i>		Compsopogonophyceae		
<i>Chaetomorpha</i>	<i>Crassa</i>		<i>Erythrotrichia</i>	<i>carnea</i>	
<i>Chaetomorpha</i>	<i>linum</i>		<i>Sahlbingia</i>	<i>subintegra</i>	
<i>Rhizoclonium</i>	<i>riparium</i>		<i>Hydrolythum</i>	<i>farinosum</i>	
<i>Cladophora</i>	<i>caelothrix</i>		Bangiophyceae		
<i>Cladophora</i>	<i>nitellopsis</i>		<i>Bangia</i>	<i>atropurpurea</i>	
<i>Cladophora</i>	<i>herpestica</i>		Florideophyceae		
<i>Dictyosphaeria</i>	<i>cavernosa</i>		<i>Gelidium</i>	<i>crinale</i>	
<i>Bryopsis</i>	<i>hymenoides</i>		<i>Jania</i>	<i>pumila</i>	
<i>Caulerpa</i>	<i>sertularioides</i>		<i>Pneocyllum</i>	<i>fragile</i>	
<i>Avrainvillea</i>	<i>amadolepha</i>		<i>Peyssonella</i>	<i>simulans</i>	
<i>Acetabularia</i>	<i>colyculus</i>		<i>Hypnea</i>	<i>cornuta</i>	
			<i>Champia</i>	<i>indica</i>	
			<i>Centroceras</i>	<i>clavulatum</i>	
			<i>Ceramium</i>	<i>luetzelburgii</i>	
			<i>Anothischium</i>	<i>tenuis</i>	
			<i>Spyridia</i>	<i>filamentosa</i>	
			<i>Dasya</i>	<i>baillouviana</i>	
			<i>Heterosiphonia</i>	<i>crispella</i>	
			<i>Acetabularia</i>	<i>muscosides</i>	
			<i>Heterosiphonia</i>	<i>dentatoides</i>	
			<i>Chondria</i>	<i>dasyphylla</i>	
			<i>Digenea</i>	<i>simplex</i>	
			<i>Laurencia</i>	<i>obtusata</i>	
			<i>Palisada</i>	<i>perforata</i>	
			<i>Polysiphonia</i>	<i>coacta</i>	
			<i>Polysiphonia</i>	<i>denudata</i>	
			Cyanophyceae		
			<i>Lyngbya</i>	<i>oestuarii</i>	
			<i>Microcoleus</i>	<i>chthonoplastes</i>	
			<i>Oscillatoria</i>	<i>princeps</i>	
			<i>Phormidium</i>	<i>corium</i>	
			<i>Calothrix</i>	<i>scopulorum</i>	



CONCLUSIONS

The littoral zones in Nowaiseeb is shallow and extend down to the subtidal zone approximately 1.2 km. Mostly sandy with scattered calcareous stones upon which the algae grows throughout the year. Mostly dominated by the rhodophyta and fewer phaeophyta and even less chlorophyta. Highest diversity was found during spring and autumn. Phaeophyta are generally richer in the subtidal zone. The algal flora of Nowaiseeb showed remarkable differences from that of the northern coastal line of Kuwait (not reported). Since the northern coasts are dominated by species of the cyanophyta, chlorophyta, phaeophyta and fewer rhodophyta. The most dominant species in Nowaiseeb littoral zone were *Laurencia optusa*, *Palisada perforata*, *Chondria dasyphylla*, *Spyridia filamentosa*, *Jania pumila* and *Digenea simplex*, whereas the subtidal zone was dominated by the brown algal species of *Sargassum*, *Sargassum decurrens* (*Sargassopsis decurrens*), *Hormophysa triquetra* (*H. cuneiformis*), *Sirophsalis trinodis*, *Colpomenia sinuosa*, *Dictyota implexa*, *Nemacystus decipiens* and *Sphacelaria rigidula*. Epiphytic and epilithic algae were not well explored in the Kuwaiti coastal area and particularly from this area, hence, required thorough investigation. However, this study will continue to add more information to this subject.

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Conformational Switch of the Cytoplasmic Domain of hRAGE Upon Self-Association Using Fluorescence Spectroscopy.

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Abstract

The Human Receptor for Advanced Glycation End-product, also known as hRAGE, is a transmembrane protein receptor. This receptor belongs to a special group of proteins known as Intrinsically Disordered Proteins. The disorder allow these proteins to take different conformations in solution. In hRAGE, the cytoplasmic domain is disordered which makes it hard to characterize and study. The best study approach for this domain is by using dynamic techniques in solution such as Fluorescence spectroscopy techniques. Fluorescence allows for the non-invasive detection of the changes in the folding state, compact structure vs. extended, of hRAGE. Thus, shedding light on the conformational switch of hRAGE, which is the first step in reaching a complete 3D structure of this domain.

Introduction

Many proteins are structured molecules with a well-defined three dimensional (3D) structure needed for their function: the structure-function paradigm. However, some proteins or protein regions are extremely flexible and lack a 3D structure. These are known as intrinsically disordered proteins (IDPs) and intrinsically disordered regions (IDRs), respectively. These proteins are functional and take up a group of conformations in solutions, and hence expand the traditional structure-function concept of proteins. One of these proteins is hRAGE. The human receptor for advanced glycation end product (hRAGE) is a transmembrane IDR receptor (Figure 1). Its name is derived from its binding to one class of ligands: the advanced glycation end products (AGEs). The IDR, the cytoplasmic domain, is responsible for signal transduction and it is known to self-associate. IDRs can be identified by their primary sequence (Figure 2), which contains several charged amino acids. The self-association can be studied using fluorescence spectroscopy techniques. In fluorescence, the microenvironment of the amino acid Tryptophan can be studied, and any changes in that environment will be reflected in changes of the emission spectra. Tryptophan emission is from 310 nm, hydrophobic microenvironment, to 360nm, a hydrophilic microenvironment. The cytoplasmic domain of hRAGE has a single tryptophan, hence changes in the fluorescence emission spectra, both intensity and wavelength, can be linked to changes in this tryptophan. Moreover, it can be linked to the changes in 3D structure of this dynamic domain. In the end, understanding hRAGE's structure is vital since it is linked to several diseases including diabetes and Alzheimer's disease.

Objective

The use of fluorescence steady state spectroscopy to assess the structural changes of the cytoplasmic domain of hRAGE, by monitoring the changes in the microenvironment of tryptophan. The changes are also linked to the folding state of this domain as well as its self-association/aggregation state.

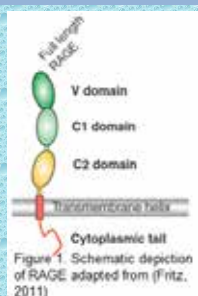


Figure 1. Schematic depiction of hRAGE adapted from (Fritz, 2011)

Research methodology

A protein purification protocol is used to purify hRAGE (which usually takes 2 weeks). Once the pure protein is obtained a concentration series is done using Amicon concentrator. Moreover, both UV/Vis spectrophotometer and Fluorometer (FluoroMax-4) are used to monitor concentration, and structure changes, respectively.

Results

In Figure 3, an overlay of a blank subtracted cytoplasmic hRAGE sample is presented. The sample was gradually concentrated from 12.1uM to 846.4uM. The solvent's, sodium phosphate buffer, emission spectra was subtracted from all data before overlay. next, in Figure 4 each point is divided by its maximum emission and then all the points are presented together as a normalized graph. At 12uM (black) the sample starts at 309 nm then an additional specie appears at 355nm starting from 23uM (red) point. At the 170.2 uM point (cyan) almost equal population of both species exist, but by the 338.1 uM point the higher wavelength specie dominates the spectra.

Discussion

Referring to both Figure 3 & 4 and to Table 1, it is clear that as the concentration of cytoplasmic hRAGE increases the sample is shifting towards higher wavelengths. The shift confirms that the cytoplasmic domain of hRAGE is dynamic in solution, and that it takes up several conformations. The shift indicates the changes in the tryptophan's environment towards a hydrophilic environment upon an increase in protein concentration. However, as seen in Figure 2 this domain has only 4 hydrophobic amino acids which doesn't explain the hydrophobic environment of tryptophan noticed at 309nm. This means that the tryptophan experiences a hydrophobic environment due to structural changes (self-association) that shields the tryptophan away from solvent at lower concentrations, yet allows the interaction with solvent at higher concentrations.

Conclusion

The cytoplasmic domain of hRAGE self-associates as indicated by the noticed environmental shifts in the fluorescence spectra.

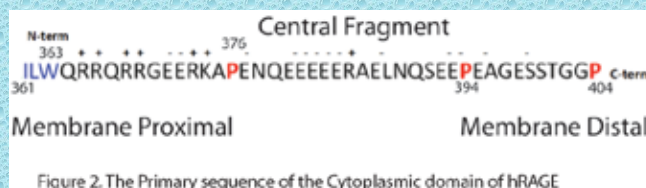


Figure 2. The Primary sequence of the Cytoplasmic domain of hRAGE

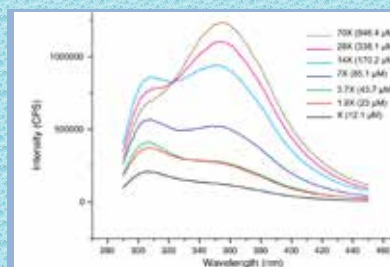


Figure 3. The gradual Concentration of Cytoplasmic hRAGE sample. (Blank subtracted)

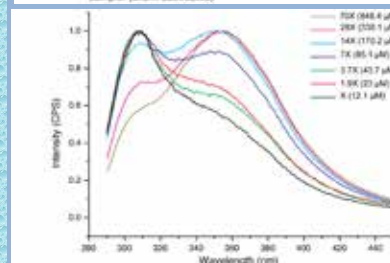


Figure 4. The gradual Concentration of Cytoplasmic hRAGE sample. (Normalized)

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Table 1. Spectrophotometer results of hRAGE serial concentration		
Concentration uM	UV 280	Fluorescence
12.1	0.081	309nm
23	0.127	309 nm & 355 nm
43.7	0.191	309 nm & 352 nm
85.1	0.303	308 nm & 352 nm
170.2	0.496	309 nm & 351 nm
338.1	0.868	309 nm & 352 nm
846.4	N/A	308nm & 355nm

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Potential phytoremediation of a hypersaline area via rhizospheric and phyllospheric microorganisms of a local halophilic, wild plant

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Abstract

The rhizosphere and phyllosphere of the halophyte *Halocnemum strobilaceum* naturally inhabiting hypersaline coastal areas of the Arabian Gulf harbor up to $8.1 \times 10^4 \text{ g}^{-1}$ and $3 \times 10^2 \text{ g}^{-1}$, respectively, of extremely halophilic oil-utilizing microorganisms. The total rhizospheric and phyllospheric microbial communities could attenuate crude oil in a nitrogen-containing medium, but also equally well in a nitrogen-free medium.

Introduction

There are hypersaline areas in Kuwait with NaCl concentration up to $>4 \text{ M}$ (Fig. 1). Those areas support one halophilic plant, *Halocnemum strobilaceum* (Chenopodiaceae), a richly branching under-shrub (Fig. 2). We analyzed the halophilic, hydrocarbonoclastic microflora associated with roots and shoots of this plant and investigated their potential as phytoremediation tools for soil and air hydrocarbon pollutants (1, 2)



Fig. 1. Map of Kuwait showing the location of Al-Sabkhahs (northern and southern).



Fig. 2. A whole *Halocnemum strobilaceum* plant.

Objectives

To study halophyte plant samples collected from the northern and southern sabkha of Kuwait.
To investigate the hydrocarbonoclastic potential of predominant constituent bacteria and archaea associated with the hypersaline plants.

Methods

The conventional dilution plate method was used to count and isolate halophilic root- and shoot-associated microorganisms using a mineral medium with oil vapor as a sole source of carbon and energy. The microorganisms were characterized by comparing their 16S rRNA gene sequences with those in the GenBank database. The crude oil consumption was measured in terms of total peak area reduction of GLC-profiles of residual oil recovered from cultures as compared with the total peak areas of the abiotic controls.

Results and Discussion

The histograms in Fig.3 show that the rhizospheres and phyllospheres of the studied plant (*Halocnemum strobilaceum*) harbored up to $8.1 \times 10^4 \text{ g}^{-1}$ and $3 \times 10^2 \text{ g}^{-1}$, respectively of halophilic microorganisms cultivated at up to 4 M NaCl. Considerable numbers of such microorganisms also grew on a nitrogen free medium, meaning that they could be diazotrophic, i.e. self-independent in their nitrogen nutrition. The 16S rDNA sequencing of the isolates revealed that they consisted of a mixture of extremely halophilic bacteria and haloarchaea.

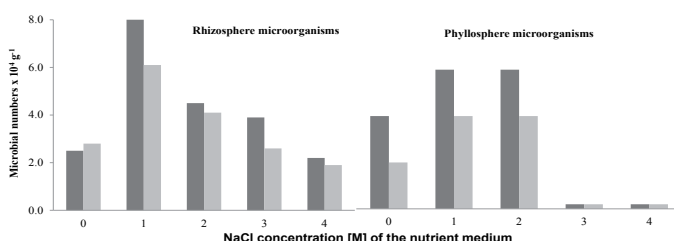


Fig. 3. Total numbers of cultivable oil-utilizing microorganisms in the rhizosphere and phyllosphere of the halophyte *Halocnemum strobilaceum*. Thick shaded columns, NaNO_3 containing medium; light shaded columns, NaNO_3 free medium.

The results in Table 1 indicate that the predominant microorganisms in the rhizosphere were haloarchaea belonging to the genera *Halobacterium* and *Halococcus*. Halophilic bacteria were also present.

The results also show that the phyllospheric microflora comprised the dimorphic yeast *Candida utilis* in addition to two bacterial species.

Table 1. Halophilic, hydrocarbonoclastic microorganisms associated with *Halocnemum strobilaceum*.

Organisms	Subdivision	% of the total
Rhizospheric microorganisms		
<i>Halobacterium</i> sp.	Halobacteria	1.2±27
<i>Brevibacillus borstenlensis</i>	Firmicutes	1.1±23
<i>Pseudoalteromonas ruthensis</i>	Proteobacteria	0.9±19
<i>Halomonas sinaensis</i>	Proteobacteria	0.5±11
<i>Halococcus</i> sp.	Halobacteria	0.4±8
<i>Pseudomonas stutzeri</i>	Proteobacteria	0.3±6
<i>Mycobacterium bolletii</i>	Actinobacteria	0.2±4
<i>Paenibacillus polymyxa</i>	Firmicutes	0.1±2
Phyllosphere microorganisms		
<i>Candida utilis</i>	Eucaryote	1.7±35
<i>Ochrobactrum</i> sp.	Proteobacteria	1.2±34
<i>Desulfovibrio</i> sp.	Proteobacteria	1.4±31

The histograms in Fig. 4 show that the total rhizospheric and phyllospheric microflora on 1 g root and shoot samples (used as inocula) consumed hydrocarbons at various salinities, up to 4 M NaCl. Oil consumption also occurred in nitrogen free media.

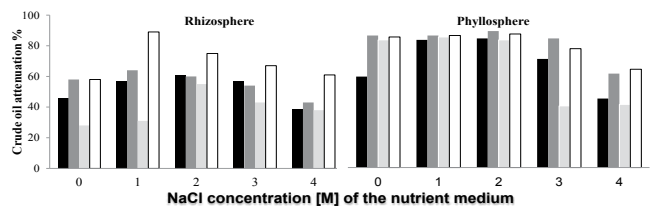


Fig. 4. Crude oil-attenuation by total rhizospheric and total phyllospheric microflora at different levels of medium salinity.

Black columns, NaNO_3 containing medium, incubated in 1 week; thick shaded columns, NaNO_3 containing medium incubated in 2 weeks; light shaded columns, NaNO_3 free medium incubated in 1 week; white columns, NaNO_3 free medium incubated in 2 weeks.

The GLC profiles in Fig. 5 demonstrate that the microflora associated with 2 g shoot samples consumed volatile hydrocarbons in closed microcosms. This is a clear cut evidence for the role of shoot associated microorganisms in volatile hydrocarbon removal.

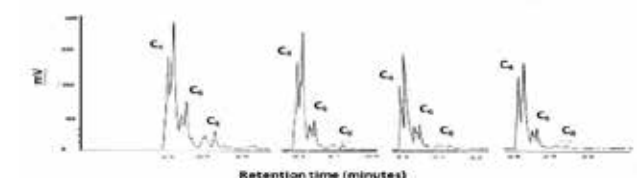


Fig. 5. Typical GLC profiles of crude oil vapor in closed atmosphere around 2 g fresh aerial plant organs.

Profiles from left to right: samples taken at time zero and after 3, 6 and 9 days.

Conclusion

Halophilic microorganisms associated with roots and shoots of the studied halophilic plant are effective tools in hydrocarbon bioremediation for hypersaline environments.

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Acknowledgement

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Antibacterial Activity Of The Synthesized Gold NanoParticles (GNP's)

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Abstract

The aim of this study is to use nanogold particles against pathogenic bacteria that cause disease to human, animals, and plants which will lead to some of environmental problems. Therefore, starts by introducing the concept of nanotechnology. The second part examines the bacteria, which include gram positive and gram negative bacteria. Thirdly, discusses nanogold particles and its applications. Finally, there is a discussion on the nanotechnology and the environment.

Introduction

Resistance to antimicrobial is a serious health threat and environmental issues. This is complicated further by the increase rate of infection from resistant microbial organisms, which have become resistant to multiple drugs. The reduced effectiveness of antibiotics has undermined the ability of drugs to treat infectious diseases, as well as manage complications common among vulnerable patients who undergo organ transplant, surgery, dialysis and chemotherapy. As a result, this has triggered more inventions with the purpose of finding a solution for increasing resistance to antimicrobial drugs. Among these discoveries is nanotechnology which has dominated the health sector for offering a solution to drug resistance. In this case, nanogold particles are a novel discovery that is being used to treat pathogenic bacteria. However, there is inadequate information about the application of nanogold particles in treating pathogenic bacteria. Therefore, the aim of this study is to use nanogold particles against pathogenic bacteria that cause disease to human, animals, and plants which will lead to some of environmental problems.



Figure 1: (a) *S. epidermidis* (b) *S. aureus* (c) *Proteus* (d) *Acinetobacter sp.*

Research Aim

The aim of this research is to use nanogold particles against pathogenic bacteria that cause disease to human, animals, and plants which will lead to some of environmental problems.

Methodology

- Nutrient agar plates were prepared for testing antibacterial activities.
- The plates were divided into 3 parts.
- A loop full of 4 different strains of bacteria was added to 3-4 ml of distilled water.
- 1ml of bacterial suspension for each bacterium was spread on nutrient agar plates by using sterile spreader or sterile cotton swab.
- The plates were kept for drying for 3-5 min.
- 20 µl of different concentration of nanogold particles at 0.25, 0.5, 1, 2, 3, 4 and 5mM were dropped on nutrient agar plates with bacterial suspension of 4 different strains.
- Ampicillin (25µg/l) is an antibacterial agent was used as positive control.
- HAUCL4 solution was used as negative control.
- The plates were kept for drying 3-5 min.
- All plates were incubated at 37o for 24 hours.
- Plates were observed antimicrobial activities by determining the diameters of inhibition zones for each strain.
- For accurate analysis, tests were run in triplicates for each isolate to avoid errors.

Results

GNPs (nm)	Diameter of inhibition zone(mm)											
	<i>Staphylococcus epidermidis</i>		<i>Staphylococcus aureus</i>		<i>Proteus</i>		<i>Acinetobacter sp</i>					
	seKD	control	seKD	control	seKD	control	seKD	control	control			
0.25	-	5	-	7	-	-	-	7	-			
0.5	-	8	-	8	-	-	-	8	-			
1	-	6	-	6	-	-	-	7	-			
2	1	7	-	6	-	-	-	6	-			
3	3	6	-	5	-	-	-	8	-			
4	5	5	4	5	-	-	5	5	-			
5	9	6	20	8	10	-	10	15	-			

Table 1: Inhibition zone in mm of pathogenic bacteria.

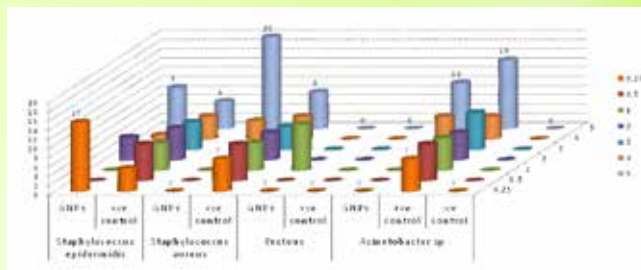


Figure 2: Histogram of inhibition zone of pathogenic bacteria.

Discussion

The diameters of inhibition zone of *Staphylococcus epidermidis* were 1 mm at 2 nm of GNP's, 3 mm at 3 nm of GNP's, 5 mm at 4 nm of GNP's and 9 mm at 5 nm of GNP's. As shown in the table of result, the positive control was more effective at tested bacteria. But the 5nm of GNP's was more effective than positive control, which was 6 mm. The diameters of inhibition zone of *Staphylococcus aureus* were 4 mm at 4 nm of GNP's and 20 mm at 5 nm of GNP's. The 5 nm of GNP's was much more effective than positive control which was 8 mm as shown in the result table.

As shown in the table, the diameter of inhibition zone of *Proteus* was 10 mm at 5 nm of GNP's. There was no inhibition zone for the positive control. This means that *Proteus* is resistance to positive control. The diameter of inhibition zone of *Acinetobacter sp.* were 5 mm at 4 nm of GNP's and 10 mm at 5 nm GNP's, while positive control was more effective than GNP's on *Acinetobacter sp.* due to the result table.

As shown in the table, there were no inhibitions zones for all tested bacteria by negative control, which mean these bacteria, are resistance to negative control. Due to these results, as a conclusion that GNP's is more effective on Gram positive bacteria rather than Gram negative bacteria.

Conclusion

Nanotechnology has evolved to provide solutions to various health issues. One of these issues is the management of multidrug resistant bacteria by the use of nanoparticles. Nevertheless, pathogenic bacteria, which include gram positive and gram negative, still pose a great threat to the global population. Therefore, nanogold particle is a new invention whose popularity has risen as a solution to bacterial infections. Despite the significance of GNP's, their application still poses a threat to the environment.

Antibiotic resistance has become a significant challenge to the health system at local, regional and global levels. For example, Gram-negative Multi-drug resistant bacteria have become of special concern for their health threat. As a result, new categories of small molecules antibiotics for the gram negative bacteria have also increased in the recent years. Nevertheless, the number of cases of antibiotic resistant bacteria is increasing at an alarming rate. For example, Kuwait alone recorded an increase of 5 percent of cases of resistance to antibiotics in 2014, and the contagions of the related diseases cause more than 5,000 deaths annually. In United States, more than 2 million cases of infections are recorded each year with over 23 thousand deaths. Therefore, there has been an increasing need to develop a new strategy to combat this problem, which resulted in the inventions of nanoparticles.

Acknowledgments

I am thankful to "Allah" for giving me the strength and ability to successfully complete my Master program. And I express my deepest appreciation to my advisor Dr. Majdy Montasser for his guidance, patience and foresightedness. This project paper would have not been completed without his support. And especially thanks to Ashraf Younes, his guidance was so helpful in technical and his assistance with the entirety of this project. Again this project paper would have not been completed without his support. Lastly, but not the least, I thank my parents, family, friends and all those who have helped, in one way or another and supporting me to complete this research work.

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Isolation and characterization of plant promoting growth halophilic bacteria from the rhizosphere of *Tamarix aucheriana* in Kuwaiti salt marshes

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ABSTRACT

About 10% of Kuwait's total land area is covered by 'Sabkha' or salt marshes. 14 different halophilic bacterial strains isolated from the rhizosphere of *Tamarix aucheriana*, a common plant that grows in the sabkha region, were identified, characterized and tested for their plant growth promoting activities. The bacteria were identified and characterized using both biochemical tests and molecular biological tests. The plant growth promoting properties of the isolated strains were determined by the bacterial ability to a) produce indole acetic acid b) solubilize phosphate compounds, c) antibiotic sensitivity and d) fix nitrogen. The results indicated that all bacterial isolates were able to produce indole acetic acid in the presence of L-Tryptophan. On the other hand, none of them could solubilize mineral phosphate. Of the 14 strains isolated, 10 of them were able to fix nitrogen. The evolutionary relationship of the isolated bacteria was also investigated based on the analyses of their 16S rRNA sequences. The 16S rRNA analysis of the isolated bacteria classified the isolated species into of five major bacterial genera: *Bacillus*, *Halobacillus*, *Halomonas*, *Nesterenkonia*, and *Piscibacillus* with differing sub-branches indicating the divergent species within the same genera.

INTRODUCTION

The ability of the Halophilic bacteria to tolerate high soil salinity make them ideal agents for reclamation of saline soil (Von Sengbusch, 2003). Plant growth promoting rhizobacteria (PGPR) enhance the plant growth and have the ability to colonize the plants roots (Lugtenberg & Kamilova, 2009). Isolating a halophilic bacteria that is also a PGPR might be the key to develop the marshy wastelands of Kuwait into successful agricultural regions. In this study we aim at, the isolation of halotolerant/halophilic bacteria from the rhizosphere of *Tamarix aucheriana*, a halophytic plant which is frequently associated with salt marshes or 'sabkhas' in Kuwaiti desert, the examination of their ability as plant growth promoting rhizobacteria (PGPR) which enhances the growth of halophytic plant in saline soil, and also their characterization using biochemical tests and molecular approaches using 16s rRNA sequence analysis.

MATERIALS & METHODS

- Collection of soil samples from the rhizosphere of *Tamarix aucheriana* (Siddikiee, *et al.* 2010).
- Serial dilution of the soil samples
- Spread plating
- Isolation of individual colonies (Siddikiee *et al.* 2010)
- Pure culture in plates and slants
- Study of colony morphology
- Biochemical identification of bacterial strains using gram staining and API (Kumar *et al.*, 2012) and Antibiotic sensitivity tests
- Molecular characterization of bacterial strains: PCR and Sequencing (16S rRNA gene sequencing; Applied Biosystems Kit)
- Screening for PGPRs: Phosphate solubilization, IAA and nitrogen fixation (Yasmin *et al.* (2009); Kumar *et al.* (2012))
- Construction of phylogenetic tree (PAUP)
- In green house the tomato plant were inoculated at the rhizosphere with some of the isolated strains that were screened and proved to be PGPR



Fig 1. *Tamarix aucheriana*, a halophytic plant growing in salt marshes or 'sabkhas' in Kuwaiti desert



Fig 2. The difference between the tomato plants that were treated with the isolated PGPR strains and the un-treated plants

RESULTS

Table 1. Biochemical reactions of the isolated bacteria from soil samples

Table with 14 columns: Lab Designated name, Genus, and various biochemical tests (DNase, Amyl, Urease, etc.).

Table 2. Molecular characterization of the isolated bacteria from soil samples

Table with 6 columns: Lab Designated name, Genus, Subdivision, Nearest GenBank Match, Similarity (%), Base Comparison.

Table 3. Antibiotic sensitivity tests of the isolated bacteria from soil samples

Table with 5 columns: Lab designated name, Bacteria, and Antibiotics (C30, K, P30, S, O).



Fig 3. DNA bands of bacteria after PCR

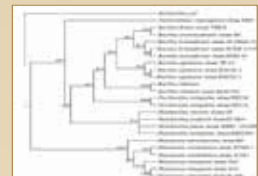


Fig 4. Cladogram representing bacterial diversity

Table 4. Screening test for PGPRs

Table with 5 columns: Lab designated name, Bacteria, IAA, +L-TRP, +P solubilization, +Nitrogen fixation.

CONCLUSION

The isolated bacterial are categorized into of five major bacterial genera: *Bacillus*, *Halobacillus*, *Halomonas*, *Nesterenkonia*, and *Piscibacillus* with differing sub-branches. Out of the 14 strains isolated, 10 of them might be potential PGPRs. This has been further examined by green house study which showed the PGPR's strains found in the Kuwaiti Sabkhas' was shown to induce the growth of in tomato plants. The salinity in the Kuwait Sabkhas' adversely affects plant growth and development (Shukla *et al.* 2012). This study shows that the halotolerant plant-growth-promoting rhizo-bacteria (PGPR) found in the Kuwaiti environment can help plants to maintain better growth by reducing salt stress.

ACKNOWLEDGMENT: The work was supported by College of higher education at Kuwait University for providing a grant for this study.

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Discovering a natural, available and abundant source of red color for “Sadu House” to dye camel wool and cotton fibers permanently

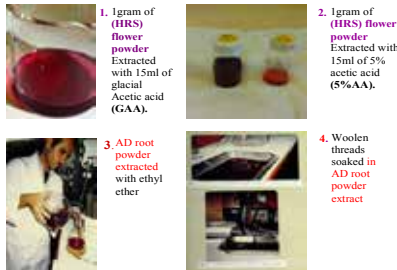
Lamya Hayat : Kuwait university , Faculty of Sc. Biological Sc. Dept. Kuwait
Lamya14@hotmail.com

Abstract:

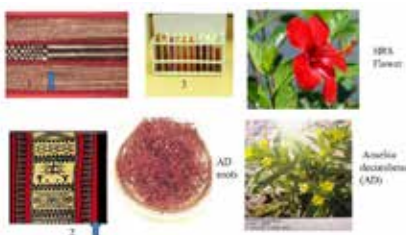
Sadu House of Kuwait is a society that protects the interests of the Bedouins and their ethnic handicrafts. Their handicrafts include tents , rugs , bags made from camel wool. It wanted to keep the tradition of tent and rug weaving natural in all the steps. That is to replace the present synthetic dyes with natural ones. The target of this work is to extract pigments from local plants to give a fixed color with camel wool. Before 1990 a deep red pigment was extracted from *Arnebia decumbens* roots , a periodical plant , it dyed the camel wool in deep red color without using mordant. After 1990, the red flower of *Hibiscus rosa sinensis* (HRS) was used instead. The 5% acetic acid (vinegar) extract of (HRS) red flower had good yield and deep red color, relatively it was the solvent of choice as it has no harmful effects on the environment and the workers health. Using different mordants like alum and some metal chlorides manifested in a wide range of fixed colors varying from beige, rust, brown, green, pink, dark red / purple to lilac which intensified with heat .

Objectives

- This poster focuses on researching and experimenting on modern recipes to rediscover traditional methods of dyeing.
 - The Bedouin traditional mordant was camel urine. In this work the mordant used were the different salts of most abundant minerals detected in camels urine.
 - The pH of camel's urine is basic . The color extracted from *Hibiscus Rosa Sinensis* (HRS) with vinegar, and *Arnebia decumens* (AD) with ethanol are acidic . The complex (minerals salts – extracted color) pH , is adjusted to produce the color of interest. Picture 3 under topic [Rugs and parts of tents dyed with natural pigments]shows the colors obtained with (HRS)No.(1) and with (AD) No.2.
 - The color produced should prove that it neither wash out with most potent detergent nor fade away on exposure to sun light
- Color comparison : cold extraction of (HRS) flower powder with glacial acetic acid (1) and vinegar (5% acetic acid) (2) / hot extraction of AD root powder with ethyl ether.**



Rugs and parts of tents dyed with natural plant pigments



Introduction

There are more than 230 kinds of Hibiscus flowers. The flowers of *Hibiscus rosa sinensis* (HRS) are available in Kuwait all year round . It is used internationally for a wide range of applications including hair care, herbal shampoo, antifungal, emollient agent and salad dressings. Dried hibiscus is edible and is often a delicacy in the State of Mexico. As a food element, it is safe for human consumption, because of its therapeutic values as described by Jadhav et al (2009) and Ruban & Gajalakshmi (2012). These usages indicate that the color as free or bound to a mordant such as Stannous chloride (SnCl₂) serves as natural safe color-retention agent and antioxidant with no side effects (Wikipedia 2014). Sharma et al (2004) reported the remarkable anti skin cancer property of HRS flower extract . A 90% ethanol extract of *Hibiscus rosa sinensis* was shown to function as an anti-solar agent by absorbing ultraviolet radiation (Sidram 2011). In our lab the cold 5% A.A extract of (HRS) was tested for visible and UV light absorption (Figure 1). The information given above about the (HRS) flowers extracts, rendered it as an ideal natural dye to be used by individual or industrial scale. The properties of the above dye were investigated in our lab for Kuwait Sadu House to provide a safe, harmless and non-hazardous dye, for the Bedouin fabric weavers. The extraction of the color was achieved with an environmentally friendly process, a permanent dark purple color was obtained that neither changed nor faded its color upon exposure to heat or light.

Material and Methods

1. Extraction of colorant using G.A.A or 5% A.A solution

Ten grams of (HRS) flower powder was cold extracted with 150 ml of pure G.A.A/ 5%A.A. It was stirred on magnetic stirrer overnight at ambient temperature. Then filtered through multilayer cheese cloth, the filtrate was lyophilized using freeze dryer.

2. Hot pre mordanting

The scoured threads mentioned above were treated with variable metal salts to obtain fixed colors of the flower extract. Each mg of the scoured threads was incubated with 50 ml of heated mordanting solutions (85°C) for one hour. Then the heat was switched off and mordanted threads remained in the solutions for 24 hours. Finally the threads were removed and dried under the shade.

Mordants used : Stannous chloride ; Alum ; Cobalt chloride ; Ferric chloride ; Potassium chromate; Magnesium sulphate

3. Dyeing

The premordanted threads (cotton & wool) were soaked (at a liquor ratio of 1:40) in 4ml of the filtrate of step 5a, b of the Figure 2 in two containers. One container was heated at 85°C using thermostated water bath for 2 hours, then remained at room temperature for 22 hours. The second container was incubated at room temperature for 24 hours.

4. Washing

Soaked the threads in excess volume of tap water and rinsed thoroughly until the water became clear and colorless. Sun dried the threads for 42 hours and mounted on labeled paper for display. The threads were pictured for color identification under direct sunlight.

Fig.(2)

Extraction of colorant using G.A.A or 5% A.A solution



Results and discussion

Table(1)

The 5% AA (HRS) extract gave a dark peach color only with the non-mordanted camel -wool thread when heated to 85°C. The Stannous chloride (SnCl₂) was used as a mordant and a purple color resulted under room temperature or heated. The color is always darker with wool than the cotton . SnCl₂ interaction with anthocyanin contributed to fixing the color which neither washed out with strong detergents nor faded away upon exposure to sun light for 42 hours (Gasmelseed et al 1989).

	Dyeing at 85°C		Dyeing at Room temperature	
Mordant	Cotton	Wool	Cotton	Wool
Non mordanted	[Image]	[Image]	[Image]	[Image]
Stannous chloride	[Image]	[Image]	[Image]	[Image]

Table(2)

Using different mordants with 5% AA (HRS) extract to obtain various permanent colors.

Mordant	Dyeing at 85°C		Dyeing at Room temperature	
	Cotton	Wool	Cotton	Wool
Non-mordanted	[Image]	[Image]	[Image]	[Image]
Stannous chloride	[Image]	[Image]	[Image]	[Image]
Alum	[Image]	[Image]	[Image]	[Image]
Cobalt chloride	[Image]	[Image]	[Image]	[Image]
Ferric chloride	[Image]	[Image]	[Image]	[Image]
Potassium chromate	[Image]	[Image]	[Image]	[Image]
Magnesium sulphate	[Image]	[Image]	[Image]	[Image]

Measurement of 15% AA (HRS) extract – absorption spectra Fig.(1)

One gram of powdered HRS flowers was extracted with 15ml of 5% AA. The filtrate was passed by 0.45µm filter unit for further purity. The absorption spectra of the samples were obtained using a spectrophotometer. The results are illustrated in Figure (1)

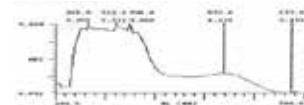
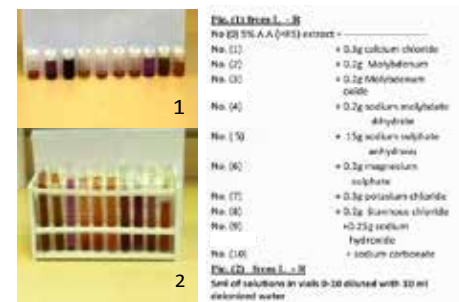


Table (3) Changing the red color of 5% A.A (HRS) extract with salts, other than salts used in table(2) under room temperature



The color obtained with the mentioned mordants in table (2) neither washed out with strong detergents nor faded away upon exposure to sun light for 42 hours, similar to the shikonin color extracted from *Arnebia decumbens* previously for “Sadu House”. The shikonin pigment did not need mordant to attain its excellent wash fastness. (Gasmelseed et al., 1989). The wash fastness of 5% AA extract of (HRS) with mordants and especially stannous Chloride is due to the formation of anthocyanin – Stannous. (A-S) complex . Its stability can be referred to the firm interaction of SnCl₂ with OH groups of cellulose in the cotton or the NH₂ groups of wool (Vankar and Shukla, 2011). The intensity of the dye increased when heated at 85°C (Table 2)

The Absorption spectrum of (HRS) extract with 5% AA (fig 1) shows that anthocyanin ; the red color of the extract absorb with maximum capacity (100%) at wave lengths 200-400nm, which is the range of UV harmful light ; and absorb the visible light at wave lengths 400-700 nm with 25% capacity. These properties envisage the potential of the anthocyanin to function as antioxidant or anti solar agent.

Conclusion:

- These results indicate that the 5% AA extract of (HRS) functions as antioxidant , and anti solar agent . If it is used for dyeing cotton or wool garments , it would protect the skin from the harmful UV light effect, which is the main cause of skin cancers.
- And if the 5% AA extract is used to dye cotton or woolen rugs or carpets , it will protect against color fading by sun light or heat. This is because the anthocyanins function as free radical scavengers .This property proved that the color as free or bound to a mordant such as Stannous chloride (SnCl₂) can serve as natural safe color- retention agent and antioxidant with no side effects.
- These experiments conducted in our lab provided a natural procedure of extracting the red color from (HRS) flower, fixing it (mordanting) and dyeing process. The 5%AA (vinegar) can be prepared from dates , 1 gram of the flower powder is mixed thoroughly with 15ml of vinegar , incubated for 2 nights then filtered. In case of mordant unavailability , the wool is soaked in the filtrate , exposed to the sun to dry. It will provide a permanent dark peach color to the camel wool (Table 1). If there is a mordant available then, follow step 2 under materials and Methods where a range of colors were obtained table(2) , for more choices of color one can refer to table(3).

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Assessing the genomic structure of an African cattle population “Sheko” using genome-wide autosomal markers

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Abstract

The most recent genetic evidences supported the theory of two centers of domestication for the humped *bos taurus indicus* (zebu) and hampless *bos taurus taurus* (taurine) cattle. They were domesticated at the Indian subcontinent and the Near East, respectively, about 10,000 BC. African cattle originated by subsequent introduction of taurine (~ 7000 BC) followed by zebu cattle (~ 700 AD) from their domestication centers to the continent. This has resulted in continuous introgression of zebu cattle into local taurine led to crossbred (admixed) populations, e.g. Ankole in Uganda and Sheko in Ethiopia. Here, we use genome-wide autosomal single nucleotide polymorphism (SNP) genotypes to investigate the genomic structure of an African cattle population from Ethiopia “Sheko”. The genotyped markers on this population revealed a level of genome admixture in Sheko cattle with the presence of African taurine and Asian zebu genetic backgrounds. Further analyses will be conducted to determine the exact level of each ancestry in the Sheko genome.

Introduction

Two domestic bovine subspecies, humped *bos taurus indicus* (zebu) and hampless *bos taurus taurus* (taurine), are found worldwide. It is highly supported that they were domesticated separately, about 10,000 years ago, at the Indian subcontinent and the Near East, respectively. Genetically these two subspecies demonstrate a degree of differentiation based on autosomal and mitochondrial markers. In Africa, admixed cattle populations, e.g. Sheko from Ethiopia, have been resulted by the introgression of Asian zebu cattle to the native African taurine about 1300 years ago⁽¹⁾. This genomic introgression can be detected now using the available genome-wide single nucleotide polymorphism (SNP) arrays.

Objectives

Evaluate the genomic structure of Sheko cattle population using genome-wide SNP data from the Illumina BovineSNP50 BeadChip

Materials and Methods

Cattle populations



Autosomal SNP genotyping using Illumina BovineSNP50 BeadChip version 1⁽²⁾

SNP quality control using R software version 2.15
 Minor allele frequency (MAF) ≥ 5%, SNP call rate ≥ 95%
 Samples quality control R software version 2.15
 Identity by state (IBS) < 95%, Sample call rate ≥ 95%

Principle component analysis (PCA) R software version 2.15

Results

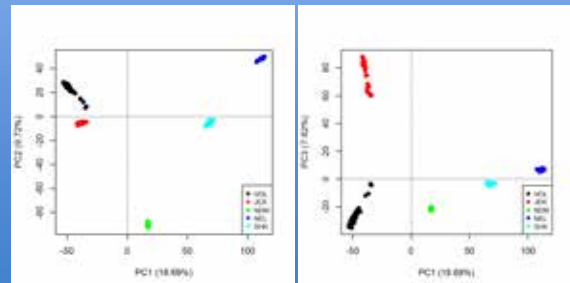
Table 1: Starting and final number of SNP due to quality control analyses

Starting SNP number	Excluded SNP with low MAF	Excluded SNP with low call rate	Overlap between MAF and call rate	Final SNP number
54,334	11,082	6,418	5,507	42,341

Table 2: Starting and final number of samples due to quality control analyses

Starting samples number	Excluded samples with high IBS	Excluded samples with low call rate	Final samples number
158	1 (Holstein)	0	157

Figures 1 and 2: PCA plots for the cattle populations included in the study based on the autosomal SNP markers (percentage of variation explained by the principle component (PC)).



Conclusion

- 1- The first principle component differentiates genetically between zebu and taurine cattle populations.
- 2- The second and third principle components separate N'Dama and Jersey populations from the other cattle populations, respectively.
- 3- The genome of the African cattle population “Sheko” shows a level of admixture between zebu and African taurine ancestries

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Acknowledgment

This study is part of the ideal project funded generously by the Wellcome trust (Project no. 079445). I would like to thank all the farmers supplying the EASZ samples, and the lab members who have extracted the DNA from the blood samples to be genotyped with the SNP markers.

Analyzing the full mitochondrial DNA of East African Shorthorn Zebu: Haplotypes diversity and signatures of selection

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Abstract

The bovine full mitochondrial DNA (mtDNA) sequence has divided domestic cattle to different sub-haplogroups, encompassing the main T (taurine-specific) and I (zebu-specific) macro-haplogroups, with some breeds carrying rare Q and R haplogroups. Given the importance of the mitochondria in cell energy production, mtDNA is expected to be a target of natural selection. We report here the comparison of the full mtDNA sequences of indigenous East African Shorthorn Zebu cattle (EASZ) from Kenya with cattle breeds from Europe, Africa and Asia addressing two questions; i) the extent of EASZ mtDNA genetic diversity, and ii) the presence of signatures of positive selection in African taurine mtDNA. Our results indicated that the EASZ mtDNA sequences are all of the taurine type and members of T1a, T1b and T1b1 sub-haplogroups. Interestingly, within African cattle, we identified a signal of positive selection in the *Cox-2* gene within the T1b/T1b1 sub-haplogroups, together the most common sub-haplogroups on the continent. This may indicate a probable advantage for these sub-haplogroups in Africa.

Introduction

The bovine mtDNA D-loop has classified the two domestic cattle subspecies; hapless taurine and humped zebu, into two main haplotype groups "haplogroups": T (taurine) and I (zebu)¹. The T haplogroup has been further classified into T1 (mainly in African cattle), T2 and T3 (mainly in European cattle), T4 and T5 haplogroups. The full bovine mtDNA sequence has subdivided the T1 haplogroups into 6 sub-haplogroups (T1a, T1b, T1c, T1d, T1e and T1f) with the T1b as the most common type in African cattle². Interestingly, all African zebu cattle carry taurine-specific mtDNA with no evidences of the zebu type in the continent³. This might be related to a selective advantage of the taurine mtDNA in Africa, or a historic male-mediated Asian zebu introgression into African taurine cattle.

Objectives

- Evaluate the mtDNA diversity of EASZ cattle from Kenya
- Identify signatures of selection on EASZ mtDNA.

Materials and Methods

Cattle populations with full mtDNA sequence

Cattle type	Number of populations	Number of samples
EASZ	1	13
Asian taurine	6	16
European taurine	10	28
African taurine	8	19
Yak	2	2
European auroch	1	1

Signatures of selection analysis

Codon-specific ω ratio (Dn/Ds)

CODEML package of PAML 4.6 software

mtDNA diversity analysis

Neighbour-joining phylogenetic tree

MEGA 5.05 software

Median-joining Network

Network 4.6 software

References

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Acknowledgment

I would like to thank all the farmers supplying the EASZ samples, and the lab members who have extracted the mtDNA to be sequenced. A big thank for Dr. Sara Goodacre from University of Nottingham for her help with PAML software.

Results

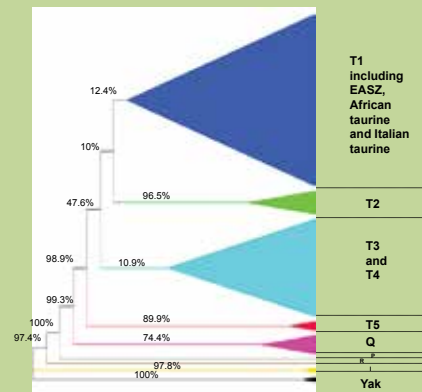


Figure 1: Unrooted neighbour-joining (NJ) tree of all mtDNA sequences included in this study, with 1,000 bootstrap replications. Equal branch lengths are for the purpose of illustration only.

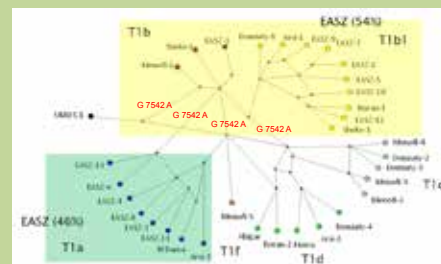


Figure 2: Median-joining network analysis including 13 EASZ (proportion of samples), 1 N'Dama and 18 African cattle with known mtDNA sub-haplogroup types (refer to Bonfiglio *et al.*, 2012). Branch lengths are unscaled. Branches leading to T1b and T1b1 sub-haplogroups are labelled with the diagnostic polymorphism (G7542A). Positions correspond to the UMD3.1 bovine reference sequence.

Model	No. of parameters	log likelihood value	2ΔL	Positively selected sites (posterior probability >95%)
M1a (nearly neutral)	2	-1075.66	4.98	
M2a (positive selection)	4	-1072.17	(P-value=0.082)	
M7 (nearly neutral)	2	-1075.32	6.44	
M8 (positive selection)	4	-1072.1	(P-value=0.04)	G7542A (D57N)

Table 1: The log likelihood values of the different site models implemented in CODEML package for *Cox-2* mtDNA gene in African cattle. Sites considered as positively selected with posterior probability > 95%.

Conclusion

- 1- The EASZ samples are affiliated to T1a, T1b and T1b1 sub-haplogroups, with the majority are within T1b and T1b1.
- 2- The T1b sub-haplogroup diagnostic marker is predicted to be under positive selection in African cattle indicating that T1b might be considered as an advantageous mtDNA type in Africa.

Degree of Bengalness:

A measure of the measure of genomic contribution of Asian Leopard Cats into Bengal breed cats

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The idea & Significance

The Bengal breed cats result from hybridizing domestic cats (DOM) and Asian Leopard Cats (ALC). First generation hybrids can be further crossed to domestic cats and still be considered Bengal cats as long as phenotypic and behavioral characteristics retained (see cat below). The ALC genomic contribution into registered Bengal cats is usually unknown and likely variable.

Significance of the study was to develop a panel of diagnostic markers to measure ALC genomic contribution in Bengal cats (degree of Bengalness). The panel can be used to study the genetics of the Asian Leopard cat and the ALC-DOM introgression zones in the wild.

Dataset: • A total of 2161 cats (from 48 breeds/populations) genotyped using the 63K Feline SNP array were used.

Objective 1: Identify diagnostic markers that are fixed for different alleles in the two groups (ALC & DOM)

Dataset: • ALC (N = 9) and domestic cats (N = 1765).

- Analysis:**
- Calculate the allele frequency for each marker in each group independently.
 - Select the markers that are fixed with allele 1 (A1) in ALC and absent in domestic cats or have a minor allele frequency < 0.05.
 - Evaluate the positions of the selected markers.
 - Select a subset of the identified markers with near uniform inter-marker distances.

- Findings:**
1. 674 markers were identified as diagnostic markers and they were distributed in all 19 cat chromosomes (Fig. 1a).
 2. To avoid markers being in linkage disequilibrium, 287 were selected with an inter-marker distance ~ 5 Mb (Fig. 1b).

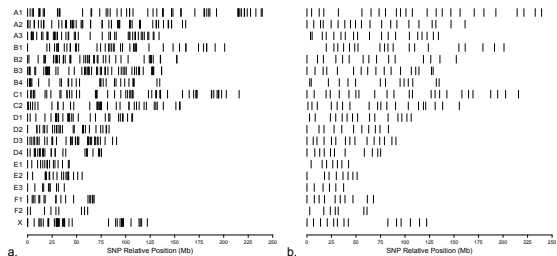


Fig. 1: Distribution of ALC specific markers along cat chromosomes. (a) Relative positions of all markers identified. Many markers are close to one another and may be in linkage disequilibrium. (b) Relative position of a subset of markers from (a) where markers are ~ 5Mb apart.

Objective 2: Estimate the genomic contribution of ALC in: (1) known pedigree, (2) Bengal breed, (3) Other cat breed

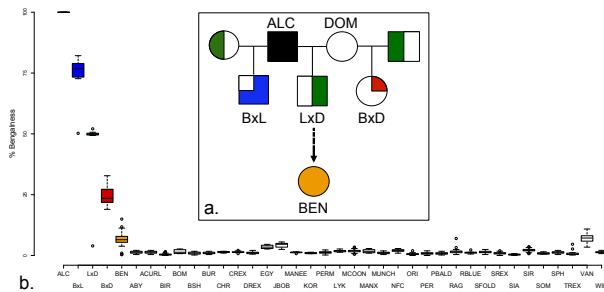


Fig. 2: Genomic contribution of ALC. (a). Known pedigree crosses of ALC-DOM. LxD: first generation hybrid, BxL: backcross to ALC, BxD: backcross to DOM, BEN: Bengal cat unknown pedigree (b). Percent bengalness in known pedigree, random bengal cats, and other cat breeds.

Groups	Theoretical	Mean (Observed)	s.d.(Observed)
ALC	100	100	0
BxL	75	73	10.75
LxD	50	47	11.5
BxD	25	24.5	3.5
BEN	unknown	7	2
DOM	~ 0	1.25	0.5

Table 1: Theoretical and observed percent bengalness in different cat groups.

Dataset:

- Diagnostic panel (All: 287 markers, Auto: 262 markers).
- ALC-DOM pedigree (N = 98), random Bengal cat (N = 98), and 33 cat breeds (N = 1452).

- Analysis:**
- Calculate % of ALC alleles (% bengalness) in each individual using autosomal markers only.
 - Using known pedigree samples, estimate range of % bengalness and validate the estimates using pedigree information.

- Findings:**
1. Known ALC-DOM pedigree (Fig. 2a) provides information about theoretical % bengalness. In pedigree samples, theoretical and observed are similar (Fig. 2b, Table 1).
 2. Random Bengal cats on average have ~ 7% bengalness whereas other cat breeds, combined, exhibit ~ 1% with some variations (Table 1).
 3. Proportion of ALC into Bengal cats is unmatched by any of the other breeds with the exception of Turkish Van (Fig. 2b).
 4. The relatively low % bengalness of random Bengal cats indicates multiple crosses to DOM or breeding between Bengal cats.
 5. Using 262 (autosomal) diagnostic panel is sufficient to identify Bengal cats and estimate ALC contribution.

Objective 3: Estimate the number of generations that gives a particular % bengalness

Dataset: • ALC-DOM pedigree (N = 98), random Bengal cat (N = 98).

- Analysis:**
- Use estimated % bengalness in each group.
 - Determine the number of generations crossed to DOM that results into random Bengal cats.
 - Use the theoretical relationship between % bengalness and number of generations crossed to domestic depicted as:

$$\% \text{ Bengalness} = 100 \times \left(\frac{1}{2}\right)^{\# \text{ generations}}$$

- Infer theoretical number of generations since the initial hybridization for each Bengal cat .

- Findings:**
1. First generation hybrids (LxD) exhibit small variation in % bengalness while backcross to ALC (BxL) and DOM (BxD) show significant variation between individuals (Fig. 3).
 2. The % bengalness of random Bengal cats places them in the range of 3-5 generations of theoretical hybridization with concentration around generation 4 (6.75%) (Fig. 3).
 3. Variation in % bengalness can be explained by breeding between dissimilar (ALC-DOM) and similar (BEN-BEN) individuals.
 4. The small variation of % bengalness among Bengal cats is a sign of state equilibrium that results from breeding between Bengal cats or infrequent introduction of ALC or DOM alleles into the breed.

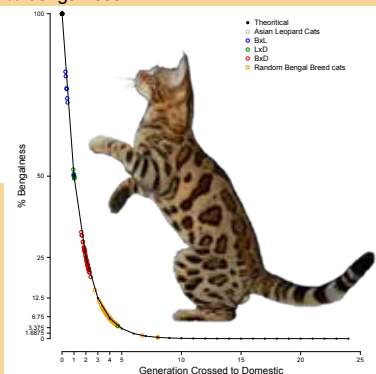


Fig. 3: Percent bengalness as function of generation number.

Successes and challenges of genome-wide association (GWA) analyses in cats

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Introduction

- Genome sequencing projects enabled the identification of millions of single nucleotide polymorphisms (SNPs) between individuals. Genotyping SNPs in large number of individuals using the high throughput technology and using population based analyses allowed identifying disease and phenotype mutation without the need of an extended pedigree.
- The sequencing of several cat genomes resulted in the development of **illumina infinium iSelect 63K cat DNA array**.
- The 63K Feline array contains genome-wide markers that can be genotyped at a low cost and assist in the identification of cat diseases and aesthetic traits.

Objective

Test the utility and power of the 63K Feline SNP chip in performing genome-wide association studies (GWAS) for autosomal recessive, autosomal dominant, and X-linked phenotypic traits.

Dataset and Analyses

- A comprehensive genotype dataset of over 2000 cats (breeds and random bred) was used as the sample source of the analyses. For each GWAS, a subset of cases and control were carefully selected (Fig. 1).
- Case-control GWA analyses were performed using the open source program *PLINK*.
- For three autosomal recessive traits (dilute coloration, point coloration, and long hair), the causative variant is on the array and was genotyped. Linkage disequilibrium (LD) between the causative marker and adjacent markers was calculated using the genetics package in R, which allowed estimating the power of the array [5].

1. Autosomal recessive trait in random bred population

- GWA analysis of autosomal recessive **dilute color** [1] using random bred cases and controls resulted in a single significant marker (Fig. 1a). The significant marker is the causative marker intentionally placed on the array.
- The absence of other associated markers is due to the low LD between the causative marker and nearby SNPs (Fig. 1a-inner plot). For the closest marker to have similar association power, the number of samples need to be increased from 114 to 427.

2. Autosomal recessive trait in a breed and under selection

- GWA analysis of autosomal recessive **point color** [2] using Himalayan (pointed Persian) cats as cases and Persian cats as controls resulted in a large number of significant markers (Fig. 1b).
- The presence of many associated markers in addition to the causative mutation is due to the high LD between the causative marker and near by and distant SNPs (Fig. 1b-inner plot). The high number of linked markers to the causative mutation is a result of the artificial selection. For the closest marker to have similar association power, the number of samples need to be increased from 49 to 50.

3. Autosomal recessive trait in a breed without selection

- GWA analysis of autosomal recessive **long hair** [3] using La Perm cats cases and controls resulted in several significantly associated markers (Fig. 1c).
- Adjacent markers are in high LD with the causative mutation (Fig. 1c-inner plot). Due to the absence of intense selection pressure for the trait in the breed, the number of linked markers is smaller than the point color example (above). For the closest marker to have similar association power, the number of samples need to be increased from 54 to 66.

4. Autosomal dominant trait in a breed and under selection

- GWA analysis of autosomal dominant **curly hair** [4] using Selkirk Rex cats as cases and straight hair Selkirk Rex and Persian cats as controls resulted in a number of significant markers (Fig. 1d). The association analysis resulted in the identification of the causative mutation as published in [4].
- The dominant trait was identified with as low as 9 cases and 29 controls. The successful association outcome is likely due to the selection pressure on the trait.

5. X-linked trait in random bred population

- GWA analysis of X-linked **orange color** [5] using random bred cases and controls resulted in a few significant markers (Fig. 1e). The associated markers reside in the same linkage region previously identified [5].
- The placement of the orange color locus in the same published region using as little as 24 cases suggests a power in the current density of the array for detecting association on the X-chromosome.

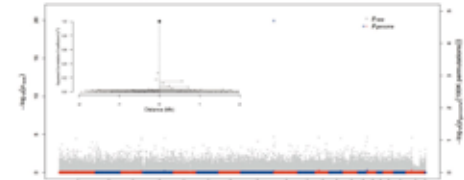
Conclusion

- The current density of the Feline array (63K) is sufficient to detect association of recessive and dominant traits/diseases (1) under selection, (2) in small populations, and (3) resulting from a recent mutation.
- X-chromosome markers are likely to detect association for sex specific traits/diseases.
- The current density of the array is not enough to detect association in random bred populations.

Trait: Dilute color, Population: Random bred, Cases: 33, Control: 81, Haplotype: NA



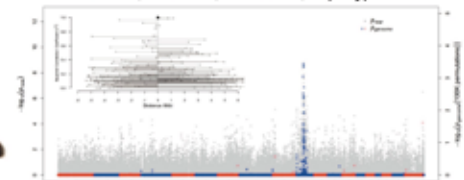
a.



Trait: Point color, Population: Persian breed, Cases: 21, Control: 28, Haplotype: ~1Mb



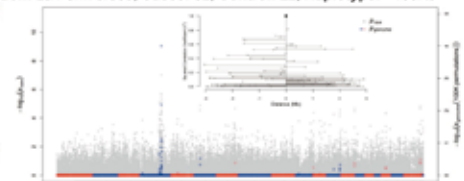
b.



Trait: Long hair, Population: La Perm breed, Cases: 32, Control: 22, Haplotype: ~150Kb



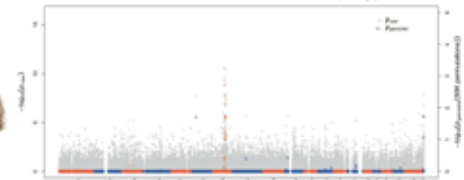
c.



Trait: Curly hair, Population: Selkirk Rex breed, Cases: 9, Control: 29, Haplotype: ~600Kb



d.



Trait: Orange color, Population: Random bred, Cases: 24, Control: 69, Haplotype: ~1.5Mb



e.



Fig.1. Illustrative genome-wide association analyses for five phenotypic traits in the domestic cats. a-c) Remapping of three autosomal recessive traits using different populations. Causative variants of the three traits were previously identified [1-3] and markers are included on the 63K SNP chip. d) Reproducing GWAS of an autosomal dominant trait [4]. e) GWAS of X-linked trait that was previously localized to X chromosome region [5]. Manhattan plots (a-e) of the association analyses where x-axis represent chromosomes, gray dots and left y-axis represent raw P-values of the association, and red/blue dots and right y-axis represent the permuted P-values. Inner graphs in (a-c) shows the LD between the trait's causative mutation (black dot) and adjacent markers (gray dots).

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Laying a string NOT filling a vessel: Genome papers as an active teaching and learning tool

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Introduction

- **"Laying a string"** and **"Filling a vessel"**, as described by Noam Chomsky, are two models of education that are strikingly different in approach and outcome.
- **"Laying a string"** model is an active teaching and learning method where students are provided with a string that can guide them through their learning journey. The active experience is likely to enhance students information retention abilities.
- **"Filling a vessel"** model is comparably a passive method and students are likely to serve as vessels that get filled with information that is returned during exams and never retained.
- **Genomics** is a relatively new field of biology that relies on understanding the entire genetic content that is referred to as **"genome"**.
- Genomics is an interdisciplinary field that lies in the intersection of biology, genetics, bioinformatics, computer science, and engineering.
- Genomics is responsible for understanding of the basics of living organisms and is applied in medicine, agriculture, food production, and industry.

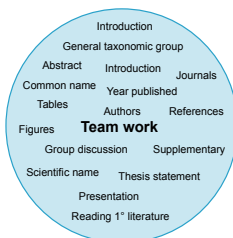
Objectives

- Applying **"Laying a string"** model in the teaching of genomics course (485).
- Using published peer-reviewed genome papers as a **"string"** to guide students in discovering:
 - 1) Academic concepts - **"Academic string"**.
 - 2) Genome and genomics concepts - **"Genomics string"**.

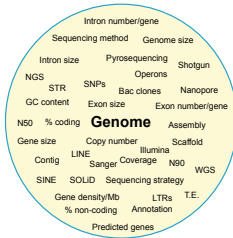
Strategies

- The "string" laid out for students was as follows:
 1. Select three organisms that are taxonomically related.
 2. Conduct a literature search and find the genome papers of the three organisms.
 3. One paper can be old (before 2010) and two must be published after 2010.
 4. Download and/or print the three papers and related supplementary material.
 5. Understand the structure and content of scientific papers using the "Academic string" (see below) and its concepts.
 6. Independently, search for concepts as an assignment.
 7. Discuss and share the learned academic concepts with peers in groups.
 8. Review peers' findings by exchanging papers in class.
 9. Change group formation every class.
 10. Apply the same strategy to the "genomics string" (see below).

Academic String



Genomics String



"Academic string" outcome

- Students experienced searching for peer-reviewed articles and learned the difference between open access journal and subscription based ones.
- 28 genome papers were selected 9 of which were of model organisms and 19 of non-model (6 prokaryotes and 22 eukaryotes).
- Students identified paper elements (title, abstract, introduction etc.) and were able to locate the expected information in each element. For example, the title should contain the common name and/or scientific name of the organism and the word genome.
- Students Gained the ability to correctly extract information from their selected papers and verify the extracted information from their peers' papers.
- While focusing on their papers, students were given the chance to review all other paper during the group discussion session and the paper exchange activity.
- Students learned the basics of presenting their selected papers using a comparative genomics approach and focusing on specific hypotheses.

"Genomics string" outcome

- Using the genome paper as a string, students first explored the various genome sequencing strategies (Bac clone sequencing and whole genome shotgun (WGS) sequencing).
- DNA sequencing methods (Sanger, illumina, Pyro etc.) were covered as students identified the methods in their papers.
- Genome assembly process and the measure of assembly quality (contig N50 or scaffold N50) were illustrated as students found variation in these measure across the genome papers.
- The reported genes in each genome paper guided introducing structural annotation of sequenced genome while distinguishing it from the laborious functional annotation.
- The coding portion of genomes (genes) and its different components was covered as students identified them in their papers and supplementary material accompanying the papers.
- The variation in non-coding component of eukaryotic genomes was used as a guide to introduce tandem and interspersed repeats.
- Intra-species sequence variation represented by (single nucleotide polymorphisms – SNPs) found in each genome paper facilitated teaching and learning about the usability of variation to deduce evolutionary history and mapping of traits.

Stretching the "Genomics string"

- The student extracted data from their genome papers was used collectively to answer questions raised as genomic concepts were covered. Below are examples of questions and their answers.
- **How often are the different sequencing strategies implemented in the past two decades?**

The WGS is the predominant sequencing strategy in recent years and a reduced implementation of sequencing back clones due to its labor intensive and time consuming nature (Fig. 1a).

- **What is the evolution of sequencing methods in the past two decades?**

Sanger remains a powerful sequencing method due to the length of the reads generated. The sequencing methods referred to as "Next Generation Sequencing -NGS" are relatively recent methods that focuses on the high throughput of short reads (Fig. 1b).

- **What is the relationship between genome size and number of genes?**

While prokaryotic genomes may show a linear relationship between genome size and gene number, the size of eukaryotic genomes (including ours!) is not, which is a result of the inflation in the non-coding (repetitive) genomic content (Fig. 1c).

- **Is there a difference in nucleotide composition of extremophiles vs. non-extremophiles?**

The genomes of extremophiles exhibits higher percentage of GC content than their non-extremophile counterparts to insure the survival and stability of the genetic material (Fig. 1d).

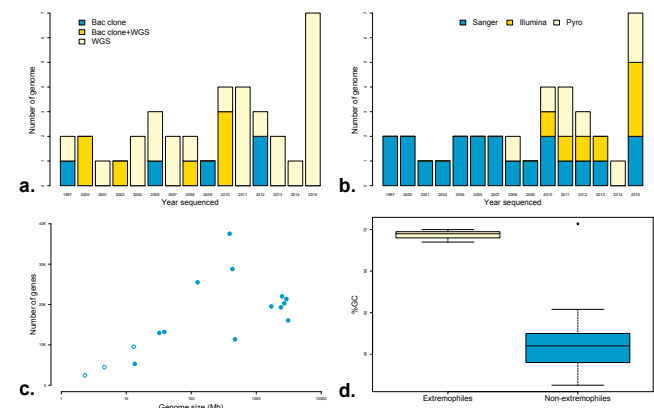


Fig.1. Comparative genomic analysis of students' extracted data. a-b) Graphs showing the genome sequencing strategy and method, respectively, over 18 years period. c) Relationship between genome size and number of genes across range of organisms. Empty circles represent prokaryotic genomes and filled circles represent eukaryotic genomes. d) Comparison between the GC content of extremophile genome versus non-extremophile genome.

Conclusion

The active teaching and learning method of **"laying a string"** has, as students testified, proven to be a fun and versatile way to learn about the science of genomes, engage in discussions, and independently answer significant biological questions.



Re-sequencing the full LPL gene identifies novel SNPs in Kuwaitis of Arab ethnicity

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Background

The nutrition of Kuwaitis is relatively high in fat and the life style adapted by many in the Kuwaiti population may lead to an increase in many of the risk factors leading to heart disease. A major risk factor is dyslipidemia including cholesterol (TC), triglycerides (TG), and low-density lipoprotein (LDL) as well as decreased high-density-lipoprotein (HDL) which are commonly present among the Kuwaiti population. Genetic association studies including Genome Wide Association Studies (GWAS) have attempted to elucidate the genetic and molecular mechanisms of dyslipidemia and have identified a limited number of candidate genes and pathways relevant to lipid metabolism and/or transport implicating lipoprotein lipase (*LPL*) (Chasman et al., 2008; Aulchenko et al., 2009; Deo et al., 2009; Weissglas-Volkov et al., 2010). *LPL* is an important rate-limiting enzyme for the hydrolysis of circulating TG into nonesterified fatty acids and 2-monoacylglycerol for tissue utilization and HDL formation. The 475 amino acid protein is encoded by a 30 Kb gene, mapped to chromosome 8p22, that have been fully sequenced (Deeb & Peng, 1989). Over one hundred single nucleotide polymorphisms (SNPs) have been identified within both the coding and noncoding region. Most variants have been based almost entirely on populations of European and African descent (Pirim et al., 2014; Pirim et al., 2015). Studies on the association of lipid level variation in some other ethnic groups have reported conflicting findings with regards to the observation of significance for various SNPs at the *LPL* gene locus emphasizing the importance that reported "common" and "rare" alleles could vary between different ethnic groups and across different populations (Tang et al., 2010; Deo et al., 2009). Moreover, the majority of genetic markers associated with disease have been observed in non-coding region. This project aimed to screen for putative mutations by re-sequencing the *LPL* gene loci in a sample of 100 Kuwaiti Arabs. The study is based on the hypothesis that rare SNPs contribute significantly to lower plasma HDL-C and higher TG levels under the assumption that mutations which impair TG and HDL production should be significantly more common at one extreme. The proposed study is the first to report sequence data and analysis at the *LPL* gene loci from an Arab ethnic group.

Objectives

1. Identify putative mutations at the *LPL* gene loci by sequencing DNA from 100 Kuwaiti samples of known Arab ethnicity.
2. Align and compare sequence data with a reference sequence deposited in GenBank to identify "common", "rare" and "novel" SNPs.

Materials & Methods

Sample Description: The samples sequenced were obtained from DNA extracted from 100 Kuwaiti's of Arab ethnicity (based on both paternal and maternal lineages traced back at least four generations). These samples included 50 males and 50 females aged between 18-56 years and were selected from the established DNA Bank (SL05/03 and SL09/07). Each sample had documented phenotypic data and informed consent. Ethical approval was obtained.

Re-sequencing Protocol and Analysis: Based on the complete published human reference sequence in GenBank (<http://www.ncbi.nlm.nih.gov/NCBI>), 74 different primer sets flanking a 700bp region throughout the *LPL* gene (30Kb gene loci and 1Kb downstream and upstream of the gene) were designed using Primer 3, optimized and used. PCR was used to amplify the regions. The purified products were sequenced with a forward primer using BigDye Terminator kit (Version 3.1). The products were then subjected to denaturation using an X-Terminator kit. A separate sequencing reaction was performed using a reverse primer on all the samples for quality assurance. The samples were then sequenced with the ABI 3130xl genetic analyzer (GS01/02) and the data was analyzed by the AB DNA sequencing Analysis Software (version 5.2). All the regions were successfully aligned using multiple sequence alignment and screened for SNPs. The verified sequences obtained were aligned and compared with the published reference sequence in the GenBank database (NG_008855.1) using the AB Seqscape software.

Results

Re-sequencing Protocol: A total of 74 primer sets to amplify overlapping regions across the full *LPL* gene was successfully designed and established. The annealing temperature ranged from 62-66 °C with an average of 64°C. The product sizes range from 408-700bp with an average of 554bp. A total of 74 reactions was needed to sequence the full 5' to 3' template strand for each sample yielding a total of 148 reactions for both strands.

Sequence analysis and alignment: The full *LPL* gene locus (size: 33,755 bp) from nucleotide position 19934070 to 19967825 on chromosome 8 was successfully sequenced in all 100 samples. The full Kuwait Arab sequence demonstrating all the novel SNPs was deposited in GenBank with an accession number KU557518.

SNP identification and analysis: A total of 293 variants including 255 SNPs and 38 indels were identified. Of these, 246 were previously reported and their functional significance has been documented. A total of 47 novel variants were identified and characterized (Table 1). The position of all the identified variants (n=293) are demonstrated in figure 1.

Discussion & Conclusions

Re-sequencing the full *LPL* gene was successful for all 100 samples and the full sequence data with the novel SNPs have been deposited in GenBank (Accession Number). The novel SNPs are now being validated in 1000 samples of the Kuwaiti general population. The status of the "rare" alleles as being "protective", "risk" or "no effect" on plasma TG and HDL-C levels are also being investigated by the analysis of the genetic association of 18 identified reported SNPs and 11 novel SNPs with various lipid levels such in the general Kuwaiti population (n=1000). In addition, DNA regions that have been identified with the novel mutations have been cloned and libraries were constructed for future reference and documentation.

The data obtained so far has provided significant sequence data analysis and variant functional analysis at the *LPL* gene locus for the first time in Kuwaiti's of an Arab ethnic group. The possible association of certain variants with various lipid levels such as TG and HDL-C in that may increase or decrease the risk to develop dyslipidemia in Kuwaiti Arabs is currently being investigated which will be useful for future studies on the etiology and treatment of dyslipidemia and associated diseases such as CHD.

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Table 1. List of the novel SNPs at the LPL gene loci in the re-sequenced 100 samples of Kuwaiti Arabs

Sl. No.	SNP	Chromosome Location	MA Freq	MA Freq	Consequence
1	Novel SNP 1	8:19934341-19934342	-	0.040	upstream_gene_variant
2	Novel SNP 2	8:19934643-19934643	-	0.110	upstream_gene_variant
3	Novel SNP 3	8:19934791-19934792	-	0.070	upstream_gene_variant
4	Novel SNP 4	8:19935408-19935408	0.995	0.005	upstream_gene_variant
5	Novel SNP 5	8:19935157-19935158	-	0.090	upstream_gene_variant
6	Novel SNP 6	8:19936234-19936235	-	0.100	upstream_gene_variant
7	Novel SNP 7	8:19936578-19936578	0.990	0.010	upstream_gene_variant
8	Novel SNP 8	8:19936636-19936636	0.995	0.005	upstream_gene_variant
9	Novel SNP 9	8:19937211-19937211	0.990	0.010	upstream_gene_variant
10	Novel SNP 10	8:19937232-19937233	1.000	-	upstream_gene_variant
11	Novel SNP 11	8:19937274-19937274	0.995	0.005	upstream_gene_variant
12	Novel SNP 12	8:19937783-19937783	0.995	0.005	upstream_gene_variant
13	Novel SNP 13	8:19938389-19938389	0.995	0.005	upstream_gene_variant
14	Novel SNP 14	8:19938609-19938609	0.995	0.005	upstream_gene_variant
15	Novel SNP 15	8:19939059-19939059	0.990	0.010	5_prime_UTR_variant
16	Novel SNP 16	8:19939272-19939272	-	0.010	non_coding_transcript_exon_variant
17	Novel SNP 17	8:19940038-19940038	0.990	0.010	intron_variant
18	Novel SNP 18	8:19941997-19941997	0.995	0.005	intron_variant
19	Novel SNP 19	8:19942062-19942062	0.995	0.005	intron_variant
20	Novel SNP 20	8:19942076-19942077	-	0.080	intron_variant
21	Novel SNP 21	8:19942844-19942844	0.995	0.005	intron_variant
22	Novel SNP 22	8:19945173-19945173	0.995	0.005	intron_variant
23	Novel SNP 23	8:19946250-19946250	0.995	0.005	intron_variant
24	Novel SNP 24	8:19947485-19947485	0.995	0.005	intron_variant
25	Novel SNP 25	8:19947845-19947845	0.995	0.005	intron_variant
26	Novel SNP 26	8:19948936-19948936	1.000	-	intron_variant
27	Novel SNP 27	8:19952774-19952774	0.990	0.010	intron_variant
28	Novel SNP 28	8:19955496-19955496	0.985	0.015	intron_variant
29	Novel SNP 29	8:19955498-19955498	0.995	0.005	intron_variant
30	Novel SNP 30	8:19955302-19955302	0.995	0.005	intron_variant
31	Novel SNP 31	8:19955004-19955004	-	0.110	intron_variant
32	Novel SNP 32	8:19955036-19955036	-	0.030	intron_variant
33	Novel SNP 33	8:19955875-19955875	-	0.050	intron_variant
34	Novel SNP 34	8:19955935-19955935	0.995	0.005	intron_variant
35	Novel SNP 35	8:19955953-19955953	-	0.010	intron_variant
36	Novel SNP 36	8:19959799-19959799	1.000	-	intron_variant
37	Novel SNP 37	8:19959940-19959940	0.995	0.005	intron_variant
38	Novel SNP 38	8:19962529-19962529	0.990	0.010	intron_variant,regulatory_region_variant
39	Novel SNP 39	8:19963567-19963568	-	0.010	intron_variant
40	Novel SNP 40	8:19963891-19963891	0.995	0.005	intron_variant
41	Novel SNP 41	8:19964662-19964662	0.995	0.005	intron_variant
42	Novel SNP 42	8:19964869-19964869	0.995	0.005	intron_variant
43	Novel SNP 43	8:19965014-19965014	0.995	0.005	intron_variant
44	Novel SNP 44	8:19965760-19965760	0.995	0.005	3_prime_UTR_variant
45	Novel SNP 45	8:19966866-19966866	0.995	0.005	3_prime_UTR_variant
46	Novel SNP 46	8:19967489-19967489	0.995	0.005	downstream_gene_variant
47	Novel SNP 47	8:19967551-19967551	0.995	0.005	downstream_gene_variant

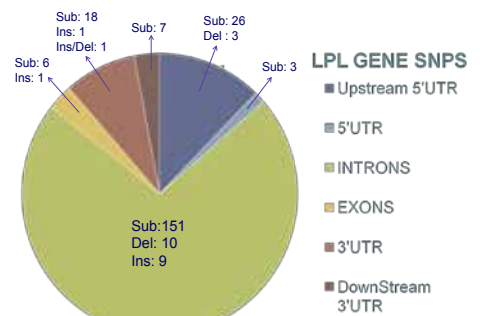


Figure 1. The number (n=293) and classification of SNPs identified at the LPL locus in the re-sequenced 100 samples of Kuwaiti Arabs. Sub: base pair substitution; Ins: insertion; Del: deletion

Acknowledgment

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Stability and Inheritance of Flax's Linum Insertion Sequence (LIS-1) in Transgenic Plants

Nasmah K. Bastaki, Ph.D.
and
Christopher A. Cullis, Ph.D.

Abstract

The Linum Insertion Sequence (LIS-1) is a unique element appearing as a site-specific insertion event by flax reproductive tissue. The LIS-1 sequence is assembled from small sequences found scattered throughout the genome, and inducing (stress) conditions can result in these sequences rearranging and joining together to build the full LIS-1 sequence, which is stably inherited in flax. This study reports the development of transgenic flax plants containing LIS-1 in their genome and to follow LIS-1 stability and inheritance in subsequent generations. *Agrobacterium tumefaciens* was used to generate transgenic flax plants (seven different *Arabidopsis thaliana* accessions) and transform them into *Arabidopsis thaliana*. In both plants, the regions flanking LIS-1 in the T-DNA construct were sequenced and compared with the LIS-1 sequence in the flax genome. The results suggest that the LIS-1 element is also present in *Arabidopsis thaliana*, since both are capable of destabilizing the intact LIS-1 element; both plants had the ability to convert intact "exogenous" LIS-1 into its "target site" after transformation with LIS-1 only.

Introduction

The *Linum caudatum* genome is highly repetitive, which is its stress and site. In response to nutrient stress, specific flax flax copy insertion termed Linum Insertion Sequence (LIS-1). Stomach Cirrus (known as "Static" or PI) is the responsive parental line and several other lines (called genotypes) have been derived from this parent line (Figure 1). LIS-1 is a 5.79 kb sequence, that is inserted into a specific, single copy target sequence in the PI genome (referred to as the "target site") when grown under the inducing stress condition of low nutrients. A comparison between the lines with and without LIS-1 insertion have revealed that the progenitor target sequence becomes highly modified when LIS-1 is inserted. A total of 124 mismatches were observed between the LIS-1 sequence and the target site, which continues to remain stable. The absence of the intact LIS-1 from the progenitor PI and its presence in the S genotypes has been demonstrated by southern analysis, whole genome sequencing and PCR (Figure 3).

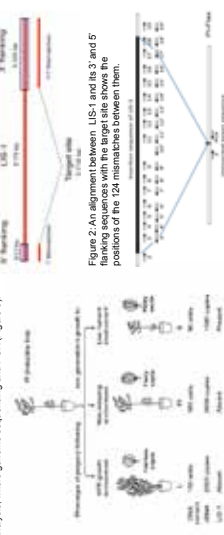


Figure 2. A schematic diagram showing the structure of the LIS-1 element. The LIS-1 element is flanked by two inverted repeats (IR) and contains a target site. The diagram also shows the LIS-1 element in the context of the flax genome, with the target site and the LIS-1 element being highlighted in red.

Figure 3: The structure of the target sequence with and without LIS-1 insertion in PI flax. Primers 2, PI3, and PI4 were designed across the insertion sequence of LIS-1. Primers 2 through 19.

Aim of the Study

To determine whether LIS-1 was a unique event to the flax family or would it mobilize in other plant species. Also, to determine how would flax varieties deal with an intact "exogenous" form of LIS-1.

How to achieve that?

By developing transgenic *Arabidopsis thaliana* and flax varieties containing "exogenous" LIS-1 in their genome and to follow its stability and inheritance in subsequent generations.

Methods

Preparing the construct: *Arabidopsis thaliana* (LIS-1) inside the *Agrobacterium tumefaciens*.

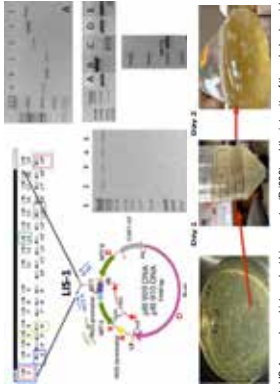


Figure 4. LIS-1 was cloned into a plant binary vector (PI600) and the integrity of the whole plasmid (PI600+LIS-1) was checked using PCR with different primers. Then, the plasmid (PI600+LIS-1) was transformed into *Agrobacterium tumefaciens* using the "floral dip" method.



Results

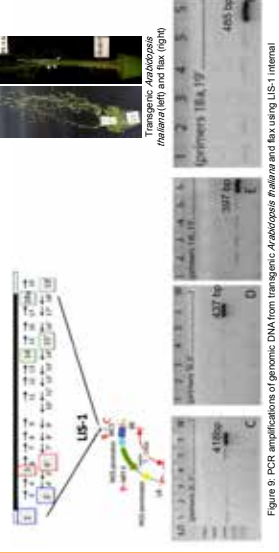


Figure 9. PCR amplifications of genomic DNA from transgenic *Arabidopsis thaliana* and flax using LIS-1 internal primers: 2,3 -56', 4,15', 16a,19'.

None of the transgenic *Arabidopsis thaliana* and flax amplified the whole of LIS-1 using primers 2 and 19' (results not shown). However, they amplified sub-fragments of LIS-1; these sub-fragments are highlighted in the colored boxes above.

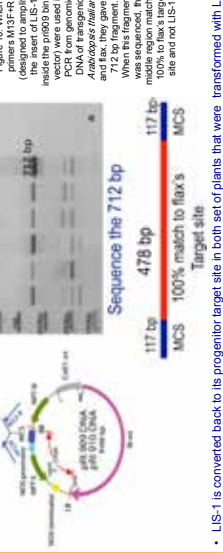


Figure 10. When primer M13F+R (designed to amplify inside the pR609 binary vector) were used in the PCR, the DNA of transgenic *Arabidopsis thaliana* and flax, they gave a band at 712 bp. When this fragment was sequenced, the results showed 100% to flax target site and not LIS-1.

LIS-1 is converted back to its progenitor target site in both set of plants that were transformed with LIS-1 only; in other words the results show: "The creation of the progenitor "target site" of LIS-1" following transformation with LIS-1 only.

Summary

In transgenic *Arabidopsis thaliana* accessions and flax varieties:

- The "exogenous" LIS-1 was not found intact in any transformed plants regardless of the growth conditions. However, sub-fragments of LIS-1 were found present in their genome.
- Arabidopsis thaliana* and flax have processes for destabilizing an intact LIS-1 element. The "target site" is created in all transgenic plants transformed with only LIS-1.



Figure 8. Steps from the different treated branches were collected and analyzed without antibiotic selection. Instead, (T) flax were selected using direct PCR testing from leaves DNA. PCR primers designed across the primers pairs above the insertion sequences.

Future Direction for the project

Investigate on the possible mechanisms behind "exogenous" LIS-1 destabilization from the genome, why some sub-fragments of LIS-1 were more stable than others in the genome; "posterior" role of small RNAs in this process?

References

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High Transformation Rate of Flax (*Linum usitatissimum*) using *Agrobacterium* and Floral Dip Method

Nasmah Bastaki, Ph.D., Morgan MacBeth,

Jennifer Piechowski and Christopher Cullis, Ph.D.



Introduction

- Previously, transformation in flax has required a long wounding and regeneration process prone to being accompanied by many mutational events and low transformation rates.
- *Agrobacterium*-mediated plant transformation via floral-dipping is routinely used for many plants such as *Arabidopsis*, tomato, and maize.
- Flax transformation by using *Agrobacterium* and floral dip has not previously been reported.

Methods

- In this study, two different flax varieties, *Stormont cirrus* (PL) and *Bethune*, were treated with *Agrobacterium* harboring a plant binary vector+LIS1 using the floral dip method.
- A total of 137 progenies (T1) from PL and 103 progenies from Bethune were tested by regular and direct PCR from leaf DNA, using primers designed to amplify regions expected to be transferred from the vector.



Figure 1: Examples of the parent (T0) plants of PL and Bethune that were used for the floral-dipping. Pre- and post-treatment

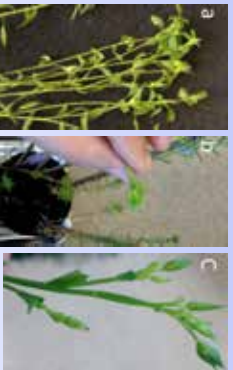


Figure 2: Cutting the leaves around the primary inflorescence bolts to expose them to the *Agrobacterium* cells



Figure 3: The different bolt stages that were used in this protocol to determine the best stage to use for the floral dip

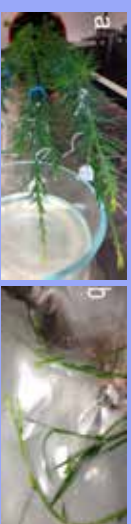


Figure 4: The process of flax floral-dipping

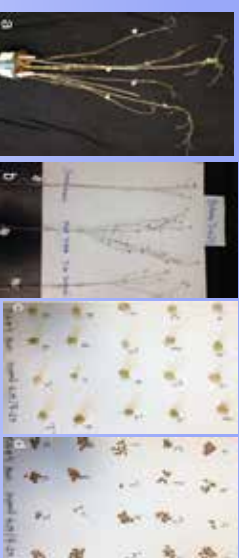


Figure 5: The process of flower tracking and seed collections



Figure 6: Antibiotic escape, a problem for T1 selection, is overcome by direct PCR screening

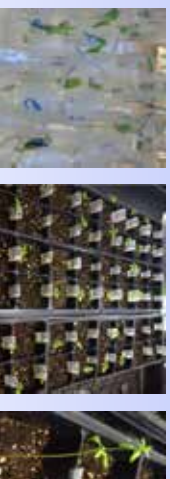


Figure 7: The T1 seedlings are grown without antibiotic selection



Figure 8: Direct PCR amplifications from transgenic leaves DNA showing stable transformations of the transgene

Results

a) Breakdown of positive transformants of main and side branches from each T1 plant of PL

#T0 Inbred parent	#T1 Plants screened from Main branch	#T1 Positive transformants obtained from Main branch	#T1 Plants screened from Side branches	#T1 Positive transformants obtained from Side branches	Total #T1 positive transformants
#1	9	6	11	2	8
#2	9	2	4	1	3
#3	6	5	6	6	11
#4	17	11	6	5	16
#5	10	6	6	6	6
#6	6	5	-	-	5
#7	6	4	-	-	4
#8	11	6	-	-	6
#9	9	1	7	3	4
#10	12	6	4	0	6
Totals	99	52	28	17	69

b) Overall transformation rate of PL

Total number of T1 Plants screened	Total number of positive transformants obtained	Overall Transformation Rate of PL
137	69	50.36%

a) Breakdown of positive transformants of main and side branches from each T1 plant (Results are not shown here)

b) Overall transformation rate of Bethune

Total number of T1 Plants screened	Total number of positive transformants obtained	Overall Transformation Rate of Bethune
103	14	13.6%

Conclusions

- The overall transformation rate of flax using *Agrobacterium* and floral-dipping was surprisingly high at 50.36% for PL and 13.6% for Bethune. This is the highest, which has been reported so far, for flax transformation and for many other plant species using similar methods.

- Transformation was stable during vegetative growth (over the period of 8-9 months), and it was stably inherited to the next generations (T2, T3), results not shown.

- ****The floral dip is an applicable and efficient method for genetic alteration of flax genome and could be used to replace current methods of flax transformation.**

Reference

Nasmah Bastaki and Christopher Cullis. Floral-dip Transformation of Flax (*Linum usitatissimum*) to generate transgenic progenies with high transformation rate. *The Journal of Visualized Experiments*, 2014



Assessment of Eukaryotic Phytoplankton Diversity in Kuwait Coastal Waters using Molecular Techniques

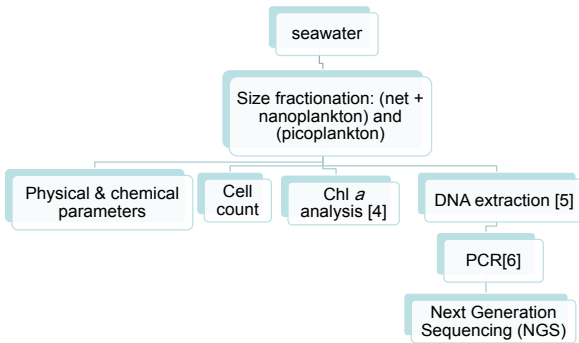


Hanan S. Al-Adilah
Kuwait University / department of biological science

Introduction

Phytoplankton are grouped according to size into net- and nanophytoplankton (>20 -3 μm), which are composed mostly of diatoms and dinoflagellates [1, 2], and picophytoplankton (2-0.2μm), which are probably the most abundant eukaryotes on earth [3]. Subiyah is a semi-enclosed body of seawater, and is affected by the estuary at the northernmost extremity of the Arabian Gulf. This study aims to compare the biomass of the net-,nanophytoplankton to that of the picophytoplankton in Subiyah during the hot season (August). And, to determine the diversity of each size fraction using culture independent techniques.

Methods



Results

Chlorophyll *a* analysis

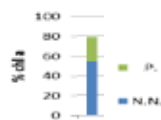


Fig. 1. The percentage of chl *a* contribution of net- and nanoplankton (N.N) fraction compared to that of picoplankton (P) fraction in seawater collected from Subiyah. Measurements were carried out using a fluorometer.

cell count

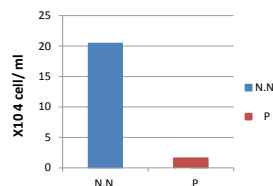


Fig. 2. Cell count of net and nanoplankton (N. N.) (using haemocytometer) and of the picoplankton (P) (using epifluorescent microscopy).

Proportion of Photosynthetic to non-photosynthetic eukaryotic plankton.

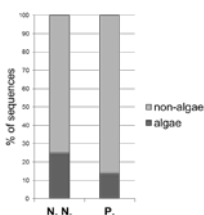


Fig. 3. The percentage of photosynthetic to non photosynthetic eukaryotic plankton affiliates in DNA extracts of size fractionated Subiyah seawater. net- and nanoeukaryotic (N. N.) and picoeukaryotic (P) plankton.

Parameter	Value
Ph	8.19
D.O (mg/L)	5.87
Temp. (°C)	31.9
Turbidity (NTU)	8
Conductivity (mS/cm)	43.23333
Salinity (%)	3.77
Chemical Parameters	
Dissolved Silicate(mg/l)	6.247467
Ammonium (μg/l)	43
Nitrite (μg/l)	315.3918
Nitrate(μg/l)	2346.567
Inorganic Phosphate(μg/l)	275

Table 1. The physical and chemical characteristics of Subiyah coastal seawater during August 2011.

NGS analysis of DNA samples

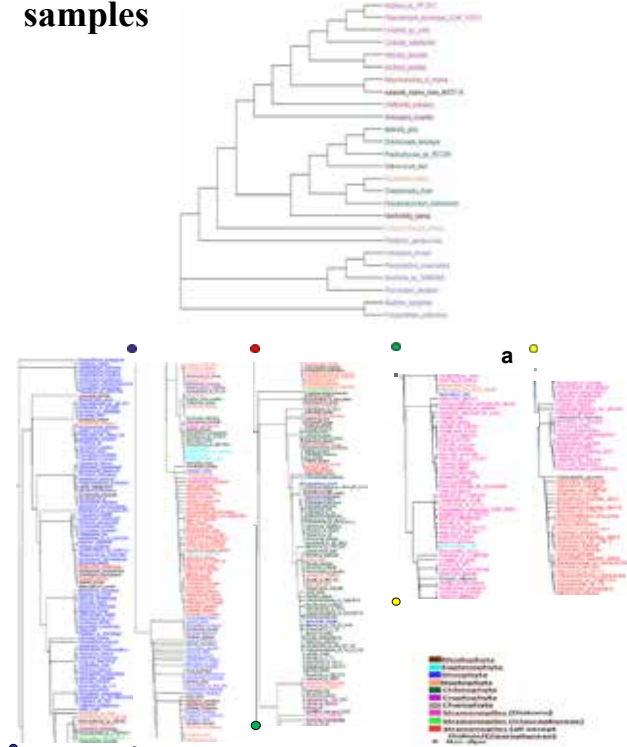


Fig. 4. A phylogenetic tree showing the closest match to the different algal OTUs generated by NGS for DNA extracted from picoplankton (a) and net and nanophytoplankton size-fractionated seawater sample. A threshold of 98% sequence similarity was used. Different colors represent different classes and phyla.

Conclusions

The eukaryotic phytoplankton in the nutrient rich coastal water of Subiyah were dominated by the net and nanophytoplankton (>3μm), in term of abundance (cell count and Chl *a* concentration) and diversity. The tiny cells of picophytoplankton compete better with larger phytoplankton under low nutrient concentration due to their high surface area to volume but are outcompeted under high nutrients conditions [7] such as in Subiyah.

The diversity of the heterotrophic plankton was much higher than that of autotrophs, especially in the picoeukaryotic plankton size . These heterotrophs are expected to exert a grazing pressure on the phytoplankton.

With regard to the species composition of the net and nanoplankton, diversity was dominated by *stramenopiles*, especially diatoms and dinoflagellates. There were affiliates with well known harmful algal bloom (HAB) forming species such as *Pseudochattonella verruculosa*, *Chattonella subsalsas*, *Heterosigma akashiwo*, *Gonyaulax spinifera*, *Amphidinium carterae*, *Prorocentrum concavum* and *Prorocentrum emarginatum*.

With regard to the picoplankton species composition, diversity include affiliates of *Geminigera cryophila* and the smallest eukaryotic organism; *Ostreococcus tauri*[8].

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Protection of Al97Mg3 Alloy against Corrosion in NaCl Containing Solutions Using Silane and Silane-Graphene Films

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The corrosion protection of surface treated Al97Mg3 alloy in 3.5% NaCl containing aqueous electrolytes using films of 1,2-bis(triethoxysilyl)ethane and silane-graphene hybrids is studied. The electrochemical behavior of the alloy was studied using potentiodynamic polarization, electrochemical impedance spectroscopy (EIS) and the surface structure was investigated using scanning electron microscopy and energy-dispersive X-ray spectroscopy and X-ray photoelectron spectroscopy techniques. The surface coating was administered to the alloy by immersion of the chemically pretreated surface. A highly cross-linked film was developed of the silane film and the hydrated aluminium oxide layer. Effect of immersion time in silane showed that optimum protection efficiency was achieved after 30 minutes. The silane film showed a high protection namely against pitting development. SEM images proved that pits develop only over unprotected surfaces. EIS data showed high protection efficiencies up to 168 hours of immersion in the chloride-containing solution. Graphene oxide was mixed with the silane solution with different ratios. The efficiency of protection increased in presence of graphene structures as the hydrophobicity of the surface increases. The surface was characterized using surface enhanced Raman spectroscopy (SERS).

Objectives

The aim of this work is to deposit films of 1,2-bis(triethoxysilyl)ethane films over Al97Mg3 substrate surface by means of simple immersion technique. The effect of immersion time in silane and 3.5% NaCl and temperature on Al97Mg3 substrate is investigated. The corrosion protection performances of silane films are studied by potentiodynamic polarization, electrochemical impedance spectroscopy (EIS), scanning electron microscopy and energy-dispersive X-ray spectroscopy techniques.

Results

1- The effect of immersion time in silane on the electrochemical behavior of Al97Mg3

1.1. DC potentiodynamic polarization test

Figure 1 shows the anodic and cathodic polarization behavior of Al97Mg3 alloy in 3.5% NaCl. The alloy was covered by a silane protective layer with different thicknesses. In the cathodic part, Al alloy showed concentration polarization by dissolved oxygen reduction reaction and active polarization region by hydrogen gas generation as the potential was scanned to the positive active direction. The corrosion potential values (E_{cor}) range from -1.383 V (for the alloy coated with immersion time of 30 min) to -1.617 V (for the bare alloy) vs. Ag/AgCl. The current density at relatively negative potentials showed a short rise within a potential interval of 30 mV. A cathodic protection takes place at this region for the bare and silane-covered alloy.

Aluminum is attacked by strong alkaline species produced at the cathode side when magnesium corrodes in sodium chloride solution through a sacrificial process. Al97Mg3 alloy will corrode with a relatively higher rate compared to aluminum.

In sodium chloride-containing electrolytes, however, the cathodic corrosion of aluminum is much more pronounced. This is due to the fact that sea water containing magnesium ions reduces the equilibrium pH from 10.5 to around 8.9. At this stage the two elements in the alloy, aluminum and magnesium, became compatible in terms of corrosion potentials and the iron content will become less influential on the corrosion

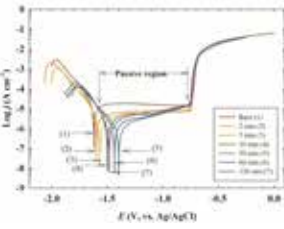


Fig. 1. Potentiodynamic polarization curves for the corrosion of Al97Mg3 in 3.5% NaCl after different times of immersion in silane at 25°C. Scan rate 10 mV/s⁻¹.

The equilibrium corrosion potential values shifted towards more positive values as the immersion time in silane solution increases up to 30 minutes. This is due to the protection ability of the silane layer formed over the surface of the alloy and the thin layer of oxide "pre-formed" over the surface of the alloy. Aluminum oxide has an amphoteric character, and the standard potentials are given in reactions (1) and (2):
 $Al^{3+} + 3e^- \rightarrow Al$ (-1.66 V, acidic) (1)
 $H_2AlO_3 + H_2O + 3e^- \rightarrow Al + 4OH^-$ (-2.35 V, alkaline) (2)
 The half-reaction given in (2) shows similar value to that of the dissolution of magnesium according to:
 $Mg^{2+} + 2e^- \rightarrow Mg$ (-2.37 V, acidic) (3)

The increase in the pH of the electrolyte in contact with aluminum results in a galvanic current flow between the magnesium and the initially passive aluminum in the alloy. In chloride-containing electrolytes, aluminum dissolution is followed by two other possible chemical reactions:

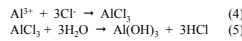


Table 1 summarizes the electrochemical corrosion parameters for bare and silane-coated alloys with immersion time of 30 minutes.

Time, min	I_{corr} , mA/cm ²	E_{corr} , V	β_a , mV/decade	β_c , mV/decade	R_p , Ω cm ²	Corrosion rate, mpy	PE %
Bare	2.42	-1.62	269	80.8	0.998	—	—
7	0.865	-1.60	366	89.6	0.358	64.2	—
5	0.433	-1.57	291	87.0	0.179	82.1	—
10	0.405	-1.50	232	172	0.167	83.2	—
30	0.270	-1.38	256	125	0.111	88.7	—
60	0.347	-1.45	353	98.9	0.143	85.8	—
120	0.313	-1.48	225	80.8	0.130	87.0	—

1.2. Electrochemical impedance spectroscopy

The Nyquist and Bode plots comparing the data of bare alloy and silane-coated surfaces (with different immersion times that reflects different silane coating thicknesses) in 3.5% NaCl are presented in Figures 2 and 3, respectively. The corresponding equivalent circuits used for data fitting of the experimental data are given in Figure 4. In the first circuit, the different components are defined as follows: R_s is the electrolyte resistance, R_{ct} is the charge transfer resistance, C_{dl} is the double layer capacitance, R_2 is the oxide layer resistance and Y_0 is a constant phase element representing the roughness of the layer.

The Nyquist plots of Figure 2 display ill-defined and incomplete semi-circles that reflect the detected passive behavior of the oxide layer formed of aluminum oxide at the interface. The magnitude of the impedance increases through all frequency ranges studied as the film coverage thickness increases. The Bode plots data of Figure 3 show two time constants reflecting the components of the equivalent circuit of Figure 4. The impedance for a simple Randles circuit that constitutes one of the time constants of the circuits depicted in Figure 4 is given by:

$$Z = R_s + \frac{R_{ct}}{1 + (\omega R_{ct} C_{dl})^2} - j \frac{\omega R_{ct}^2 C_{dl}}{1 + (\omega R_{ct} C_{dl})^2}$$

$$Z_{CPE} = \frac{1}{Q_{CPE} (j2\pi f)^\alpha}$$

$$Z_{CPE} = Z_0 \omega^\alpha \left\{ \cos\left(n \frac{\pi}{2}\right) + j \sin\left(n \frac{\pi}{2}\right) \right\}$$

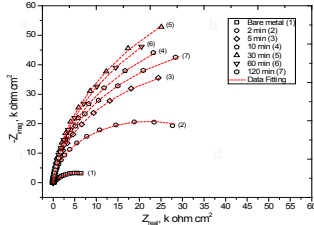


Fig. 2. Nyquist plots recorded for the corrosion of Al97Mg3 in 3.5% NaCl after different time of immersion in silane at 25°C (versus open circuit potential). Frequency limits (0.01 Hz - 100 kHz), $E_{ref} = 0$ mV.

For a non-ideal capacitance, the coefficient (α) is less than 1. The slope of the log Z'/log f of the Bode plot shows a slope less than -1 for the bare surface and closer to the value of -0.9 for the silane-coated alloy. The largest values of the phase shift are observed for the silane-coated surfaces compared to the bare alloy in the mid-range of frequency. This is indicative of the relatively high corrosion resistance for the coated samples.

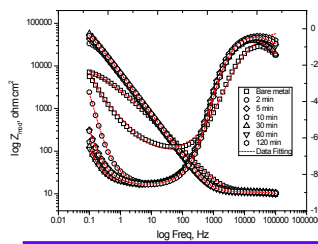


Fig. 3. Bode plots recorded for the corrosion of Al97Mg3 in 3.5% NaCl after different time of immersion in silane at 25°C.

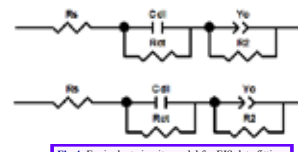


Fig. 4. Equivalent circuits model for EIS data fitting.

From the data of Table 2 the values of the charge transfer resistance increase as the time of immersion in the silane increases. The highest resistance to the charge transfer was observed for the silane-layer obtained after immersion for 30 minutes. A close to perfect capacitance is noticed from the values of Y_0 and α parameters of the silane-coated alloy. Thus, the silane layer acted as a barrier to the electrolyte with nearly stable value upon changing its thickness. An important feature is the pore resistance of the silane layer that did not change appreciably with time of immersion.

Immersion time	R_s , Ω cm ²	C_{dl} , μF cm ²	R_{ct} , Ω cm ²	Y_0 , μF cm ²	α	R_p , Ω cm ²	Z' , Ω cm ²	Z'' , Ω cm ²	PE %
Bare metal	9.8	202	3640	77.8	0.76	5.16	0.0044	0.51	—
7 min	8.43	0.697	2.57	25.7	0.96	44.2	0.0005	0.055	88.3
5 min	6.56	0.252	4.80	29.2	0.96	84.3	0.0002	0.023	93.9
10 min	9.12	0.448	2.46	26.9	0.96	121.0	0.0001	0.017	95.7
30 min	6.96	0.241	5.02	23.9	0.96	159.0	0.0003	0.031	96.8
60 min	7.18	0.285	3.49	27.7	0.96	147.0	0.0002	0.017	96.5
120 min	8.12	0.363	3.01	24.6	0.96	101.0	0.0002	0.021	94.9

Table 2. The electrochemical parameters calculated EIS technique for the corrosion of bare Al97Mg3 in 3.5% NaCl after different time of immersion in silane at 25°C.

2. The effect of exposure time of Al97Mg3 in 3.5% NaCl

The Bode plot in Figure 6 shows that the coating maintained its barrier-like protection performance through the first day of exposure to the NaCl solution. Inspection of Table 3 reveals that the charge transfer resistance, R_{ct} , progressively decreased through the 7 days of the test. The values of the constant phase element, Y_0 , and the pore resistance, R_p , ultimately remained constant throughout the first day. It is important to mention that the film stability was exceptional as its integrity and adhesion to the alloy surface was rather exceptional. Again, the pitting of the surface was not observed after such a long time of exposure. The charge transfer resistance reached a relatively low value by the end of day seven of exposure. However, as the pore resistance decreases it is expected that the ionic conduction within the film layer increases. This should result in the facilitation of the charge transport. The relative increase in the double layer capacitance ascertained this conclusion.

For the bare alloy exposed to NaCl solution for extended time as shown in Figure 5, the values of the absolute impedance start to increase indicating the formation of the aluminum oxide layer up to 2 hours of exposure. After this time period, the impedance value decreases steadily indicating the breakdown of the aluminum oxide protective layer and the formation of the pits.

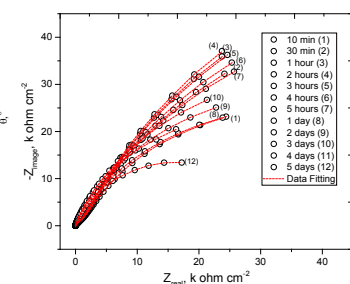


Fig. 5. Nyquist plots recorded for the corrosion of Al97Mg3 in 3.5% NaCl after different time of immersion in silane at 25°C.

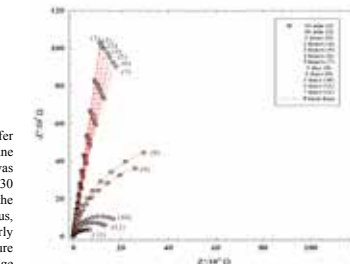


Fig. 6. Nyquist plots recorded for the corrosion of Al97Mg3 in 3.5% NaCl after different time of immersion in silane at 25°C.

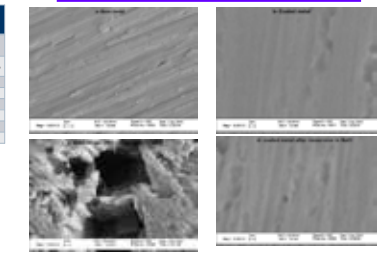


Fig. 7. SEM micrographs of Al97Mg3 surface (a, b) bare and silane coated Al97Mg3 before of immersion in 3.5% NaCl, (c) bare Al97Mg3 after 24 h of immersion in 3.5% NaCl, (d) unsaturated silane coated Al97Mg3 after 24 h of immersion in 3.5% NaCl at 25°C.

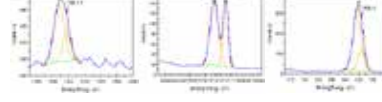


Fig. 8. Chemical shift for Mg and Al of the alloy before exposure to NaCl.

Conclusion

Silane coating has proved to be an effective approach to the formation of a barrier layer to substitute for hazardous chromium. PE was as high as 98.6% for silane film. Polarization and EIS data proved that the silane-protecting film is stable and allows the formation of an aluminum oxide protective layer underlying beneath the silane film. SEM images proved that the film completely protect the surface of the alloy from pitting attack up to seven days of exposure. XPS measurements proved again that the main composition of the protective film is in the form of a cross-linked silane network preceded by an aluminum oxide.

Acknowledgment

The financial support of the University of Kuwait through the fund provided through grant number SC02/13, instrumentation facilities through grants GS01/01, GS02/08, and Department of Chemistry instrumentation facilities is highly appreciated.



How do α -pyridoin benzylhydrazide ligands act differently?

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Abstract

This research shows that [α -Py-BHZ] can act as bidentate and tridentate ligands depending on the kind of the metal ion. With ruthenium (II) it acts as a bidentate ligand and with cobalt (III) it acts as a tridentate ligand. These results can be explained in terms of metal size. α -pyridoin-benzylhydrazide ligand is able to substitute bipyridine ligand in the case of cobalt (III) and not in the case of ruthenium (II).

Introduction

α -pyridoin-benzylhydrazide [α -Py-BHZ] are powerful pharmaceutical agents. The coordination of transition metal ions to these compounds alter their properties and reactivity. The α -pyridoin segment of these compounds has antioxidant¹⁻² and antimicrobial³ properties and the benzylhydrazide segment has antituberculosis⁴⁻⁵ reactivity. The presence of metal ions are believed to alter the chemical, physical and biological properties of these compounds. Investigating these compounds provide tools in the design of potential drugs.

Objectives

- 1- To synthesize and characterize α -pyridoin-benzylhydrazide derivatives.
- 2- To study the coordination of transition metal ions to α -pyridoin-benzylhydrazide derivatives.

Methods

An equimolar of α -pyridoin and benzylhydrazide derivatives was allowed to react in alcohol/acidic media under reflux condition. Monomer and dimer products were isolated and purified. Monomer compounds only reacted with ruthenium (II) and cobalt (III) parent compounds in the form of [M (bpy)₂Cl₂]. The metal complexes were isolated as a PF₆ salt. Figure 1 shows the chemical reaction for the synthesis of α -pyridoin-benzylhydrazide derivatives and its metal complexes.

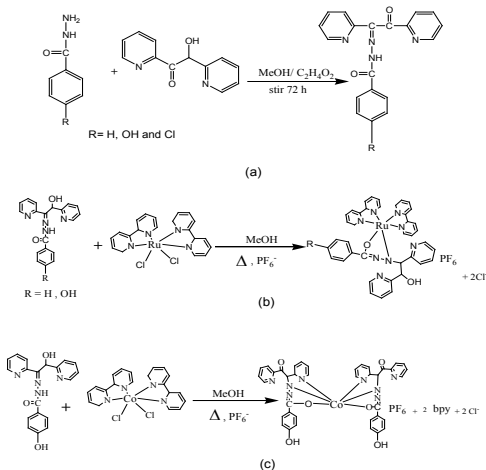


Figure 1 Synthesis reactions for (a) [α -Py-BHZ] derivatives (b) [Ru (bpy)₂ α -Py-BHZ-H] PF₆ and [Ru (bpy)₂ α -Py-BHZ-OH] PF₆ (c) [Co (α -Py-BHZ-OH)₂] PF₆

Results

- The crystal structure of [Ru (bpy)₂ α -Py-BHZ-H] PF₆ complex shows that ruthenium (II) binds to the [α -Py-BHZ-H] ligand through the oxygen and nitrogen atoms of BHZ (Figure 2) and cobalt (III) binds to the pyridine nitrogen of α -pyridoin and to the oxygen and nitrogen atoms of BHZ segment as shown in Figure 3.
- SEM results show that [Ru (bpy)₂ α -Py-BHZ-H] PF₆ complex has a needle shape structure (Figure 4) and [Co (α -Py-BHZ-OH)₂] PF₆ complex has a flower shape structure (Figure 5).
- The data suggests that [Co (α -Py-BHZ-OH)₂] PF₆ exists in resonance structures shown in Figure 6.

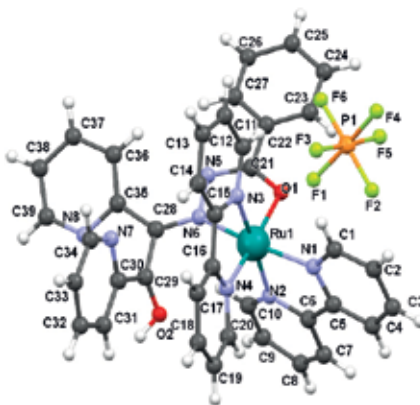


Figure 2 Crystal structure of [Ru (bpy)₂ α -Py-BHZ-H] PF₆

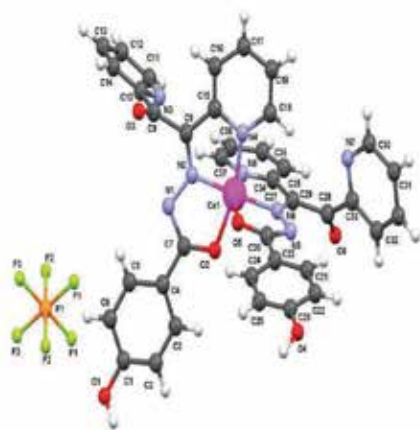


Figure 3 Crystal structure of [Co (α -Py-BHZ-OH)₂] PF₆

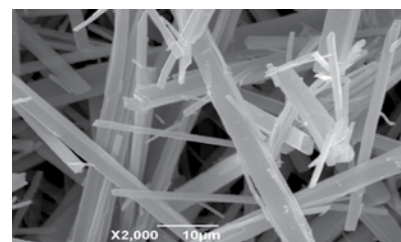


Figure 4 SEM image of [Ru (bpy)₂ α -Py-BHZ-H] PF₆

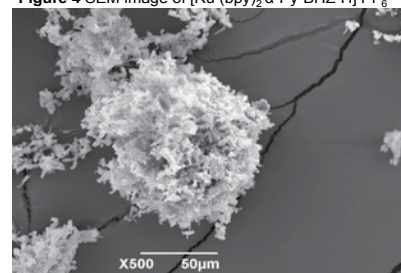


Figure 5 SEM image of [Co (α -Py-BHZ-OH)₂] PF₆

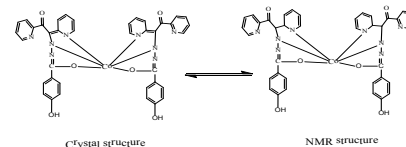


Figure 6 Resonance structure of [Co (α -Py-BHZ-OH)₂] PF₆

Conclusions

- The synthesized α -pyridoin-benzylhydrazide ligands may act as bidentate or tridentate ligands based on the nature of the metal ions.
- The reaction of cobalt (III) parent [Co (bpy)₂Cl₂]¹⁺ with [α -Py-BHZ-OH] ligand results in complete substitution of the bpy ligands.
- Ru (II) is larger in size than Co (III), so it can coordinate to BHZ ligand without substituting the bpy ligands. Size restriction in Co (III) causes ligand substitution, in which the tridentate ligand BHZ is favorable over the bidentate ligand bpy.
- This research supports the foundation of "drug-design" field in Kuwait.

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The Role of Carbon Black-supported Au and Ag Nanoparticles as Electrocatalysts for the Reduction of CO₂ to CO

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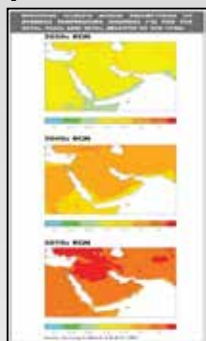
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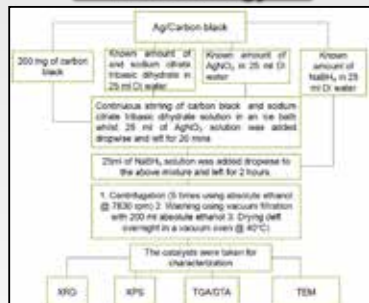
Abstract: In conjunction with carbon sequestration and concentration techniques, the electrochemical reduction of atmospheric carbon dioxide (CO₂) to carbon monoxide (CO) is a highly desired reaction because CO is a key reactant in synthesis gas, which is used to produce value-added products (e.g. diesel via the Fischer-Tropsch reaction) that provide energy/electricity in an environmentally friendly manner. Gold and silver nanoparticles supported on carbon black (Au/CB and Ag/CB, respectively) show promising selectivity and energy efficiency as electrocatalysts as demonstrated by their high faradaic efficiencies and low overpotentials for the reduction of CO₂ to CO. These electrocatalysts were synthesized in a one-pot process where the vigorous mixing and timely addition of reactants produced homogenous particle size distributions. The transmission electron microscopy (TEM) images of synthesized composite materials show smaller average diameters of Au nanoparticles compared to Ag nanoparticles. The monodispersed Au/CB electrocatalysts showed superior results, higher faradaic efficiencies towards CO, compared to Ag/CB electrocatalysts with comparable metal loadings and particle sizes. Furthermore, the gold nanoparticles supported on carbon black exhibited enhanced stability of the intermediate phase, which is widely believed to be a COOH species, indicated by the reduction of the overpotential compared to silver nanoparticles deposited on carbon black.

Introduction

The rise in atmospheric carbon dioxide (CO₂) levels must be halted to avoid further undesirable climate change [1]. As one of the founding members of OPEC, the CO₂ emissions from the production of crude oil was recorded as 27,466 metric tons in 2010 [2]. To combat such hazardous pollutants, the reduction of CO₂ emissions from oil refineries, industrial factories and other sources was put into action due to laws enforced by Kuwait EPA and other governmental and private collaborators. The major concern of this work is the electrochemical CO₂ reduction to value-added chemicals, such as carbon monoxide (CO), which provides a means to storing otherwise wasted excess renewable energy from intermittent sources. A key challenge hampering the economical viability of CO₂ transformations is the lack of efficient, selective, and durable electro-catalysts to drive the desired reactions [3, 4]. So, the ultimate goal of this project is to accelerate the development of high-performance electro-catalysts for commercially viable CO₂ reduction to a value-added product, carbon monoxide (CO). Due to its extraordinary physical and electronic properties, different weight percentages of silver, Ag, or gold, Au, were deposited on carbon black and its catalyst activity and selectivity for CO₂ reduction to CO were tested [5].



Methodology



Au on carbon black, catalysts were prepared in the same manner. These catalysts were prepared at a constant 2.75:1 molar ratio (sodium citrate tribasic dihydrate: noble metal precursor) and 1.35:1 molar ratio (sodium borohydride: noble metal precursor). Sodium borohydride, sodium citrate tribasic dihydrate, silver nitrate and gold (III) chloride trihydrate were used as a strong reducing agent, mild reducing agent and noble metal precursors, respectively. These chemicals were bought from Sigma Aldrich and used without modification. Ag-30, Ag-50 and Ag-60 are assigned to 30, 50 and 60 wt% Ag on carbon black, respectively. Au-5, Au-15, Au-30, Au-50 and Au-60 are assigned to 5, 15, 30, 50 and 60wt% Au on carbon black, respectively. Carbon black is abbreviated as CB.

Results and Discussion

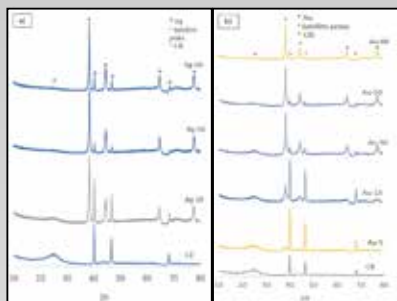


Figure 1. XRD peaks of a) CB, Ag-30, Ag-50 and Ag-60 b) CB, Au-5, Au-15, Au-30, Au-50 and Au-60.

Table 1. Crystallite sizes of CB, Ag-30, Ag-50, Ag-60 and Au-5, Au-15, Au-30, Au-50 and Au-60.

	Ag-30	Ag-50	Ag-60	Au-5	Au-15	Au-30	Au-50	Au-60
Au (nm)	-	-	-	6.85	6.12	5.27	5.32	5.66
Ag (nm)	7.73	6.65	7.78	-	-	-	-	-

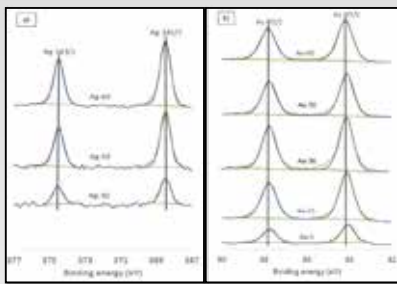


Figure 2. XPS results showing oxidation states of a) Ag and b) Au at different loadings.

Table 2. C1s and O1s binding energies (in eV) of pure and doped CB.

Bond	C1s		O1s	
	C-C	C-O	-C=O	C-O
CB	284.7	285.3	532.5	534.1
Ag-30	284.6	285.3	532.6	533.9
Ag-50	284.6	285.4	532.1	533.5
Ag-60	284.6	285.3	532.3	533.7
Au-5	284.6	285.4	532.4	533.8
Au-15	284.6	285.3	532.4	533.6
Au-30	284.5	285.2	531.9	533.2
Au-50	284.6	285.2	532.6	533.9
Au-60	284.7	285.2	532.3	533.6

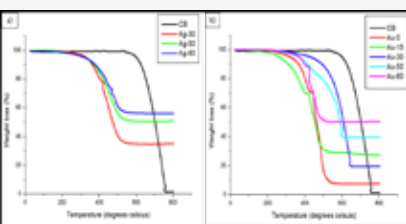


Figure 3. Thermogravimetric analysis of the studied samples.

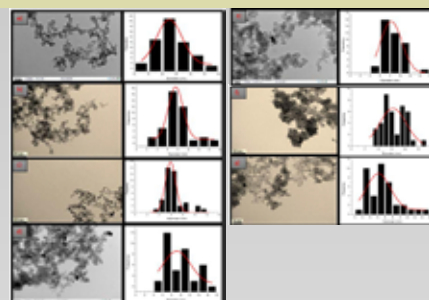


Figure 4. TEM and particle size distribution of (CB, Ag or Au) nanoparticles a) Au-5 b) Au-15 c) Au-30 d) Au-50 e) Au-60 f) Ag-30 g) Ag-50

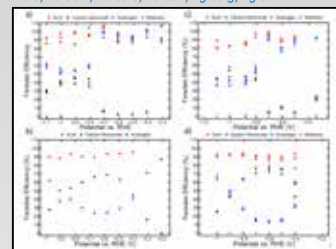


Figure 5. Electrochemical characterization of CO₂ of a) Ag-50 b) Au-30 and c) Au-60 (performed at MIT lab).

Conclusion

> In general, as the Au metal loadings increase, the crystallite sizes of Au decreases. An optimum Au metal loading (Au-30) provided the smallest crystallite size of gold (~5.3 nm). For Ag, the trend was different with Ag-50 which contained the smallest crystallite size of Ag (~6.7 nm).

> According to TGA, all electro-catalysts have a lower onset temperature compared to CB. As the Ag metal loading increases, the onset temperature for decomposition of carbon network decreases. For the higher Au metal loadings (Au-30, Au-50 and Au-60), the percentage of final weight loss is increased by 10% compared to CB. For the highest Ag metal loading (Ag-60), the percentage of final weight loss is increased by 3% compared to CB.

> All Au-containing electrocatalysts have a well-dispersed Au nanoparticles with a narrower size distribution compared to Ag-containing electrocatalysts.

> The synthesized Au/CB nanoparticles resulted in a higher activity and selectivity towards the target product (CO) than the Ag/CB nanoparticles. For the Au/CB nanoparticles, an inverse parabolic trend is observed when the CO faradaic efficiency is plotted against the cathodic potential. The pinnacle of this curve occurs at -0.61V vs RHE and results in a CO faradaic efficiency approaching 80%.

> In the future, work will also start on the development of other hetero-structures containing a support which has higher surface area/pore volume compared to CB (e.g. Au/Ketjen black and Ag/Ketjen black). It is hypothesized that these materials will improve the mass transport process and reduce the interfacial charge transfer resistance hence, increase the faradaic efficiency of reduction of CO₂ to CO with higher selectivity of CO at lower overpotential.

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Nanoadditives Effects on Physical and Mechanical Properties of Cement

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Abstract: Several reporters have proved that adding synthesized nano-silica to the cement provides a substantial enhancement to the pore structure of hardened cement. The focus will be given to novel SiO₂ synthesis strategy and also to the porosity and the water structure inside the paste. For the first time here at Kuwait University, ²⁹Si MAS NMR, FTIR, and X-Ray Photoelectron Spectroscopy (XPS) are employed complementarily to identify the hydration phases enabling us to observe the influence of nano admixtures on the microstructure of cement. Water vapor adsorption was applied as a probe for porosity and microstructural features. It is hoped that such additives will enhance the mechanical properties and the durability of the cements paste. The cement-nano-SiO₂ microstructure and surface/bulk properties were examined using aforementioned techniques as described in the poster.

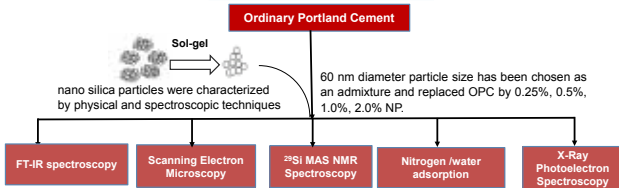
Introduction

It is well known that the State of Kuwait has a very aggressive environment in term of both temperature and medium. Because of that it is demanded to design a high-performance construction materials that can withstand such conditions. It was found that adding synthesized nano-silica to the cement provides a substantially enhancement to the pore structure of hardened cement. Such addition was found also to cause a clear change to the cement phase composition. Increased pozzolanic activity is expected upon the addition of such high surface area nano-SiO₂. The obtained results also prove that nano-SiO₂ are acting as good pore fillers and superplasticizers.

Objective

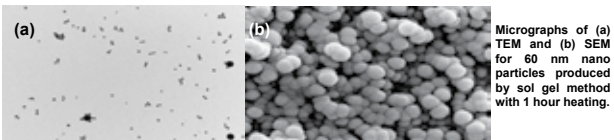
The aim of this work is to investigate the structural modifications associated with the incorporation of nano-SiO₂, prepared by sol gel method, to Ordinary Portland Cement (OPC) and experimentally deduce the optimal amount that should be employed.

Methodology

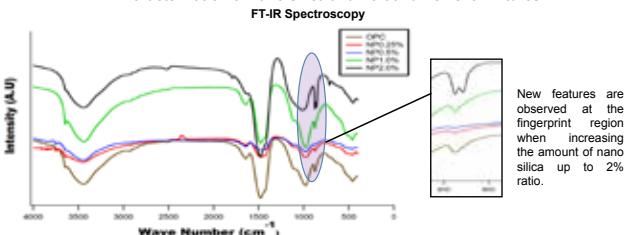


Results

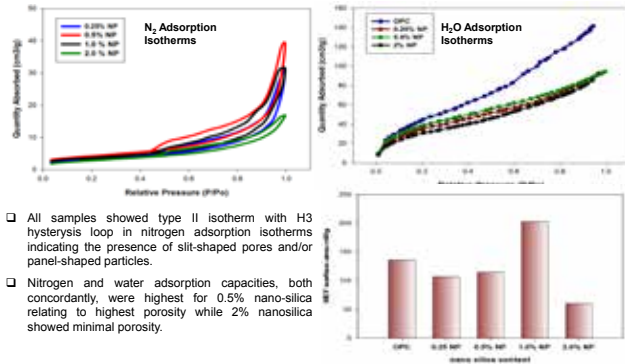
Characterization of nano silica



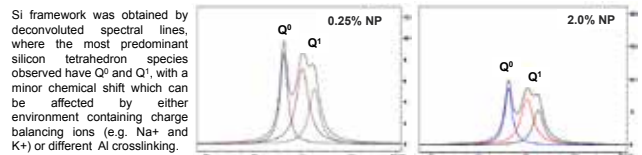
Characterization of nano-silica and Portland Cement mixtures



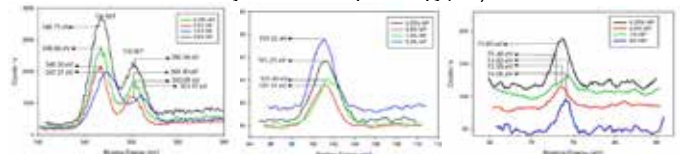
Brunauer–Emmett–Teller (BET) Adsorption/Desorption Analyses



Nuclear Magnetic Resonance ²⁹Si MAS NMR



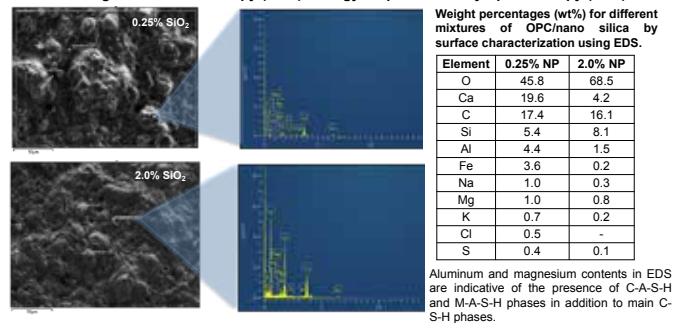
X-ray Photoelectron Spectroscopy (XPS)



Binding Energies for Ca and Si for different ratios of OPC and nS.

- Calcium deficient phases are mostly found in 1% nano-silica containing mixes which is indicated by high Ca2p binding energy.
- The low Si 2p binding energy in 2% nano-SiO₂ samples (101.02 eV) is indicative of higher calcium content.
- Cummingtonite is present at low concentrations of nano-SiO₂ (0.25% and 0.5% replacements) with binding energies of 73.6 eV for Al 2p, while hornblende was found at 2% nano particles with binding energy of 74.06 eV.

Scanning Electron Microscopy (SEM)/ Energy Dispersive X-Ray Spectroscopy (EDS)



Conclusion

- The lowest particle size obtained for nano-SiO₂ was 60 nm when the sol/gel method involved the heating for 1 hour, which was then used as a substitute to Portland Cement for testing and the TEM micrograph shows that the 60 nm particles are monodisperse.
- FT-IR can be a very useful tool for observing small features appearing when amount of nano-particles have increased.
- Nitrogen/water adsorption technique is an advantageous tool for understanding the porosity structure of cement, where both adsorbates showed lowest porosity for 2%NP-containing mixtures.
- ²⁹Si MAS NMR spectroscopy indicated the presence of Q¹ and Q⁰ species and minor shifts can be implication on the presence of some charge balancing ions.
- Binding energies obtained by XPS enables us to make presumptions on phases present which can be further corroborated by SEM/EDS which is a surface characterization technique.

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Highly Fluorinated Copper Phthalocyanine For Potential Use in Dye-Sensitized Solar Cells (DSCs)

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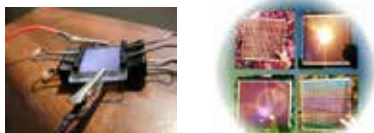
Abstract
Single X-ray diffraction and different spectroscopic analysis determined the highly non-aggregated form of copper phthalocyanine **Cu-Pc(II) 4** substituted with eight peripheral 2,6-bis(trifluoromethyl)phenoxy substituents. The electronic and redox properties of fluorinated complex **4** were investigated to confirm that the HOMO and LUMO energy levels were properly positioned for an effective charge transfer and consequently can be exploited in DSCs devices.

Introduction

Due to the increasing demands of the renewable energy sources instead of fossil fuels, many researches have been devoted to dye-sensitized solar cells (DSCs) as an eco-friendly and low-cost materials. Phthalocyanines (Pcs) have recently received a great attention due to their fascinating optical properties which are currently being exploited in several technological applications [1-3]. Pcs considered as a highly stable organic semiconductors which makes them suitable for solar cells. Most of the **Cu-Pc** exhibit thermal stability and excellent chemical and physical stability, along with the outstanding photo-physical and electrochemical properties [4,5]. Accordingly, highly fluorinated Pc complex in non-aggregated form was prepared for seeking unique physicochemical properties to be exploited in solar cell.

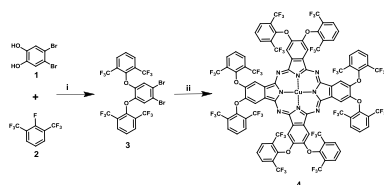
Objectives

A novel peripherally substituted **Pc** with sterically hindered phenoxy substituents, containing 48 Fluorine atoms, was successfully synthesized. Of note, the fluorinated phenoxy substituents has been peripherally introduced into the **Pc** rings in order to maximize their physicochemical properties by heavy atom effect to increase the triplet quantum yield and photo-oxidative stability which makes the prepared complex exhibiting promising photosensitizer for DSCs.



Methods

The target complex **4** was synthesized as outlined in **scheme 1**. 4,5-Dibromobenzene-1,2-diol **1** is subjected to nucleophilic substitution reaction with 2-fluoro-1,3-bis(trifluoromethyl)benzene **2** in dry DMF, catalyzed by anhydrous K_2CO_3 at 120°C, to yield a novel dibromo derivative **3**. The precursor **3** was converted into **Cu-Pc 4** by refluxing in DMF with an excess amount of copper cyanide.



Scheme 1 Synthetic route of peripherally substituted copper phthalocyanine.

Quantum calculations:

DFT studies have been used to calculate the energy minimized structure, electronic distribution, molecular orbitals and electronic absorption spectra for the highly fluorinated **Cu-Pc** complex **4**. The B3LYP functional was chosen with effective core potential LANL2DZ basis sets for copper atom and the standard 6-31G(d,p) basis sets for non-metal elements. All DFT calculations were performed by Gaussian 09 program package.

Based on the optical properties investigation for complex **4**, the HOMO-LUMO gap can efficiently transfer electrons to large band gap semiconductor. The achieved results are in excellent agreement with the obtained electrochemical data, (Fig. 4).

Results

Characterization:

The structural identity of complex **4** was confirmed by different characterization techniques such as MALDI, elemental analysis, NMR, UV-visible spectroscopy and single X-ray diffraction analysis.

The ^{19}F NMR spectra of complex **4** shows one single peak at -59.87 ppm due to the 48 fluorine atoms confirming the highly symmetrical structure of **4** as shown in (Fig.1)

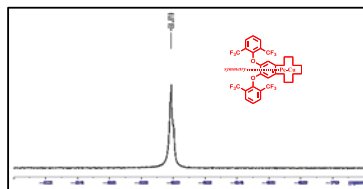


Fig. 1 The ^{19}F NMR spectrum of Cu-Pc

UV-Vis spectrum was used to assess the aggregation behavior in solution based on the position and the shape of the corresponding Q-band. Fig. 1 revealed a single unperturbed sharp peak of Q-band at 667. The shape of the spectra remained constant and their molar extinction coefficients obeyed the Beer-Lambert law in wide range of concentration from 1μ to 10 μM.

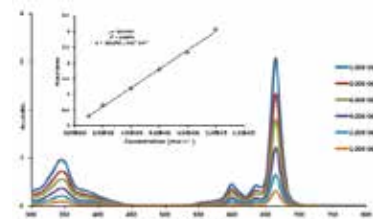


Fig. 2 UV-Vis spectra of complex 4 in THF at different concentrations ranging from 1 to 8 μM, inset: plot of absorbance versus concentration.

Single crystal X-ray diffraction analysis:

Single crystal X-ray analysis of complex **4** was obtained as shown in (Fig. 3). The presence of 48 fluorine atoms were bulky enough to enforce the phenoxy groups to be orthogonally oriented relative to the **Pc** core and therefore inhibit totally the aggregation behavior.

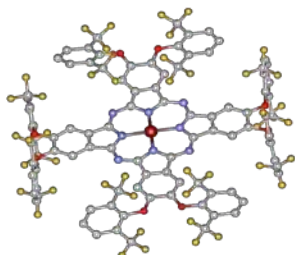


Fig. 3 Molecular structures derived from single crystal X-ray diffraction data of Cu-Pc. Color code: red - oxygen; blue - nitrogen; dark gray - carbon; green - fluorine.

Molecular orbital analysis and cyclic voltammetric data

Voltammetric analysis of fluorinated complex **4**, was carried out in DMF in the presence of TBAPF₆ as supporting electrolyte on a glassy carbon working electrode with (CV) and (SWV) techniques. Voltammogram of complex **4** was analyzed to derive fundamental electrochemical parameters including the half-wave peak potentials ($E_{1/2}$), peak to peak potential separations (ΔE_p), the difference between the first oxidation and reduction processes ($\Delta E_{1/2}$). The results of voltammetric analyses are given in Table 1.

Table 1. Voltammetric data of fluorinated copper phthalocyanine versus SCE

Redox process	$E_{1/2}$ (V)	HOMO (eV)	LUMO (eV)	ΔE_p
$O_1 \rightarrow [Cu^{2+}Pc]/[Cu^{2+}Pc]^{+1}$	0.97	-	-	-
$R_1 \rightarrow [Cu^{2+}Pc]/[Cu^{2+}Pc]^{-1}$	0.65	-4.91	-3.29	1.62
$R_2 \rightarrow [Cu^{2+}Pc]^{-1}/[Cu^{2+}Pc]^{-2}$	1.12	-	-	-

$E_{1/2} = ((E_{pa} + E_{pc})/2)$ were given versus SCE at 0.05 V s⁻¹ scan rate, $\Delta E_{1/2} = E_{1/2}$ (first oxidation) - $E_{1/2}$ (first reduction).

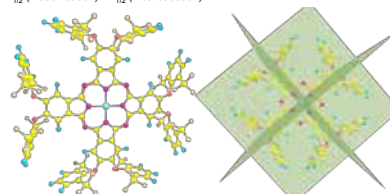


Fig. 4 The optimized structure of Cu-Pc calculated at B3LYP/LANL2DZ, showing that the fluorine atoms enforced the phenoxy groups in highly symmetrized structure D_{4h} to be perpendicularly oriented to the **Pc** core, which is in excellent agreement with the x-ray diffraction analysis.

Based on the spectral studies, the HOMO-LUMO gap of the **Cu-Pc** is in excellent agreement with the CV results as shown in Fig. 4. The CV and SWV responses of **Cu-Pc** gives a ligand based two reversible reduction reactions, R_1 at -0.65 V, R_2 at -1.12 V and one quasireversible oxidation reaction O_1 at 0.97 V within the potential window of DMF/TBAPF₆ electrolyte system. The smaller HOMO-LUMO energy gap obtained for complex **4** represent an important indication for the potentiality of complex **4** being used in the dye sensitized solar cell due to the significant stabilization of the produced anions by the electron-withdrawing fluorinated substituents. In addition, the HOMO level is mainly localized at **Pc** core and the higher orbitals levels were localized over the phenoxy groups and the substituted fluorine.

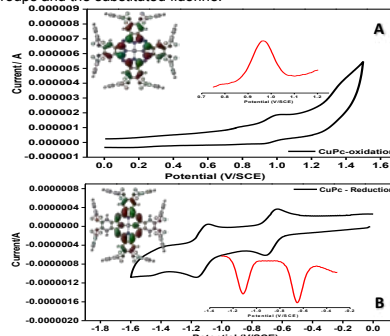


Fig. 5 Cyclic voltammogram of anodic (A) and cathodic (B) parts inset the corresponding SWV of fluorinated Cu-Pc in DMF containing 0.1M tetrabutylammonium hexafluorophosphate, at scan rate 50 mV s⁻¹ and temperature 25 °C.

Conclusion

We have successfully synthesized copper phthalocyanine bearing peripheral bulky phenoxy groups containing fluorine atoms. The spectroscopic characterization results (UV-vis) and X-ray analysis have shown that the aggregation behavior can be greatly inhibited by placing bulky substituents at the preperal positions of **Pc** core. The ground state geometry, HOMO/LUMO energies and the electronic properties were theoretically calculated for complex **4** and corresponded well with the experimental CV and SWV approaches. The solar conversion efficiency of the fluorinated **Cu-Pc** is currently under investigation in our laboratory.

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SEA LEVEL CHANGE IN BUBIYAN ISLAND THROUGH 21 YEARS BY USING REMOTE SENSING AND GIS

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ABSTRACT

This project focuses mainly on the sea level changes in Bubiyan Island in Kuwait using satellite images and ArcGIS. Bubiyan Island, the largest Kuwait island located in northern Kuwait and is separated from the mainland by a narrow channel of Khayr Al-Sabiya. It lies between latitude 29° 35' and 29° 58' N and longitude 48° 07' and 48° 27' E. It has a rectangular shape and is approximately 40 km long and 36 km wide, and its southern coast trends in a NE-SW direction. Satellite images on Bubiyan island shows little change in sea level for the last 21 years, these changes were examined by using satellite data from Landsat (L1) and Landsat5 (L5) collected in September 1994 and 2015. In the image processing step, classification, and change detection in Arc-GIS techniques were used to carry out sea level changes, then by a spatial analysis tools in Arc GIS, a future map were created to predict the sea level change on Bubiyan Island in 2100.

INTRODUCTION

The State of Kuwait, with a population 3,060,000 million. Central Administration of statistics (2011), lies along the northeastern shore of the Arabian Peninsula, bordered in the east by the Arabian Gulf, in the north and west by Iraq, and in the south by Kingdom of Saudi Arabia. It encompasses an area of approximately 17,810 km² extending between latitudes 29° 30' N and 29° 05' N and between longitudes 48° 33' E and 48° 30' E.

Bubiyan Island, the largest Kuwait island located in northern Kuwait and is separated from the mainland by a narrow channel of Khayr Al-Sabiya. It lies between latitude 29° 35' and 29° 58' N and longitude 48° 07' and 48° 27' E. It has a rectangular shape and is approximately 40 km long and 36 km wide and covered an area about 1200 km², and its southern coast trends in a NE-SW direction. Bubiyan Island is bordered by the Mesopotamian delta plain to the north, by the large Shuaib Al-Arab River estuary in the east, by the Dohaiba desert plain of northern Kuwait to the west, and by the open sea area of the Arabian Gulf to the south and southwest. The surface of the island is generally flat and poorly drained, with part of the island composed of volcanic mud and soil, the south and southwest part of the island are composed of marine sediments, shell banks and soft limestone. The sediments texture ranges from silt to clay with blocks sand on the surface. It is very saline and influenced by tidal action. ElBar and AlBarakat, 2000.

Maximum land area of 260 km² in low tide, while the minimum land area is high tide is 40 km². 4 meters are the maximum height of the island above average sea level. Bubiyan Island has the most diverse natural eco system in Kuwait (bubiyanisat.gov.kw)



Figure 1. Location of Bubiyan Island in Kuwait map. (GIS department at KUCI)

Methodology

- Two Landsat images were collected from Landsat5 (L5) in 3-Sep 1994 and Landsat8 (L8) in 28-Aug-2015 by using USGS website
- Remote sensing software (ERDAS) were used first to rectify the co-ordinate system in to UTM, By (Arc-GIS for Desktop) software tools, the study area were selected by polygons (Figure 1).
- The total area that were selected by polygons is 1403.127 Km²
- Composite bands should be used in both L5 and L8 images before starting analysis.
- By Using UNSUPervised CLASSIFICATION from RASTER tool in ERDAS software. 15 classes were be decided manually. Class number 15 were deleted because it was out of the study area for landsat 5. (Table 1)
- Repeat all classification steps in L5 on 2015 Image. (Table 2) and (Figure 3)

- To find the change detection Near infrared band (NIR) should be used, in L5 the (NIR) band is 4 and in L8 is band 5. By adding band 4 (the older image) then band 5 in 2015 image, and composite it. (Figure 4)

Description of area	Land	Water
Number of class	1,2,3,4,5 and 6	7,8,9,10,11,12,13 and 14
Name of class after the merge	1	2
Area in square kilometer	881.07	503.45
Percentage from total area	58.44%	48.58%

Table 1. describe the unsupervised classification classes according to class signature, and area calculation with the total percentage, for Landsat 5 image.

RESULTS



Figure 3. unique map of unsupervised classification on landsat 8

Landsat	Area (km ²)	Aug. (km ²)	Change	Percentage
Land	881.07 km ²	831.05 km ²	-50.02 km ²	-5.6%
Water	503.45 km ²	614.45 km ²	+111 km ²	+22.0%

Table 3. change in Bubiyan Island land-water water in 2 landsat images, 1994 and 2015.



Figure 1. Using Arc-GIS for Desktop software, EDITING tool, to select the study area from the landsat image.

Description of area	Land	Water
Number of class	8,9,11,12,13 and 14	1,2,3,4,5 and 10
Name of class after the merge	2	1
Area in square kilometer	821.65	624.65
Percentage from total area	56.48%	48.58%

Table 2. Describe the unsupervised classification classes according to class signature, and area calculation with the total percentage, for Landsat 8 image.

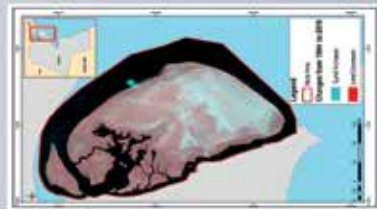


Figure 4. change detection from 1994 to 2015 the red color reflect the decreasing on land while the blue is increase.

CONCLUSION

- According to a mathematical calculation.
- 1- (From year = 2100) to find how many years remain from 2100
- 2- Divide the answer from previous step on the study period of time (2015-1994) to find amount of change per 21 years.
- 3- According to the study 2.6% of land covered due 21 years
- 4- Multiply 2.6 to Answer from No.2 to find percentage of land covered by water in (194-21 = 4197) and 4.647*2.6 = 10.9% of the island will be covered by 2100.

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 - Especially thanks to Kuwait Institute for Scientific Research (KUCI), Dr. Hanih El-Farabi and Ahmed Othman for their technical support.



EVALUATION OF TRACE ELEMENTS ANALYSIS IN STANDARD (Light Sandy Soil) USING ICP-OES TECHNIQUE

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ABSTRACT:

The aim of this poster is to present the validation of Inductively-Coupled Plasma Optical Emission-Spectrometry (ICP-OES) method used for metals determination of International standard BCR-142R (Light Sandy soil) a certified reference material. Microwave digestion was carried out in HNO₃-HCl-HF-H₂O₂ matrix and the ICP values were recorded. This was compared to the standard reference values and approximately 95% accuracy was obtained.

INTRODUCTION:

ICP-AES also referred to as inductively coupled plasma optical emission spectrometry (ICP-OES) is a powerful tool for the determination of metals in a variety of different sample matrices (water, soil, rock, etc). It is a type of emission spectroscopy that uses the plasma to produce excited atoms and ions that emit electromagnetic radiation at wavelengths characteristic of a particular element. With this technique, liquid samples are injected into a radiofrequency (RF)-induced argon plasma using one of a variety of nebulizers or sample introduction techniques. The sample mist reaching the plasma is quickly dried, vaporized and energized through collisional excitation at high temperature. The intensity of this emission is indicative of the concentration of the element within the sample.



MATERIALS AND METHODS:

For the study of ICP-OES, 0.3-0.5g of International standard BCR-142R, Light Sandy soil was weighed. For accuracy of results, Ultrapure water obtained by a Milli Q system was used throughout the analysis. The sample was transferred to a Teflon vessel which was previously cleaned in a water bath of 10% (v/v) nitric solution for 48 h to avoid cross contamination. The extract was attacked with HNO₃-HCl-HF-H₂O₂ matrix in a fume hood. Microwave digestion was then carried out in Mars Xpress digester with a preparation time of 20-30 minutes at 200°C. The vessels were cooled and the mixture was filtered. The filtrate was then made up to 50 ml. To calibrate the instrument, a multi-elemental standard solution of 1000 mg/L containing all analyzed elements (As-Ba-Co-Cr-Cu-Hg-Mn-Ni-Pb-Sc-Zn) was used. Determinations were carried out using the ICP, Horriba Jobin Yvon Ultima-2 equipped with an Ultrasonic Nebulizer and Auto sampler.

RESULTS AND DISCUSSION:

Method validation is an important requirement in the practice of chemical analysis and it is the process of defining an analytical requirement, and confirming that the method under consideration has performance capabilities consistent with the requirement of the application. The estimation of the uncertainty associated with the analytical methods is also necessary in order to establish the comparability of results. The Correlation Coefficients from the obtained and expected values for the procedure are indicated in Table 1. The accuracy of the proposed method was evaluated by analyzing BCR-142R. The results obtained for this digestion method shows good agreement for all elements of the certified values, according to the test for a 95% confidence level, and the method is thus considered accurate. The results obtained reveal that the proposed digestion methods and measurement technique (ICP-OES) can be successfully applied to different kinds of analysis in biological, geological and environmental samples. Cost of analysis/sample is KD 20 for solid samples and KD 15 for liquid samples.

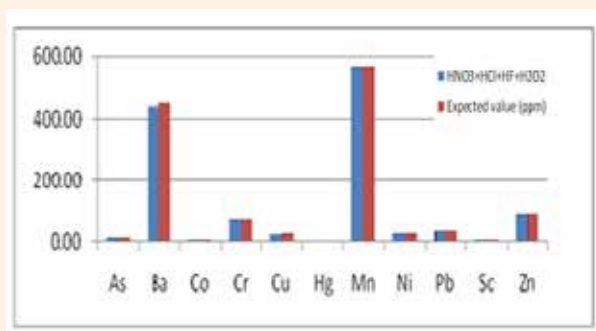
ACKNOWLEDGEMENT:

We would like to thank Department of Earth and Environmental Sciences for the valuable support provided.

Table1: Correlation coefficient & comparison of obtained and expected values

Element	Correlation coefficient	Obtained value(ppm)	Expected value (ppm)
As	0.9996	17.50	18
Ba	0.9991	439.50	450
Co	0.9992	6.20	7.9
Cr	0.9991	72.70	74.9
Cu	0.999	25.50	27.5
Hg	0.9994	0.10	0.104
Mn	0.9993	567.90	569
Ni	0.9993	26.50	29.2
Pb	0.9992	35.60	37.8
Sc	0.9998	7.20	8
Zn	0.9997	91.77	92.4

Figure1: Comparison graph with obtained and expected values



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Geostatistical Analysis of Reservoir Parameters at Drill-Holes & Robust Estimation for the entire Minagish Oil Field, Kuwait

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Abstract

Recently developed Robust Geostatistical Methods are applied to identify and map the Variance Structures of the critical reservoir parameters - porosity, permeability and thickness in the Minagish Oil Field Reservoir. The results demonstrate that (1) The spatial variance structures are effectively defined by the Gaussian Variogram Model for porosity and Spherical Variance Model for horizontal permeability, and (2) Kriging Interpolation and Estimation of these two reservoir parameter values between the drill holes, clearly map the 3D structural geometry of the reservoir parameters. In particular, the Kriging Surface of the Oolite Reservoir clearly defines and maps the north-trending folded structure and north-northeast striking faults. These will aid in future field developmental and production plans that are underway.

Introduction:

The three most important parameters that are critical to Reservoir Quality and Total Resource in an oil field are the nature, amount and spatial continuity of porosity and permeability in the reservoir. Unfortunately, data on these are available only at the few drill-hole locations. So, estimation of the values of these parameters away from the control points for the entire field is inherently difficult task, with high degree of uncertainty in the estimated values. Traditional deterministic methods are too rigid to deal with this complex uncertainty. Recently developed advanced Geostatistical Methods enable mapping of the spatial variance structures of the reservoir characteristics. This will yield more robust estimates of the Total Resource in the oil field (Cao et al. 2014; Habibnia and Momeni 2012; Kamali et al 2013; Liu et al 2015; Malallah 2006; Nazarpour et al 2014; Sacchi et al 2016; Soleimani et al 2015). However, except for a couple of studies, these methods have not been applied on Kuwait reservoirs. In this study, some of these methods are applied, using data from drill holes in Minagish Oil Field in SW part of Kuwait (Figs. 1,2)

Objectives:

- 1) Identify the spatial variance structures of the most Critical Reservoir Parameters - porosity, permeability, etc. from their values at drill-holes.
- 2) Using these structures, estimate these values at all other locations.

Methods:

Variogram Analysis: Semivariance is an autocorrelation statistic defined as:

$$V(h) = \frac{1}{2N(h)} \sum (z_i - z_{i+h})^2$$

where,
 $V(h)$ = semivariance for interval distance h ,
 z_i = measured sample value at point i ,
 z_{i+h} = measured sample value at point $i+h$,
 $N(h)$ = total number of sample-pairs for the lag h .

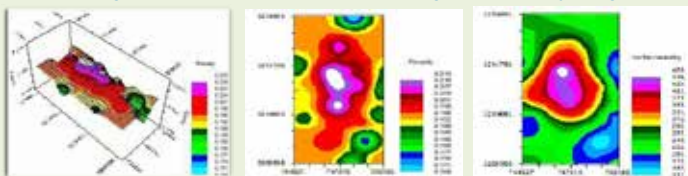
The variogram is a graph of semivariance for separation distance, where autocorrelation is present. This typically yields a curve with Nugget, Sill and Range (Fig.3). There are four types of isotropic variogram models— Linear, Spherical, Exponential and Gaussian. In this study, Gaussian and Spherical Models fitted better.

Kriging Analysis: Kriging is a Geostatistical interpolation method to estimate the values away from the sampled locations, based on the variance structure defined by the Experimental Variogram.

Sensitivity & Validation Analyses: Variograms can be sensitive to outlier values in a data set. These outliers can be identified with plotting Variance Cloud for each lag class, and by plotting h-Scattergram for each lag-class.



1 Minagish Oil Field 2 DH Locations 3 Variogram 4 Porosity Histogram



8 3D-Map Kriging Estimation - porosity 9 2D-Map Kriging Estimation - porosity 10 2D-Map Kriging Estimation - hor permeability



11 Cond. Simulation - porosity 12 Zones in Minagish

Results:

The Gaussian Model (Figs. 4,5,6,7) fits best ($r^2 = 0.712$) to the Experimental Variogram of porosity spatial distribution in Minagish Oolite. Using this model of spatial variance structure, Kriging estimates of all the values in between the drill holes are estimated for the entire Minagish Oil Field; the 3D (Fig. 8) and 2D (Fig. 9) results clearly map the structural geological (domal and fault) control and localization of porosity highs in the Minagish Oolite reservoir. The 2D Kriging map (Fig.10) indicates much broader distribution of horizontal permeability. For comparison, porosity estimation by using Conditional Simulation Method is also shown in Figure 11, which only "catches" the broad regional variation, and local highs are missing.

Conclusion :

Spatial mapping of the most critical reservoir parameters, such as porosity and permeability, must be based on geostatistical methods, which only can provide reliable estimates of the hydrocarbon resources in any oil field.

Further Studies:

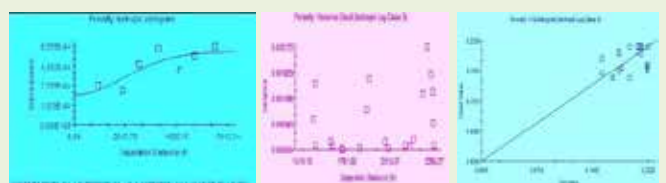
The Oolite Reservoir of Minagish displays sub-zones within it (Fig. 12), and as such, more detailed estimations are progressing at this finer scale.

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Acknowledgements:

Kuwait Oil Company (KOC) provided the drill hole data used in this study and the College of Graduate Studies, Kuwait University provided financial support needed for this study.



5 Gaussian Model - porosity 6 Variance Cloud - porosity 7 h-Scattergram - porosity

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A basic trigonometric power sum and its applications

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Abstract

A basic trigonometric power sum is a finite sum involving positive powers of a cosine or sine whose arguments are rational multiples of π . We provide a new formulas for the basic trigonometric sums

$$\sum_{k=1}^{n-1} \cos^{2m} \left(\frac{qk\pi}{n} \right) \text{ and } \sum_{k=1}^{n-1} \sin^{2m} \left(\frac{qk\pi}{n} \right)$$

where m, n, q are positive integers, with n, q co-primes, into non-trigonometric form combinatorial form.

Several interesting consequences and an application are presented.

Main result

Let m, n, q be positive integers, with n, q co-primes. Then

$$\sum_{k=1}^{n-1} \cos^{2m} \left(\frac{qk\pi}{n} \right) = \begin{cases} 2^{1-2m} n \left(\binom{2m-1}{m-1} + \sum_{p=1}^{\lfloor m/n \rfloor} \binom{2m}{m-pn} \right), & m \geq n \\ 2^{1-2m} n \binom{2m-1}{m-1}, & m < n \end{cases}$$

$$\sum_{k=1}^{n-1} \sin^{2m} \left(\frac{qk\pi}{n} \right) = \begin{cases} 2^{1-2m} n \left(\binom{2m-1}{m-1} + \sum_{p=1}^{\lfloor m/n \rfloor} (-1)^{pn} \binom{2m}{m-pn} \right), & m \geq n \\ 2^{1-2m} n \binom{2m-1}{m-1}, & m < n \end{cases}$$

Consequences

Let m, n be positive integers. Then

$$\sum_{k=0}^{2n-1} (-1)^k \cos^{2m} \left(\frac{k\pi}{2n} \right) = \begin{cases} 2^{2-2m} n \left(\sum_{p=1}^{\lfloor m/n \rfloor} \binom{2m}{m-pn} - \sum_{p=1}^{\lfloor m/2n \rfloor} \binom{2m}{m-2pn} \right), & m \geq 2n \\ 2^{2-2m} n \sum_{p=1}^{\lfloor m/n \rfloor} \binom{2m}{m-pn}, & n \leq m < 2n \\ 0, & m < n \end{cases}$$

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Acknowledgment

This work was supported and funded by Kuwait University Research Grant No. SM03/13.

Counting closed walks

Our main formulas can be used in calculating closed walks on a path and also in a cycle.

We recall that the adjacency matrix A of a graph G is the binary matrix with rows and columns indexed by the vertices of G , such that the (i, j) -entry is equal to 1 if i and j are adjacent, and zero otherwise. Since loops are not allowed in the graphs under consideration, the diagonal entries of G are all zero.

A walk of length r on G represents a sequence along $r + 1$ adjacent vertices (not necessarily different) and hence, possesses r edges. A walk is said to be closed if the first and terminal vertices or endpoints are the same. A circuit is known as a closed walk when it has no repeating edges, while a closed walk with repeating vertices is referred to as a cycle.

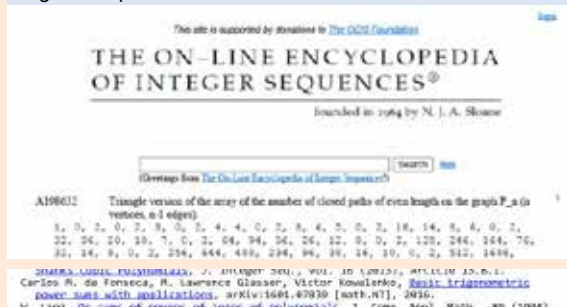
Evaluating the number of closed walks on a graph has been an active topic of research that spans across combinatorics, graph theory, and linear algebra.

Theorem The number of closed walks $p(2m)$ of length $2m$ on a path P_{n-1} is given by

$$p(2m) = \begin{cases} 2n \left(\binom{2m-1}{m-1} + \sum_{p=1}^{\lfloor m/n \rfloor} \binom{2m}{m-pn} \right) - 2^{2m}, & m \geq n \\ 2n \binom{2m-1}{m-1} - 2^{2m}, & m < n \end{cases}$$

The proof is based on the knowledge of the powers of the eigenvalues of the adjacency matrix of path.

We get in particular the sequence A198632 of The Online Encyclopedia of Integer Sequences which is the triangle version of the array of the number of closed paths of even length on a path.





New structural properties of trees with minimal ABC index

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Introduction

Let $G = (V, E)$ be a simple undirected graph of order n and size m . The **atom-bond connectivity index** or **ABC index** of G is defined as

$$ABC(G) = \sum_{uv \in E} \sqrt{\frac{d(u) + d(v) - 2}{d(u)d(v)}}$$

where $d(v)$ denotes the degree of the vertex v .

The ABC index is a molecular-graph based structure descriptor, introduced in 1998 by Estrada, Torres, Rodríguez and Gutman. It can be a valuable predictive tool in the study of the heat of formation in alkanes and the strain energy of cycloalkanes.

In 2008, a second paper by Estrada elaborates a novel quantum-theory-like justification for this topological index. Since then the interest of ABC-index has grown rapidly and has attracted a lot of interest both in mathematical and chemical research communities.

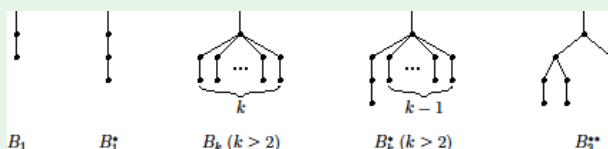
Problem and aim

It was proven, in 2009, that a star is the tree with maximal ABC index. Although recently there was a significant progress in the characterization of the trees with minimal ABC index, known as **minimal-ABC trees**, the full characterization is not yet completed.

The aim of this project is to make a step forward towards the full characterization of minimal-ABC trees.

Results

The branches



play a fundamental role in our research.

It is known that minimal-ABC trees do not contain

1. internal paths of any length greater than 1 and
2. pendent paths of length greater than 4 and contain at most one pendent path of length 3.

We proved that a minimal-ABC tree of order $n > 18$ with a pendent path of length 3 does not contain:

1. more than one B_2 -branch;
 2. a B_1 -branch or a B_1^* -branch;
- and
3. contains a B_2 -branch if and only if it is of order 161 or 168.

Moreover, in this case, a minimal-ABC tree is comprised of a single central vertex, B_3 -branches and one B_2 -branch, including a pendent path of length 3 that may belong to a B_2^* -branch or a B_3^* -branch.

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Acknowledgment

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Wiener index of quipus

M. Ghebleh, A. Kanso, D. Stevanović
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Abstract. We resolved a few open problems on the graph equation $W(L^2(T))=W(T)$, where T is a tree, W is the sum of all distances in a graph and L is the line graph.

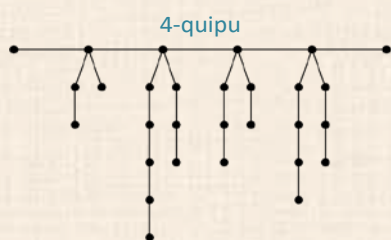
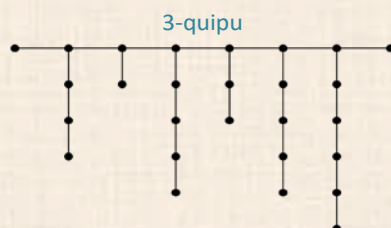
Dobrynin and Mel'nikov [1] asked to find an infinite family of solutions of graph equation

$$W(L^2(T))=W(T)$$

that contains a solution with arbitrarily many pendant paths of arbitrarily large length. Knor and Škrekovski [2] and Knor, Škrekovski and Tepeh [3] further conjectured that its solutions contain only a bounded number of vertices of degree at least three, and no vertex of degree larger than six.

We searched for solutions in the class of quipus (right) for which the above equation reduces to nonlinear Diophantine equation in terms of the number and lengths of quipu's cords:

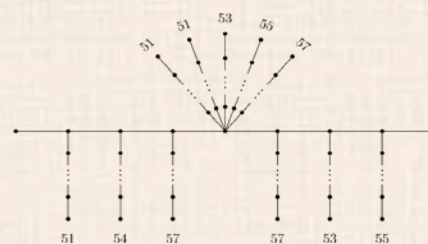
$$\frac{1}{2}n^3 + n^2 - \frac{5}{2}n - 1 + \frac{1}{2}n \sum_{i=1}^n h_i^2 + \left(\frac{1}{2}n^2 - n - 2\right) \sum_{i=1}^n h_i - \left(\sum_{i=1}^n h_i\right)^2 + \sum_{i=1}^n i^2 h_i - (n+1) \sum_{i=1}^n i h_i = 0$$



Mining the large set of solutions among quipus (see tables below), we discovered in [4] an infinite family of solutions which for each $t > 4$ contains a quipu with $12t^2 - 201$ vertices of degree three whose each cord has length either $8t^2 - 136$ or $8t^2 - 135$.

We further discovered an infinite family of solutions with arbitrarily many vertices of degree four in [5], together with examples of solutions with vertices of degree 7, 8 and 9.

Solution with a vertex of degree 7



Number of solutions among 3-quipus

Height	$n = 8$	$n = 9$	$n = 10$	$n = 11$
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	98	0	0	0
6	1,450	999	158	0
7	7,556	17,440	27,919	2,642
8	20,038	95,532	448,170	228,851
9	40,696	294,414	2,665,731	3,468,250
10	63,418	650,410	9,066,164	215,058,404

Number of solutions among 4-quipus

Height	$n = 3$	$n = 4$	$n = 5$	$n = 6$
12	175	2,258	1,610	0
13	259	5,062	14,245	56
14	327	10,668	66,303	26,730
15	477	18,916	231,880	283,940
16	638	33,204	628,512	2,403,602
17	734	51,622	1,443,760	11,426,479
18	987	77,456	3,078,456	42,422,052
19	1,152	112,642	5,882,413	125,256,913
20	1,279	159,974	10,360,898	328,979,427

Acknowledgement:

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Radiological Assessment of Flour Consumed in Kuwait

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Abstract

A study of long-lived gamma emitters in flour was performed. The flour samples, which were collected from the local market, were manufactured in 6 different countries. The targeted radionuclides were ²²⁶Ra, ²²⁸Ra, and ⁴⁰K. Gamma spectrometry revealed the presence of ²²⁶Ra and ⁴⁰K in all samples, while ²²⁸Ra was present above the detection limit in 14 samples. The calculated lifetime cancer risk factor was found to be significantly lower than the acceptable risk level, thus verifying the radiological safety of the studied samples for the targeted radionuclides.

Introduction

Radioactivity in the environment is caused mainly by natural sources. Common natural radionuclides include the potassium isotope ⁴⁰K, uranium ²³⁸U and its decay series, and thorium ²³²Th and its decay series. In addition to being long-lived (in the order of 10¹⁰ years), these natural occurring radioactive materials (NORM) are typically present in air, soil, and water in different amounts and varying levels of activity. Therefore, the presence of NORM in environmental samples is inevitable.

NORM find its way to humans through a number of pathways, one of which is food ingestion. In other words, radioactivity exposure to the general public is directly related to the amount and type of the consumed food. This firm relationship raised interest and concerns towards the radiological safety of food consumption.

Flour is an important type of food that constitutes a large part of the food pyramid. Although most flour is made of wheat, some types are made of rice and grams (chickpeas). By providing more options, this variation is intended to serve people with digestive intolerances. Being globally popular, flour is consumed in many cultures to make basic food items, like bread, as well as complementary dishes, like pastries and desserts. In Kuwait flour is subsidized, thus making it more affordable by the general public, and hence more popular. considered a popular food item Among the most consumed food item is flour.

Objective

- To measure long lived gamma emitting radionuclides in flour consumed in Kuwait.

Methods

Flour samples were collected from the Kuwaiti local market. The collection took place between September and December of 2015. To ensure a comprehensive and a wide-spread representation, 18 different samples that were manufactured by 6 different countries were selected. All samples underwent gamma spectrometry where the targeted radionuclides were ²²⁶Ra, ²²⁸Ra, ⁴⁰K. The radiation measurement was performed in accordance to the procedures provided by the International Atomic Energy Agency (IAEA) [1]. Moreover, the lifetime cancer risk (LRC) was calculated for all samples based on the methodology provided by the United States Environmental Protection Agency [2].

Results

Table 1 shows the activity concentrations (Bq kg⁻¹) for the targeted radionuclides. The table reveals that ²²⁶Ra and ⁴⁰K were detected in all samples, while ²²⁸Ra was present above the detection limit in 14 samples. Figures 1, 2, and 3 present the lifetime cancer risk (LRC) for all the tested samples, where the calculated values are significantly lower than the acceptable risk value.

Conclusion

The present study is the first at the national level to investigate radiological safety of flour. In light of the findings, consumption of flour is radiologically safe for the presence of the targeted radionuclides.

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Acknowledgement

The authors thank Mr. Suraish for his help in sample preparation.

Table 1

Sample	Origin	Ingredient	²²⁶ Ra (Bq kg ⁻¹)	²²⁸ Ra (Bq kg ⁻¹)	⁴⁰ K (Bq kg ⁻¹)
1	India	Green Flour	1.33 ± 0.02	ND	52.53 ± 3.10
2	India	Green Flour	0.70 ± 0.03	ND	332.26 ± 17.26
3	India	Green Flour	0.40 ± 0.02	ND	286.76 ± 16.52
4	India	Green Flour	0.20 ± 0.01	ND	349.20 ± 17.27
5	India	White Flour	0.74 ± 0.04	0.11 ± 0.06	44.57 ± 2.76
6	India	White Flour	0.20 ± 0.01	0.76 ± 0.08	50.30 ± 2.57
7	Kuwait	White Flour	0.70 ± 0.04	ND	32.53 ± 1.57
8	Kuwait	White Flour	0.20 ± 0.01	0.02 ± 0.01	136.03 ± 6.51
9	Kuwait	White Flour	0.70 ± 0.04	1.10 ± 0.10	32.45 ± 1.58
10	Kuwait	White Flour	0.20 ± 0.01	0.02 ± 0.01	136.03 ± 6.51
11	Kuwait	White Flour	0.40 ± 0.02	0.10 ± 0.07	125.57 ± 6.86
12	Kuwait	White Flour	0.20 ± 0.01	0.02 ± 0.01	136.03 ± 6.51
13	Kuwait	Green Flour	0.40 ± 0.02	1.38 ± 0.12	328.13 ± 15.63
14	Kuwait	Green Flour	0.20 ± 0.01	ND	382.33 ± 17.64
15	Kuwait	White Flour	0.40 ± 0.02	0.76 ± 0.08	28.48 ± 1.50
16	Thailand	White Flour	0.40 ± 0.04	0.10 ± 0.07	146.36 ± 7.67
17	Thailand	White Flour	0.70 ± 0.04	0.80 ± 0.09	18.86 ± 1.03
18	United Kingdom	Green Flour	0.20 ± 0.01	0.10 ± 0.07	328.21 ± 15.64
Average ± SD			0.50 ± 0.08	0.26 ± 0.07	161.06 ± 142.50

Figure 1

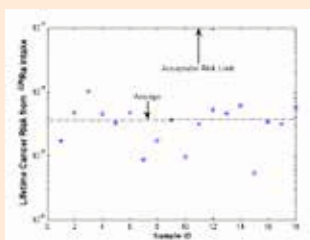


Figure 2

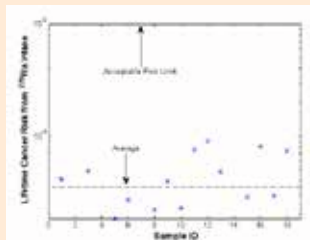
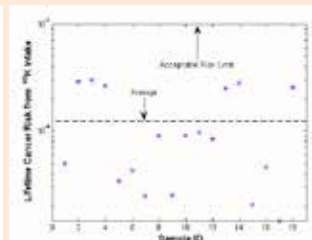


Figure 3



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Gross Alpha, Beta activity concentration and average Annual Committed effective dose due to Natural radioactivity in some Tea and Herbal tea consumed in Kuwait.

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Abstract: The gross Alpha and Beta radioactivity concentration of some popular tea and herbal tea preparations that are consumed in Kuwait are investigated. It is found that for all the samples the average annual Alpha and Beta committed effective dose fall within the recommended limit of average annual committed effective dose due to natural radiations which ranges between 0.2 – 0.8 mSv/yr for ingestion (UNSCEAR 2008).

Introduction

Natural Radionuclides are found in almost all constituents of our environment. The natural radionuclides and their decay products of Uranium-238, and Thorium-232 series along with Potassium-40 are the major contributing sources of natural radioactivity in the environment. Human beings are exposed to Natural radioactivity due to both external (Terrestrial and cosmic radiations) and internal exposure in the form of Inhalation (Air) and ingestion (Food and water).The world average for total contribution from all sources of natural background radiation is 2.4 mSv/yr (UNSCEAR).

Tea (Both black and green) and herbal tea is a popular beverage consumed all over the world both as a stimulant and for their medicinal properties respectively. On the basis of an average 2 Cups per day, the annual consumption add up to 730 Cups. The natural radioactivity of the Uranium and thorium series radionuclides found in the tea leaves are the major contributor to the dose due to this ingestion of tea.

Objectives

Investigation of Gross Alpha, Beta activity and average annual Committed effective dose due to consumption of Tea and herbal tea in Kuwait. This was the first study that is being conducted in Kuwait to establish a baseline data. This study emphasizes on evaluating average annual committed effective dose levels for adult population and thereby to verify the radiological dose contribution and safety in consuming such Tea beverage.

Methods

The tea and herbal tea samples were collected from the local market. In order to have a wide variety and geographical representation, many brands of tea from different countries were selected for this study. (Table 1). The Tea samples were infused in 200 ml (1 cup) boiling water and evaporated and dried on to a sample holder and counted for 65000 secs using a pre calibrated low background Alpha Beta counter. (Figure 1)

The net count rate in alpha and Beta channel were converted into the activity concentration (Bq/2gm)of gross alpha and gross beta using the formula:

$$A_{(α/β)} = \frac{C_{(α/β)}}{t \times \epsilon_{(α/β)}} \quad (1)$$

Where Activity = $\frac{\text{Net sample count rate}}{\text{Efficiency}}_{(α/β)}$

M_{sample} = Mass of each sample (2 gms).

The annual alpha and beta effective dose due to intake of Tea was determined by averaging the individual annual committed doses contributed by the major alpha and beta emitters in the Uranium -238 and Thorium-232 Series of naturally occurring radionuclides.

$$E_{avg}(α/β) = (1/N) \left[\sum_i^R A_{(α/β)} \times DCF_{i(α/β)} \right] \times (730)$$

Where E_{avg}(α/β) is the average gross annual alpha or beta committed effective dose in tea, A_(α/β) is the gross alpha or beta activity concentration present in tea sample and DCF_{i(α/β)} is the dose conversion factor for ingestion of individual natural radionuclides of Uranium -238 and Thorium-232 series for an adult taken from UNSCEAR (2008) report. N is the number of individual radionuclides of Uranium -238 and Th-232 series. It was also assumed that on an average 2 cups of tea is consumed per day and a total of 730 cups of tea consumed per year.

Results

The results are shown in table 1. It can be seen that the average annual committed effective dose from alpha radiation ranged from 0.0002mSv/yr - 0.0032mSv/yr and for beta radiation it varied from 0.21mSv/yr-0.75 mSv/yr with highest being for Hibiscus herbal tea.

Conclusion:

The Average Annual Committed Effective Dose for all the tea samples was within the recommended range 0.2 mSv/yr- 0.8 mSv/yr. Hence, consuming these tea is Radiologically safe.

References

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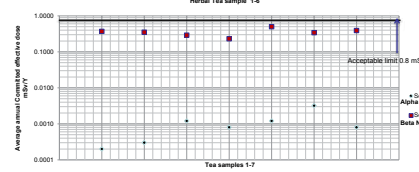
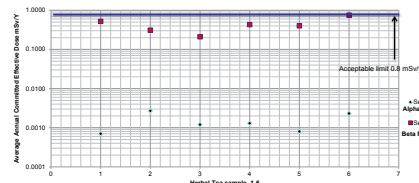
Table 1: Average annual committed effective dose for Tea samples.

Sino	Brand name	Country of Origin	Committed Effective dose	
			Average for Alpha Radionuclide mSv/yr	Average for Beta Radionuclide mSv/yr
H1	1 Basal leaf	Kuwait	0.0004	0.52
H2	2 Yerbamate tea	USA	0.0027	0.31
H3	3 Thyme	Egypt	0.0012	0.21
H4	4 Chemomile	Egypt	0.0013	0.43
H5	5 Anise flower	Egypt	0.0008	0.40
H6	6 Hibiscus flower	Egypt	0.0023	0.75
T1	1 Black tea	Srilanka	0.0002	0.34
T2	2 Black tea	Sri lanka	0.0003	0.29
T3	3 Black Tea	India	0.0012	0.29
T4	4 Green Tea	Sri lanka	0.0008	0.23
T5	5 Black Tea	Bangladesh	0.0012	0.50
T6	6 Black Tea	India	0.0032	0.34
T7	7 Black Tea	India	0.0008	0.39

Figure 1: Sample preparation and Measurement



Slow evaporation of Tea Infusion Final Drying under IR lamp



Low Background Alpha Beta Counter



Synthesis and characterization of ZnO nanowires and their use in photovoltaic applications

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Introduction and Motivation

ZnO:

unique characteristics applicable to many technologies: electronics, optoelectronics, spintronics, sensing, and renewable energy



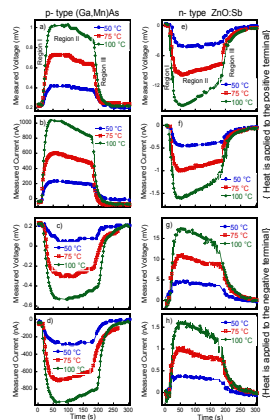
> wide band gap, a large exciton binding energy

> high electron mobility, high thermal conductivity, and a large piezoelectric constant



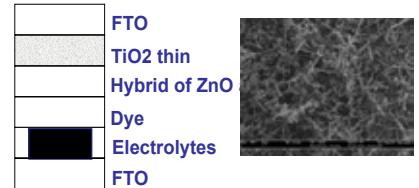
ZnO PV Geometry: Need Nanowires to reduce Charge recombination that influences and reduces the solar conversion efficiency.

Hot probe results



(Ga,Mn)As
p-type

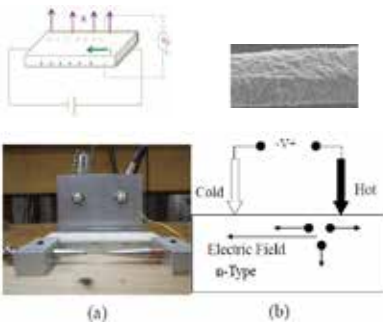
ZnO:Sb
n-type



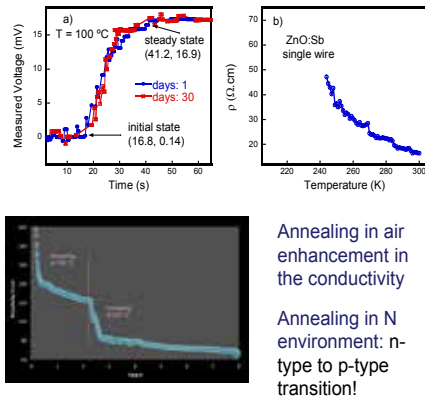
	Efficiency (%)
Pure ZnO nanoparticles	1.35
25 wt. % ZnO nanoparticles	2.38
75 wt. % ZnO:Sb wires	
50 wt. % ZnO nanoparticles	2.64
50 wt. % ZnO:Sb wires	
75 wt. % ZnO nanoparticles	2.12
25 wt. % ZnO:Sb wires	

Experimental Method

Hot Probe technique vs. Hall effect measurements for electrical measurements



Electrical resistivity Results



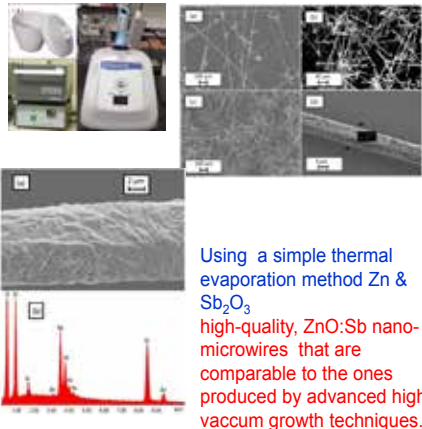
Annealing in air enhancement in the conductivity

Annealing in N environment: n-type to p-type transition!

Conclusions

- The hot probe technique is successfully used to estimate the conductivity and to identify conduction type in Sb-doped ZnO wires.
- The overall results on single Sb-doped ZnO wires show a stable n-type behavior.
- Annealing the ZnO:Sb wires in air enhancement in the conductivity and result in better single crystals
- The high resistivity of the wires suggests the presence of mixed phases rather than a homogeneous single phase of Sb-doped ZnO
- The ZnO:Sb wires plays an important role as the direct path for charge transport and subsequently increase the dye sensitized solar cell efficiency

Experimental Results



Using a simple thermal evaporation method Zn & Sb₂O₃ high-quality, ZnO:Sb nanowires that are comparable to the ones produced by advanced high vacuum growth techniques.

Dye Sensitized Solar Cell

"Black Dye", an anionic Ru-terpyridine

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Acknowledgment

We thankfully acknowledge the support of Kuwait University under the general facility of the faculty of science project (GS 02/10) and Semiconductor research facility, research administration project (GE01/08).



Magnetic and Optical Properties of Co-doped ZnO Nanocrystalline Particles

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Introduction

Magnetic semiconductors are materials that exhibit both ferromagnetism and semiconducting properties. Traditional electronics are based on control of charge carriers but magnetic semiconductors would also allow control of quantum spin state and therefore it can provide a new type of conduction (spintronics).

ZnO is an extensively studied semiconductor due to its versatile properties applicable to many technologies including electronics, optoelectronics and spintronics.

The theoretical prediction and the experimental observation of room temperature ferromagnetism in transition metal doped ZnO has opened up the possibility to use this diluted magnetic semiconductor (DMS) in magneto-optics and magneto-electronics (spintronics) technologies.

Experimental Methods

Zn_{1-x}Co_xO nanoparticles with x = 0.0, 0.025, 0.05, 0.075, 0.1, and 0.2 were prepared by solid state reaction method. Mechanical alloying was performed in a planetary ball-mill (Fritsch Pulverisette 7) using a ball to powder ratio of 8:1. Milling was carried out for 12 hours with an angular frequency of 250 rpm. After mechanical milling, the mixture was pressed at 10 kN into disks, 2 cm in diameter. These disks were annealed in air atmosphere at 850°C for 4 hours. The XRD analysis was carried out using X-ray diffractometer with CuK_α radiation.

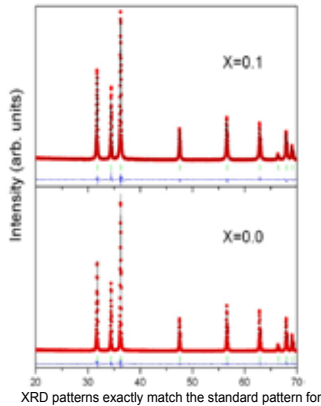
The particle size and morphology was determined from SEM imaging.

The XPS spectra were recorded on a Thermo ESCALAB 250 Xi spectrometer using Al K_α radiation (1486.6eV).

The magnetization measurements were performed using a Quantum Design 9T-PPMS EverCool-II magnetometry.

The absorption measurements were carried out using Agilent Cary 5000 UV-Vis-NIR Spectrophotometer and the diffuse reflectivity measurements were carried out using the Shimadzu Solid Spec-3700 UV-Vis-NIR Spectrophotometer.

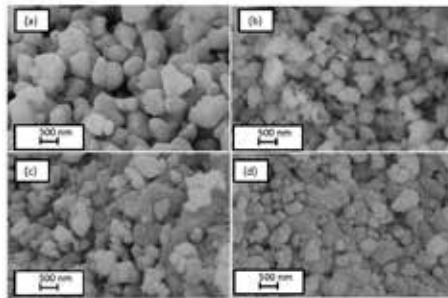
Structural Characterization



XRD patterns exactly match the standard pattern for hexagonal wurtzite structure.

(single Phase Zn_{1-x}Co_xO)

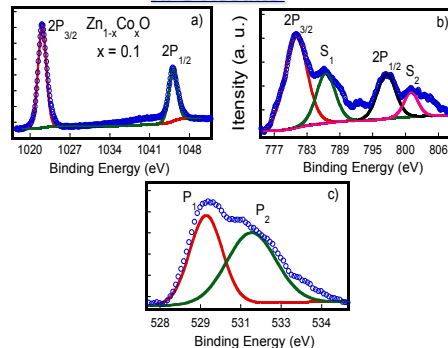
Morphology



SEM images for representative samples of Zn_{1-x}Co_xO with (a) x = 0.0, (b) x = 0.025, (c) x = 0.075, and (d) x = 0.1.

The average grain size for the pure ZnO is about 300 nm, the grain size decreases with increasing the Co doping.

XPS Results



(a) Zn 2p, (b) Co 2p and (c) O 1s core level spectra after deconvolution into Gaussian peaks for Zn_{1-x}Co_xO nanoparticles, with x = 0.1.

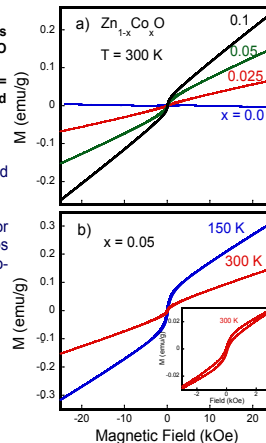
Co atoms are incorporated in tetrahedral sites of the wurtzite host matrix and no secondary phases were detected

Magnetic properties

(a) Magnetization Hysteresis curves of (a) all Zn_{1-x}Co_xO samples at 300 K and (b) Zn_{1-x}Co_xO sample with x = 0.05 measured at 300 K and 150 K.

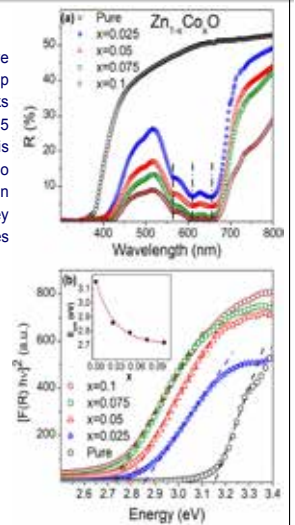
Pure ZnO shows standard diamagnetic behavior.

A ferromagnetic behavior with clear hysteresis loops was observed in all Co-doped ZnO samples



The spectra involve three sub-band gap absorption peaks located at 568, 615 and 659 nm, this indicates that Co ions are in high-spin states and they occupy the Zn²⁺ sites of ZnO.

With increasing Co-doping, a decrease in the energy gap is observed.



(a) The diffuse reflectance spectra and (b) the Tauc Plots of Zn_{1-x}Co_xO nanoparticles with different Co doping. The inset shows the energy gap as a function of Co concentration.

Conclusions

Zn_{1-x}Co_xO nanocrystalline particles were successfully synthesized by the simple mechanical solid state reaction method.

XRD analysis reveal that all samples have hexagonal wurtzite structure and no secondary phases were detected.

XPS results showed that Co atoms have been successfully incorporated in tetrahedral sites of the wurtzite host matrix and no secondary phases or Co rich clusters were detected.

All Co-doped ZnO nanoparticles showed ferromagnetic behavior at room temperature with small coercive fields.

A clear red shift was observed in the band gap of the Co-doped ZnO nanoparticles as a consequence of the successful incorporation of Co²⁺ ions into ZnO lattice.

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Acknowledgement

We thankfully acknowledge the support of Kuwait University under the general facility of the faculty of science (Project GS 01/10 and GS 02/08, Electron Microscopy Unit) and Semiconductor research facility, research administration (project GE01/08).



Femtosecond laser based thin film deposition



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*Department of Physiology, Faculty of Medicine, Kuwait University.

Abstract

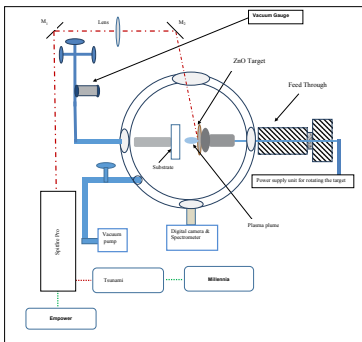
Zinc oxide thin films are prepared on glass substrate at room temperature by femtosecond pulsed laser deposition. The morphological and surface characterisation of the thin film is studied using Scanning Electron Microscope & Atomic Force Microscope. The structural investigation of the film revealed its polycrystalline hexagonal nature. The band gap energy determination of ZnO films are done using UV-VIS characterisation. The Plasma emission lines of ZnO are also studied from the ablation plume.

Introduction

Zinc oxide has a direct band gap of 3.37 eV in its crystalline state and a high exciton binding energy of 60 MeV at room temperature. The thin film prepared by pulsed laser deposition technique was characterised by using several techniques. The morphological and structural characterization were performed using SEM analysis & XRD technique. The elemental analysis were performed using XPS & EDS technique. The optical reflectance measurement was also done for calculating the band gap of the thin film prepared. For this UV-VIS analysis was performed. The high resolution images of the thin film surface in atomic scale is studied using Atomic Force Microscopy (AFM). The effect of near infrared femtosecond laser on a specific target and their thin film coatings on a specific substrate under several conditions are studied and the films are characterised.

Methods

Femtosecond laser pulsed light was focused on a target material where it evaporates the target surface creating a plasma plume that results in the condensation of the material vapor on another substrate placed close to the target surface.



Fig(1). Experimental set up for Pulsed Laser Deposition.

Results

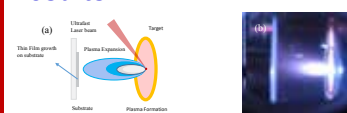


Fig.2.a. Schematics of the plasma plume generation, Fig. 2.b. Experimental plasma formation

The plasma plume generated by the femtosecond amplifier is visualized using a digital camera from the side window and spectral analysis of the ablation plume was done using an Ocean Optics USB 400 Spectrometer from the same side window.

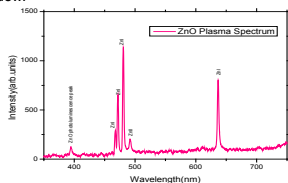


Fig.3. Emission spectra of ZnO plasma plume produced by the Fs laser at 800 nm under vacuum.

Film Surface characterization by SEM & AFM & XPS

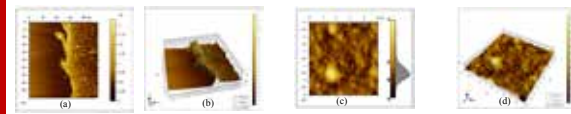


Fig (4) AFM surface images of the ZnO thin films formed on glass substrate with a laser exposure time of 10 minutes (a) Thickness measurement (b) 3-D view of the film (c) Roughness measurement of the film (d) Roughness measurement 3-D view.

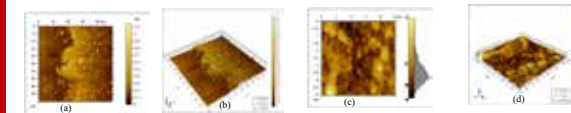


Fig (5) AFM surface images of the ZnO thin films formed on glass substrate with a laser exposure time of 5 minutes (a) Thickness measurement (b) 3-D view of the film (c) Roughness measurement of the film (d) Roughness measurement 3-D view.

Laser exposure time	Thickness of the film	Roughness of the film
10 minutes	866 nm	72 nm
5 minutes	537 nm	87.9 nm

Table (1) Thickness & roughness measurements of the thin film using AFM

From the XPS analysis we found that the main components are zinc & oxygen and also some carbon are there. The plots obtained from XPS with the corresponding lines are shown below.



Fig (6). XPS analysis plots of (a) 10 minutes exposure film (b) 5 minutes exposure film.

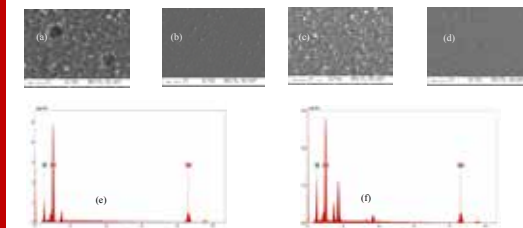


Fig (7). SEM surface images of the ZnO thin film with laser exposure for 10 & 5 minutes in various magnification (a) 10 minutes film 10000 times magnified, (b) 10 minutes film 1000 times magnification, (c) 5 minutes film 10000 times magnified, (d) 5 minutes film 1000 times magnified, (e) EDS analysis of the 10 minutes thin film (f) EDS analysis of the 5 minutes thin film.

Structural investigation of the thin film by XRD analysis.

X-ray diffraction technique was used for the structural investigation of ZnO thin films. From the analysis of XRD pattern of the thin film prepared using PLD, it's confirmed that the thin film exhibited a crystalline nature and seems to be rough. The studies have shown that the ZnO thin film is having a polycrystalline hexagonal structure. The polycrystalline hexagonal structure revealed the low island growth model of thin film. In this model the film atoms are more tightly bound each other than to the substrate. In this case 3 dimensional islands nucleate and grow directly on the surface of the thin film.

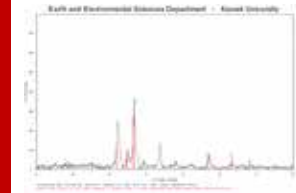


Fig (8). The XRD analysis result for the thin film with laser exposure time 10 minutes.

Band gap energy determination of zinc oxide thin film using UV- VIS characterisation

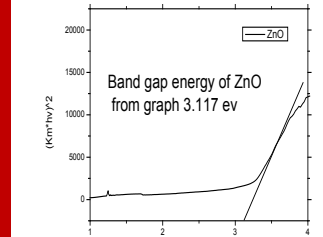


Fig (8). $h\nu - (h\nu - E_g)^2 \propto \ln(I_0/I)$ for zinc oxide film

Diffuse reflectance measurement of the obtained zinc oxide thin film was done using UV-VIS spectrophotometer. Band gap energy of the thin film was determined using the Tauc Plot from diffuse reflectance spectrum and its found to be 3.117 eV.

Conclusion

This work presented the formation and characterisation of ZnO thin film on a glass substrate prepared at room temperature femtosecond PLD. The characterisation of thin film including morphological, structural and optical studies is a solid base for further ZnO research projects. The dependence of thin films on various PLD parameters are also studied by varying the conditions to find out the optimum conditions favourable for depositing nanoparticles perfectly on substrates.

Acknowledgement

General Facility projects GS03/01,GS01/08 ,GS02/08 & GE01/08 are thankfully acknowledged. We also acknowledge the use of facilities at Electron Microscopy Unit (FESEM).

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Peculiar thermal emission of dense superheated cesium vapor

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Abstract: Thermal emission from the superheated cesium vapor was studied to very high temperatures from 700 °C to 1000 °C. This was performed in the vapor condition only and no liquid cesium presence in the all-sapphire cell. We observed number of atomic and molecular spectral features in emission and absorption. Especially peculiar thermal emission of cesium dimer diffuse bands ($2\ ^3\Pi_g \rightarrow a\ ^3\Sigma_u^+$ transitions) around 710 nm was coexisting with absorption bands around first resonance lines at 852 nm and 894 nm. We also performed absorption measurements and compared observed diffuse band profiles with emission ones. Possible application of the observed phenomena will be discussed in terms of the concentrated solar energy conversion using dense cesium vapor.

Introduction:

Superheating in the alkali cells leads to thermal destruction of the alkali molecules, which have been used in the past for several purposes. The main purpose was to get rid of molecular contribution of the spectrum and to observe pure atomic spectral phenomena. Recently, thermal destruction was used to study structured photoionization continuum of the superheated cesium vapor in which both atomic and molecular contributions were present at different fractions at different temperatures. From the molecular destruction behavior, at superheated conditions, it was possible to extract pure molecular contribution to the photoionization process. Here we performed two experiments with hot cesium vapor in the all-sapphire cell. In one we measured absorption co-efficient by using background light source and in another using self emission from the oven with cesium cell at temperatures between 700°C and 1000°C, where superheating conditions exist. Observed peculiar emission of Cesium dimer bands around 710 nm.

Objectives:

- Calculate absorption co-efficient of Cesium by shining white light from LDLS on the cesium cell in the heater. Absorption co-efficient is calculated by Beer-Lambert's law

$$k = \frac{1}{L} \ln \frac{I_o}{I}$$

- Observe the phenomena of self emission from cell by maintaining the cesium cell in superheating conditions.

Methods:

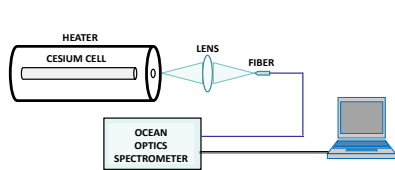


Fig.1. Schematic of the experimental setup.

All sapphire cell containing a very small droplet of cesium was heated inside an oven to temperatures up to 1000°C. We observed red glow from oven already at 700°C. Cesium all sapphire cell of 16 cm in length was heated within a cylindrical oven. The temperature of the cell was measured using thermocouple positioned at the end side of the cell. The cell is practically closed except for two small openings for collection of emitted light and transmission measurements. Emission spectrum from the cell was acquired using HR4000CG-UV-NIR Ocean Optics spectrometer with QP600-2-VIS_NIR fiber. The cell was heated slowly from the room temperature up to 700 °C where it was held for one hour in order to make measurements at equilibrium condition.

Then the temperature was increased to higher temperatures and was held for one hour for appropriate measurements, till the final temperature of 1000 °C. In order to determine the absorption co-efficient of the cesium superheated vapor in the temperature range from 700 °C to 1000 °C we performed transmission measurements using Laser Driven Light Source (LDLS, Model EQ-99-FC, Energetiq as a background continuum. Ocean Optics spectrometer was used for data acquisition. Experiments were repeated several times for averaging and noise reduction. At every temperature we waited several minutes until the temperature is constant and saturated at the given value.

Results

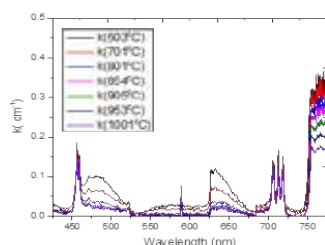


Fig.2. Absorption Co-efficient at various temperatures.

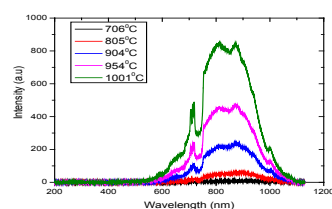


Fig.3. Emission spectra at various temperatures

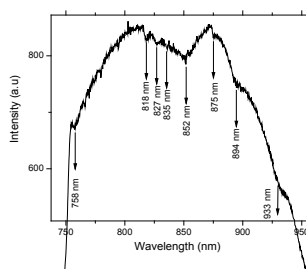


Fig.4. Enlarged portion between 750 and 950 nm with several Cs and Cs₂ absorption features at 1001°C

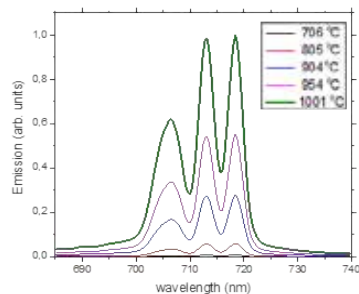


Fig.5. Theoretical calculations of the emission of Cs₂ diffuse bands at 710 nm

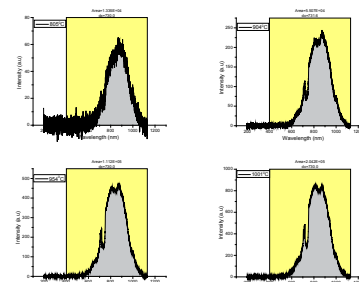


Fig.6. Four integration area of the thermal emission

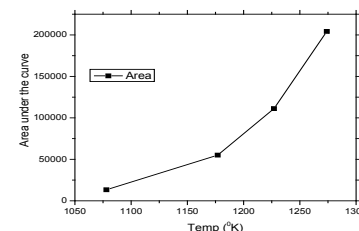


Fig.7. Area versus temperature plot.

Conclusion

We measured thermal emission from the superheated cesium vapor at very high temperatures from 700 °C to 1000 °C. This was performed in the condition of no liquid cesium presence in the all sapphire cell. We observed number of atomic and molecular spectral features in emission and absorption. Especially peculiar thermal emission of cesium dimer diffuse bands ($Cs_2\ 2\ ^3\Pi_g \rightarrow a\ ^3\Sigma_u^+$ transitions) around 710 nm was coexisting with absorption bands around first resonance lines at 852 nm and 894 nm. We performed appropriate calculation of the diffuse band emission profiles and compared with observed profiles. Hot cesium vapor could be used for the energy conversion devices. It is therefore of interest to investigate the intrinsic emission of cesium vapor in the temperature interval from 700 °C to 1000 °C and higher. The application of the observed phenomena to the concentrated solar energy conversion will be studied in the near future.

Acknowledgements:

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Entanglement entropy at the phase transition of the $q=4$ quantum Potts model in 1d

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The entanglement entropy, S , is considered as an indicator of the changing ground state of a many body quantum system. At a quantum critical point in one dimension S generally has a singularity. Here we consider quantum spin chains with continuous quantum phase transition, the prototype being the q -state quantum Potts chain for $q=4$ and calculate S across the transition point. According to numerical, density matrix renormalization group results at quantum phase transition point S shows a logarithmic singularity. In the low magnetic field region a perfect ferromagnetic state is identified while in the high magnetic field region a perfect paramagnetic state is pointed out.

1. Introduction:

Entanglement is a peculiar feature of quantum mechanics, which is related to the presence of nonlocal quantum correlations. In a quantum many-body system the entanglement between a spatially conned region A and its complement B is quantized by the entropy. If the complete system is in a pure quantum state $|\Psi\rangle$, with a density matrix $\rho = |\Psi\rangle\langle\Psi|$, then the entanglement entropy is just the von Neumann entropy of either subsystem given by

$$S_A = -\text{Tr} \rho_A \ln \rho_A = -\text{Tr} \rho_B \ln \rho_B = S_B \quad (1)$$

Here the reduced density matrix is $\rho_A = \text{Tr}_B \rho$, and analogously, $\rho_B = \text{Tr}_A \rho$. The entanglement entropy is a sensitive indicator of quantum correlations in the ground state, therefore it is used to monitor the different phases and the separating quantum phase transitions in quantum systems.

2. The system and its phases: The 1D quantum Potts^{3,4} model defined by the Hamiltonian

$$H = -J \sum_{i=1}^L \delta(s_i, s_{i+1}) - h \sum_{i=1}^L \sum_{k=1}^{q-1} M_i^k \quad (2)$$

With $s_i = 1, 2, 3, \dots, q$ is a q -state spin variable and M_i^k is the spin flip operator: $M_i^k |s_i\rangle = |s_i - k, \text{mod } q\rangle$. Sometimes another representation of the states $|s_i\rangle$ is convenient to use in which the transverse fields are diagonal:

$$H' = -\frac{J}{q} \sum_{i=1}^L \sum_{k=1}^{q-1} M_i^k M_{i+1}^{q-k} - h \sum_{i=1}^L R_i \quad (3)$$

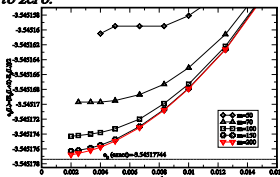
Where diagonal operator R_i is defined as $\langle s_i | R_i | s_i \rangle = -1 + q \delta(s_i, 1)$.

The chain is in the ferromagnetic state for $h > h_c = J/q$ and ferromagnetic state for $h < h_c$. Between the two states at h_c there is phase transition which is second-order for $q \leq 4$ and first order for $q > 4$.

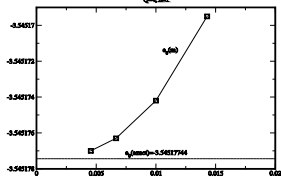
If $h=0$, the chain is an **ideal ferromagnet** and the ground state be written by using the (2) representation as $|\Psi_0\rangle = \frac{1}{\sqrt{q}} (|11\dots 1\rangle + |22\dots 2\rangle + \dots + |qq\dots q\rangle)$. If $J=0$, the chain is an ideal paramagnet, which can be easily described by (3) in which the ground state is $|\Psi_0\rangle = (|1' 1' \dots 1'\rangle)$.

3. The exactly known ground state energy and the latent heat^{2,3,4} and basic features¹ of the continuous phase transition can serve as checkpoints of the infinite-lattice DMRG calculation^{5,6}.

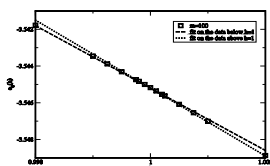
Ground state energy agrees with the theoretical results. The estimates of the latent heat tends to zero.



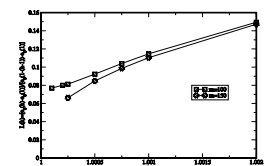
The ground state energy $e_0 = E_0(L)/L$ at the critical point, $h=1$, can be calculated with a very high accuracy by the DMRG method.



The ground state energy $e_0 = E_0(L)/L$ as a function of m the size of the basis of the DMRG method. Obviously, increasing m results increasing accuracy.



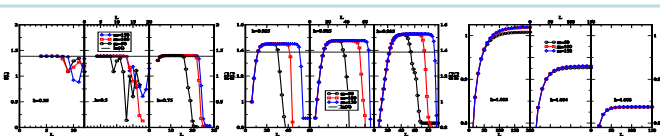
The ground state energy $e_0 = E_0(L)/L$ at the critical point, $h=1$ and around it. Below and above the critical point the slopes of the data are slightly different.



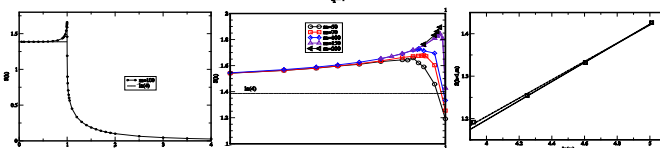
The estimates of the latent heat $L(h)$ decreases as we one get closer to the critical point. Higher m represents again higher accuracy.

4. The entanglement entropy and its logarithmic singularity at the phase transition

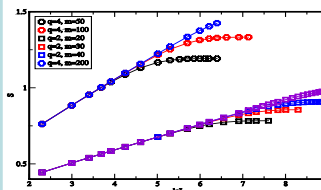
The entanglement entropy data from the DMRG calculation gets more and more stable by increasing basis size of the Hilbert space applied in the DMRG approach. The truncation error (10^{-6}), which characterizes the accuracy of the energy estimates of DMRG, has no direct relevance for the entropy data.



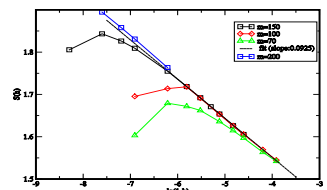
DMRG results for the entanglement entropy for increasing magnetic field h and basis size m as a function chain size L . For larger basis size m the stability (accuracy) of data is enhanced. Obviously, the entropy is peaked around the phase transition point $h=1$. In the low- h limit $S=\ln(4)$, in the large- h limit $S=0$, in agreement with basic theoretical expectations.



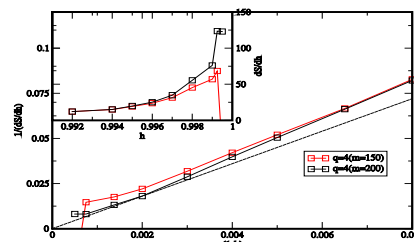
The entanglement entropy of the ground state energy as a function of transverse magnetic field h . Evidently the entropy is peaked around $h=1$. With increasing m the peak gets closer to $h=1$. The peak value of the entropy, as well as the value at $h=1$ increases as m is increased. The entropy at $h=1$ shows a logarithmic scaling, right panel.



The entanglement entropy at $h=1$ as a function of $\ln(L)$. The data for different m are saturating at a gradually increasing finite value, but before saturation the data for separate m contributing to a straight line with a slope $1/9$ for $q=4$ and $1/12$ for $q=2$, exactly these values of the slopes are predicted by field theory.



The entanglement entropy as a function of $\ln(1-h)$ below $h=1$. A straight line shows up indicating a logarithmic behavior in the closest neighborhood of $h=1$. With increasing m the data are gradually stabilizing. As one gets closer to $h=1$, for the same accuracy higher and higher values of m is needed.



The differential of the entropy below $h=1$. The estimates of the DMRG calculations depicted as a function of the transverse field shows a clear divergence at $h=1$, see inset. The inverse of the estimates of differential can be fitted with a straight line (dashed line) indicating disappearing inverse differential so infinite large differential in the $h=1$ limit, therefore a divergence. The slope of the dashed line ($1/9$) agrees with field theoretical predictions. Conclusively, the estimates of the entanglement entropy from DMRG calculations have a considerable high accuracy.

5. Conclusion

The entanglement entropy is investigated at a continuous quantum phase transition in the $q=4$ quantum Potts chain. First of all the estimates of the ground state energy are in very good agreement with field theoretical results, DMRG calculations show increasing accuracy with increasing basis size m , as is expected. Furthermore, the entropy data agree with the theoretical expectations both in the low and high- h limit as well as at the critical point. DMRG data seems to produce high accuracy data not only for the energy⁷ also for the entanglement entropy by reproducing several earlier field theoretical findings.

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Properties of the Gravitational Phase Transition in Galaxy Clustering

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Abstract

Many physicists have rightly said that the entropy study of a system is the most important challenge while taking all its correlated details into consideration. The same is true for a cosmological many body system, which models a Universe comprised of a large number of galaxies [1]. The entropy study done by us [2] has led us to predict a gravitational phase transition which occurs with a change from a mildly clustered to highly clustered region and a separate phase transition corresponding to a change from a mildly clustered to a low clustered region. Through analysis of the entropy change in these phase transitions we also find the system exhibits hysteresis, and show our progress towards a plan for constructing a more general phase diagram for such a system.

Introduction

Investigating how galaxies cluster has been a significant area of research within astrophysics. Statistical mechanics has put forward an approach to investigate this clustering. The cosmological many body problem has been studied in depth since the 1960s by Saslaw [1] among others. The problem involves investigating the thermodynamics of a large number of galaxies in an infinite, expanding universe interacting via the gravitational interaction. Galaxy clusters are the largest gravitationally bound objects to have arisen so far in the process of cosmic structure formation.

In terms of the galaxy clustering phenomena, one can think about lightly clustered regions, moderately clustered regions, and highly clustered regions of the Universe. Since the gravitational interaction is the relevant interaction, one can think about the transitions between the different regions as a gravitational phase transition (GPT)

Fig 1: Schematic of expanding universe with a nonuniform distribution of galaxy clusters.



Objectives

- To deduce properties of the gravitational phase transition (GPT) by investigating changes in entropy and the nature of the clustering of galaxies.
- To form a basis for eventually constructing a phase diagram to describe the clustering phenomena in the language of phase transitions.

Methodology

Using a statistical mechanical approach, one can deduce thermodynamical properties about a system such as its equation of state and entropy, among other quantities. Using a quasi-equilibrium approach, for a cluster of galaxies with temperature T and volume V, and number of galaxies N, the partition function Z for the system can be evaluated, where

$$Z_N(T, V, N) = \frac{1}{\Lambda^{3N} N!} \int \exp \left[- \left(\sum_{i=1}^N \frac{m_i^2}{2m} + \phi(\tau_1, \tau_2, \dots, \tau_N) \right) T^{-1} \right] e^{2m\tau} e^{2m\tau} d\tau$$

$$Z_N(T, V, N) = \frac{1}{N!} \left[\frac{2\pi m T}{\Lambda^2} \right]^{3N/2} Q_N(T, V, N)$$

Evaluating Q is nontrivial, but has been done [3]. The result is

$$Z_N(T, V, N) = \frac{1}{N!} \left[\frac{2\pi m T}{\Lambda^2} \right]^{3N/2} [1 + \beta n T^{-3}]^{N-1} \text{ where } \beta = \frac{3}{2} G^3 m^6$$

From the partition function Z, macroscopic thermodynamical quantities such as the pressure p and entropy S may be derived from the Helmholtz free energy F associated with the partition function.

$$p = - \left(\frac{\partial F}{\partial V} \right)_{N, T} \longrightarrow p = \frac{NT}{V} (1-b) \quad b = \frac{n\beta T^{-3}}{1+n\beta T^{-3}}$$

Note that the equation of state contains a quantity b which we call a "galaxy clustering parameter." n is the number density of the cluster. b=0 corresponds to a case of an ideal non-interacting gas, whereas b=1 corresponds to an unphysical limit of all galaxies coalescing into a single point.

$$S = - \left(\frac{\partial F}{\partial T} \right)_{N, V}$$

$$F = -T \ln Z_N$$

$$S = S_0 + N \ln \left[\frac{V}{N} T^{3/2} \right] - N \ln(1-b) - 3Nb$$

Results

Note that we can rewrite the result for the specific entropy S/N in terms of the clustering parameter b.

$$\frac{S}{N} = s_0 - \frac{1}{2} \ln(1-b) - \frac{1}{2} \ln b - 3b$$

There exist nonanalyticities at b=0 and b=1 in the equation for specific entropy. Since the entropy is a first order derivative of the free energy, this can be classified as a first order phase transition which contains nonanalyticities in first order derivatives of the free energy. Furthermore one can obtain more details through studying how the specific entropy of the system changes with respect to the clustering parameter b:

$$\frac{\partial s}{\partial b} = \frac{1}{2(1-b)} - \frac{1}{2b} - 3 \quad \frac{\partial s}{\partial b} = 0 \text{ for } b = b_c = \frac{\sqrt{10} + 2}{6} \approx 0.86$$

The quantity ds/db is plotted in Figure 2, where we also label the following points:

- A: b=0.03, corresponding to the onset of the transition to the unclustered ideal gas like phase.
- B: b=0.43, corresponding to where Saslaw, Ahmed [3] found the specific heat is maximized.
- C: b=0.86, the critical point corresponding to the mildly clustered region.
- D: b=0.98, corresponding to the onset to the phase transition to highly clustered regions.

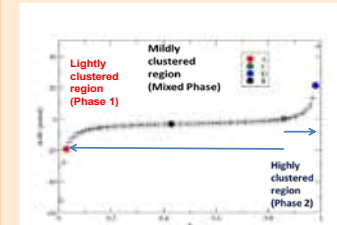


Fig. 2: ds/db vs b from [2].

System can move from C → D, but not D → C. System can move from C → A, but not A → C. System exhibits hysteresis!!

If the system has a mixed phase, then the Clausius-Clapeyron equation can be used to describe such a phase coexistence curve.

Our preliminary result for a more generalized Clausius-Clapeyron equation in for the slope of the coexistence curve in p-b parameter space is the following:

$$\frac{dp}{db} = \frac{T^3}{3\beta b(b-1)} \left\{ T_c \left[\frac{1}{2} \ln \left(\frac{1-b_c}{1-b} \right) + \frac{1}{2} \ln \left(\frac{b_c}{b} \right) + 3(b_c - b) \right] \right\}$$

-Preliminary analysis indicates there exists a cusp at b=b_c ≈ 0.86 when p is viewed in p-b space. This feature should be verified in phase diagram plot to be done in the future.

Conclusions/Outlook

- We have found that there exist two types of Gravitational Phase Transitions (GPTs) in the cosmological many body problem. One type of GPT takes place from mildly clustered to highly clustered regions, and the other type of GPT takes place from mildly clustered to lightly clustered regions.
- It is possible for the GPT to take place from mildly clustered to highly or lightly clustered regions but not vice-versa. Hence we have successfully demonstrated that hysteresis exists in the system of study.
- The system evolves through a "mixed phase" in the GPT, suggesting that application of the Clausius-Clapeyron equation is appropriate. We have a preliminary result for the slope of the coexistence curve in a more general p-b space, and our preliminary analysis suggests there exists a "cusp" at b=b_c.
- Future goal: incorporate information about nonanalyticities in p-b space into phase diagram.

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Confidence Intervals for Population Quantiles Based on Samples of Random Size

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Objective

To construct a distribution-free Confidence Interval for population quantiles when the sample size is a random variable.

Significance

The choice of the sample size plays an important role in many practical situations, but we often come across situations where the determination of the sample size is impossible for various reasons. In these situations, it is reasonable to consider that the sample size is a random variable.

Methodology

- The confidence coefficient was derived.
- Specific distributions for the sample size were selected.
- The confidence coefficients were numerically computed.
- Real life data was analyzed to validate the applicability of the obtained results.

Notation:

N : Random sample size $\pi_1(r, s; p)$: Confidence coefficient
 $P_N(n)$: $P(N = n)$ p : Order of population quantile
 $X_{i:N}$: i^{th} order statistic from a sample of random size N
 Note: $1 \leq r < s \leq N$, $0 < p < 1$

Confidence Coefficient

$$\pi_1(r, s; p) = \frac{1}{P(N \geq s)} \sum_{n=s}^{\infty} \sum_{i=r}^{s-1} \binom{n}{i} p^i (1-p)^{n-i} P_N(n)$$

Validation

A biometric data representing the duration of remission of 20 leukemia patients was analyzed to illustrate the applicability of the obtained confidence coefficient.

Duration of remission

1.013	1.034	1.109
1.169	1.266	1.509
1.533	1.563	1.716
1.929	1.965	2.061
2.344	2.546	2.626
2.778	2.951	3.413
4.118	5.136	

Confidence Intervals for the population quantile of order $p = 0.5$ with confidence coefficients ≥ 0.9 based on duration of remission data

p	(r, s)	$(X_{r:N}, X_{s:N})$	$\pi_1(r, s; p)$
0.5	(4,13)	(1.169, 2.344)	0.9064
	(5,14)	(1.266, 2.546)	0.9355
	(6,15)	(1.509, 2.626)	0.9272
	(7,17)	(1.533, 2.951)	0.9080
	(8,20)	(1.563, 5.136)	0.9037

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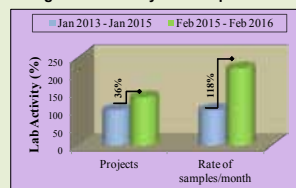


Abstract

The National Unit for Environmental Research and Services (NUERS) project-SRUL01/13 provides a variety of analytical services for different matrices in favor of researchers and graduate studies' students at Kuwait University. The sample types handled were various and the specific tasks varied with individual clients.

NUERS has provided services for 38 projects with a total of 3107 samples (at a rate of 259 samples per month) handled by the unit during the current year (Feb 2015-Feb 2016). The comparison with the earlier period (Jan 2013 –Jan 2015) shows that the lab activity of the current year increased by 36% in case of served projects, and by 118% in terms of rate of samples/month (Fig. 1).

Fig. 1 Productivity – A Comparison



Introduction



NUERS is located on the Khaldiya campus of Kuwait University (KH-33 Prof. Faiza Al-Kharafi Building).

The National Unit for Environmental Research and Services (NUERS) is a conceptual framework unit funded by Research Sector, Kuwait University. NUERS provides laboratory services to support environmental and hazardous substance site investigation/remediation projects, industrial quality control (QC), and other related activities.

The NUERS is a full-scale laboratory that offers its clients:

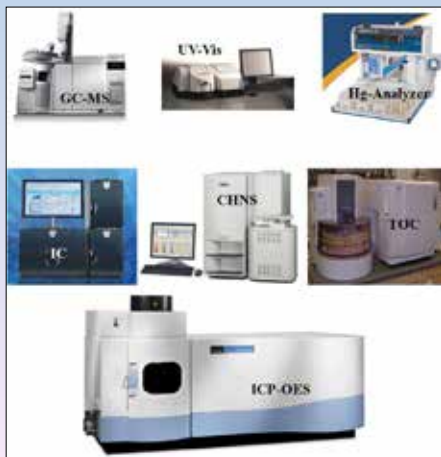
- ✓ Long-term, established service with a history of quality;
- ✓ ISO/IEC 17025:2005 Accreditation (Under recertification)
- ✓ Experienced, qualified staff operating state-of-the-art equipment

Objectives

- Be a world-class laboratory by delivering high class analytical services on Environmental field.
- Deliver value-added analytical services with speed and quality.
- Provide excellent, superior customer service backed up with a highly experienced staff of scientists.

Facilities

- ✓ Mercury Analyzer -Leeman Labs, inc-Hydra AA
- ✓ TOC Instrument – Shimadzu
- ✓ Ion Chromatograph y (IC)-Dionex ICS-5000
- ✓ Flow Injection Analyzer (FIA)-Lachat
- ✓ UV-Vis Spectrophotometer -Thermo Evolution
- ✓ Turbidity Meter-Cole Palmer
- ✓ ICP –OES PerkinElmer Optima 7300
- ✓ Electronic Titrator - Metrohm 775 Dosimat
- ✓ Automated Solvent Extraction-Dionex ASE
- ✓ Elemental Analyzer- CHNS Leco TruSpec
- ✓ Bomb Calorimeter-PARR—6400
- ✓ Sieve Shakers-Christison
- ✓ Gas Chromatograph (GC-MS)-Agilent 5975C
- ✓ Gas Chromatographs (GC-FID) -Agilent 7890 A & Thermo Finnigan
- ✓ Gas Chromatograph (GC-ECD) - Thermo Finnigan
- ✓ Spectrofluorometer - Jobin Yvon Fluoromax
- ✓ Freeze Drier-Labconco
- ✓ pH/Conductivity - Fischer Scientific
- ✓ Walk-in refrigerator and Freezer (7X4) sqm

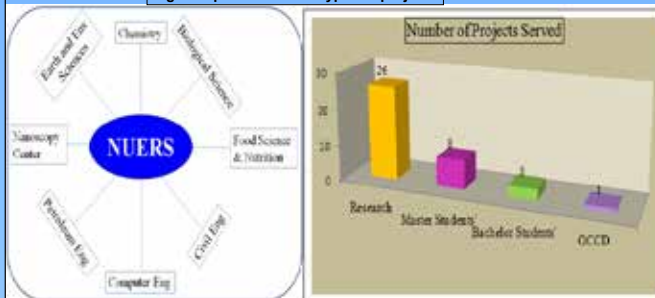


Analytical Tests

- % Lipids
- % Moisture
- AHP
- Alkalinity
- Ammonia
- CHNS
- Conductivity
- EOM
- Freeze Drying
- GC Analysis
- Hg Analysis
- Hydrometer
- Metal Analysis
- Microwave Extraction
- Nitrate/Nitrite
- Nitrite
- o-Phosphate
- Particle Size Analysis
- pH Analysis
- PHCs by UVF
- Pulverization
- Salinity
- Silicate
- TDS
- TOC
- Total Phosphorus
- TPH as HEM
- TPH by GC
- TSS
- Turbidity

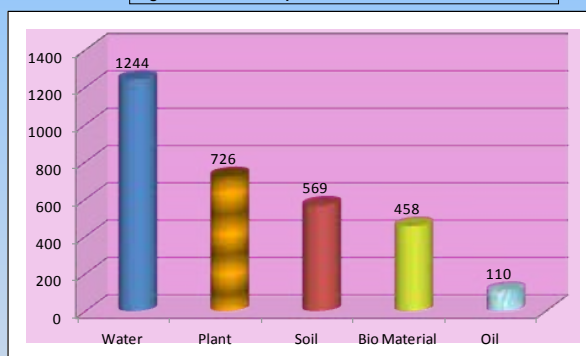
Performance

Fig. 2 Departments and Types of projects



- ✓ NUERS provided variety of analytical services for researchers from different departments
- ✓ Total Number of projects served during the current year : 38

Fig. 3 Number of Samples on different Matrices in 2015-2016



Conclusions

Activities	Numbers
Number of Samples received and analyzed in current year	3107
Number of Analyses performed (3107 in triplicates)	9321
Average Number of Samples per month	259
Average Number of Analyses per month	777
Number of papers published using NUERS facility	2
Number of Manuscripts submitted and under review	1
Number of Manuscripts Accepted for Publication	2
Number of Manuscripts under preparation	6
Number of completed Project Reports	3

Acknowledgements

- We thank and are indebted to our fellow colleagues and researchers from various colleges of Kuwait University.
- We wish to thank the **Research Sector (RS)** for their support and cooperation as well as their faith and confidence in the researchers and the technicians manning this facility.
- We earnestly hope that the kind of cooperation that we have got from Research Sector will continue in years to come.
- We wish to thank our efficient staff members Aswathy, Diana, Alberto, Melba, Harine and Alia for their immense hard work and contribution towards the overall successful activities of NUERS.

Contact Us:-

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Molecular modeling for bifurane derivatives with anticipated anticancer activities

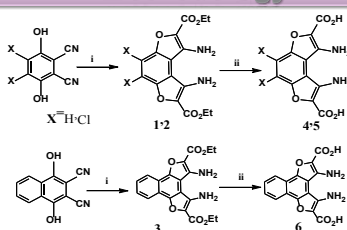
Basma Ghazal, Saad Makhseed* and Mona Shalaby

Chemistry Department, Faculty of Science, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait
Email: saad.makhseed@ku.edu.kw



One-pot method for the synthesis of novel benzo and naphtho bifuran derivatives with parallel conformations (both furane rings in mirror symmetry). The synthesized compounds have unique solvatochromism behavior in different solvent which is considerably required for environmental fluorescence sensor applications and exhibit promising biological activities. DFT and TD-DFT approaches were used to explore their electronic and biological properties. Virtual modeling studies of the target compounds showed higher binding affinity toward the CK2 kinase enzyme compared to the previously reported benzo-furane derivatives.

Methodology



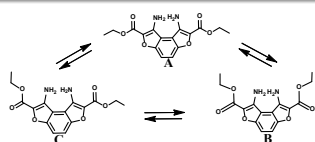
Scheme 1. Synthetic route to bifurane derivatives (1-6), Reagents and conditions: (i) acetone, base, reflux (ii) NaOH, HCl.

Quantum calculations:

DFT was successfully used for calculating the energy minimized structure and molecular orbitals. TD-DFT method was used to study the electronic absorption spectra. Geometry optimization and frequency calculations of the novel compounds (1-6) were calculated at the density functional B3LYP level with the 6-311+g(d,p) basis set. All the geometry optimization and TD-DFT calculations were performed using Gaussian 09W software. The TD-DFT calculations were calculated for 40 excited states. The final optimized structures were visualized using Gaussview version 5.0.9 and Chemcraft software packages.

Results

Conformations and rotational isomerism:



Scheme 2. A rotational isomerism hypothesized for 1, 2 and 3 compounds.

A rotational isomerism can be hypothesized for the synthesized compounds as shown in Scheme 2. The results of the quantum mechanical calculations on the conformers revealed that the lower energy conformer the compound 1 and 3 adapt the lowest energy conformer A and C. However, the compound 2 was found in conformer A as agreed with the experimentally determined X-ray.

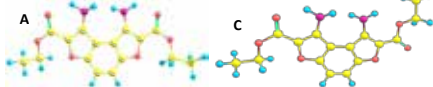


Figure 1. Conformation of A and C rotamers

Single crystal X-ray diffraction analysis

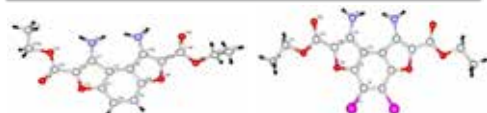


Figure 2. The ball and stick representation of 1 and 2.

Structure-activity relationship (SAR study)

Photodegradation results:

UV-vis absorption of 1-3 were measured in hexane, Acetonitrile, tetrahydrofuran, methanol and chloroform. Figure 4 shows the representative UV-vis absorption spectra of 1 as an example for unique solvent-dependent.

Molecular orbital analysis

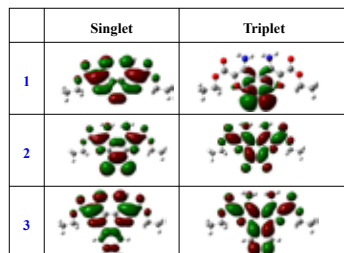


Figure 3. Frontier orbitals of 1, 2 and 3 in singlet and triplet states.

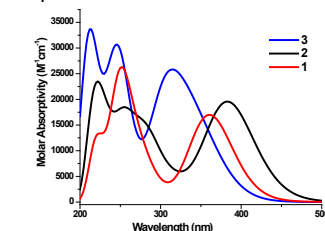


Figure 4. Simulated UV-Vis spectra of 1, 2 and 3 in gas phase.

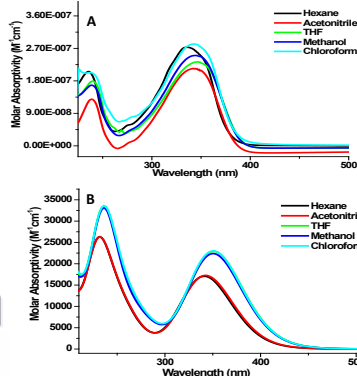


Figure 5. (A) Experimentally determined UV-Vis spectra of 1, 2 in different set of solvents. (B) TD-DFT predicted absorption spectra for 1, 2 and 3 at different solvent as calculated by B3lyp using 6-311+g(d,p).

Table 1. Energies of HOMO-LUMO, and energy gap (ΔE) at B3LYP/SDD, in eV.

ID	E_{HOMO} (eV)	energy (eV)			μ (Debye)	ω (Electrophilicity)
		E_{LUMO}	ΔE			
1	-32087.19	-6.41	-3.46	2.95	-4.93	-4.12
2	-57137.35	-6.38	-2.68	3.70	-4.53	-2.78
3	-36305.64	-6.20	-2.23	3.97	-4.22	-2.24

HOMO and LUMO energies, NPA charges, electrophilicity index and vibrational frequencies were calculated for the target compounds indicated that the charges distribution and electrophilicity index (ω) were used as descriptors to gain an insight into the activity of the synthesized compounds towards CK2 inhibitors. Electrophilicity index is a good tool for prediction of the inhibition activity. Reducing the energy gap, increase the reactivity and vice versa. The energies of the investigated compounds are summarized in (Table 1) and showed that compound 1 is the most potent compound (2.95 eV).

Molecular Modelling study:

Simulation procedure

Preparation of CK2 Enzyme and Ligands for docking study:

Based on the crystal structure of the CK2 α , the complex structures of compounds 1-6 were docked into CK2 α (PDB 1JWH) to evaluate their binding affinity. The target compounds were minimized before using B3LYP and saved as MDL MolFile (mol).

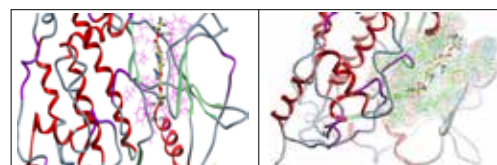


Figure 6. Ribbon representation interaction of compound 1 with CK2 binding site.

Virtual screening of the target compounds led to the identification of the most potent inhibitor toward CK2. Subsequent structural optimization resulted in the identification of a promising 4-benzoic acid derivatives (4-6). Both amino groups are likely to be essential for the interaction with Lys68 of CK2 active site and they bounded with the carbonyl oxygen of Val116. The two carboxylic groups exhibited high inhibitory activities as they formed a salt bridge with Lys68 and an additional water-mediated hydrogen bond. Compound 1 was approved to be the most potent one ($K_i=74$ kcal/mol).

Conclusion

In this work, benzo & naphtho bifurane derivatives have been synthesized using one pot synthesis method. The synthesized compounds had a promising biological activities. The photophysical properties of the targeted compounds and their solvatochromism behavior in different solvent system was evaluated to assess the photocatalytic activity of the target compounds. The molecular modeling study of the target compounds showed a good inhibition constant toward the CK2 enzyme leading to a highly potent anticancer agents.

References

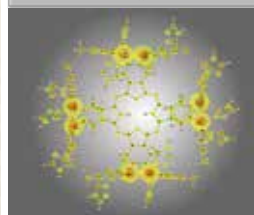
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Solar cell devices based on distorted and non-aggregated metal free phthalocyanine

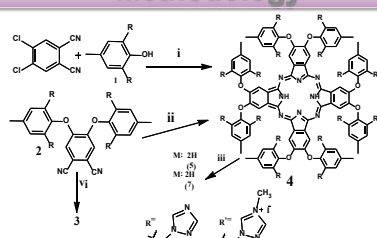
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Email: saad.makhseed@ku.edu.kw



The synthesis of metal free phthalocyanine (Pc) and its quaternarized salt has been described. UV-visible and ¹H-NMR spectroscopic analysis confirm that the non-aggregation behavior was effectively induced by the mutual steric effect of sixteen triazolyl moieties-containing phenoxy substituents. The 16 triazolyl moieties led to loss of symmetry and effect largely on the optoelectronic properties of the Pcs which is confirmed also by different theoretical methods. Cyclic voltammetry results was in synergy with theoretical results showed that quaternarized metal free Pc exhibited pronounced shifts to negative potentials for all processes. Therefore, it will oxidize more easily and reduce more difficulty than H₂Pc, together with the photophysical parameters, allowing fast charge transfer and enhanced the photovoltaic properties. The findings of these assessments can be applied for designing new photosynthetizers for dye synthesized solar cell (DSSC).

Methodology



Scheme 1. Synthetic pathway to metal free and non-ionic metal free; (i) CsF, DMF, 80 °C, 24 h; (ii) Mg(OBu)₂, BuOH, I₂, reflux, 3 h (iii) TsOH, THF, rt, overnight; (iv) DMF, CH₃I, 80 °C, 24 h.

Quantum calculations:

DFT studies had been used to calculate the energy minimized structure, electronic distribution, molecular orbitals and electronic absorption spectra for metal free Pc complex and its quaternarized salt. Geometrical optimizations of the complexes were calculated at the density functional B3LYP level with the LANL2DZ basis set. All the calculations were performed by using the Gaussian 09 program.

Results

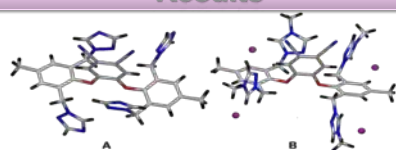


Figure 1 : Molecular structures derived from single crystal X-ray diffraction data of phthalonitrile precursors (A) and its quaternarized salt (B). Color code: red - oxygen; blue - nitrogen; light gray - carbon; purple - Fluorine; black - hydrogen.

Single crystal X-ray diffraction analysis and geometrical optimization results for metal free complexes

Geometry optimization calculations at the theoretical DFT level were evaluated to rationalize the relationship between the observed spectral features and the molecular structures of the prepared complexes.

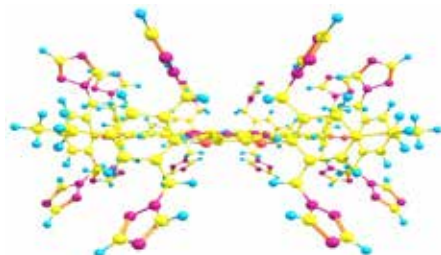


Figure 2: the optimized structure H₂Pc showing the perpendicular orientation of chlorine atoms with respect to Pc core as calculated by B3LYP SDD.

As observed from the optimization of the metal free (Figure 2), the atomic coordination of the optimized geometry revealed that the compound is stabilized in C₁ symmetry due to the free rotation of methylene protons. This loss of symmetry is due to the distorted core and free rotation in the attached triazolyl moieties above and below the π-π* of phenoxy units. Which is in excellent agreement with the crystallographic data observed in Figure 3.

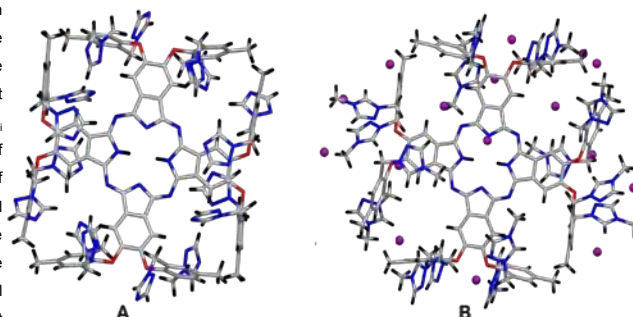


Figure 3: Molecular structures derived from single crystal X-ray diffraction data of phthalonitrile precursors (A) and its quaternarized salt (B). Color code: red - oxygen; blue - nitrogen; dark gray - carbon; green - Fluorine; light gray - hydrogen.

Molecular orbital analysis and cyclic voltammetry data

Based on the spectral studies, the HOMO-LUMO gap of the quaternarized H₂Pc-Mel complex is smaller than the H₂Pc as approved by the CV results explained below. Moreover, both theoretical and electrochemical data showed that the energy level of these compounds have sufficiently energetic LUMO levels and well matched HOMO levels to be act as a superior dye in different photovoltaic systems applicable in DSSC.

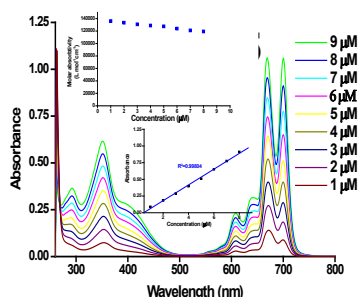


Figure 4. UV-Vis spectra of H₂Pc at different concentrations ranging from 1 to 9 μM, inset: Dependence of the molar absorptivity at λ_{max} on the concentration in DMF that shows the absence of aggregation. The U

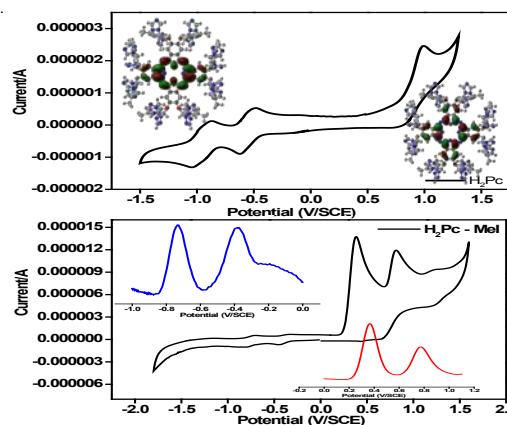


Figure 5. cyclic voltammetry of H₂Pc (A) and its quaternarized salt H₂Pc-Mel (B), inset: oxidation and reduction peak and their molecular distribution shape.

Conclusion

The synthesis and characterization of novel phthalocyanine complexes (Pcs) containing sixteen triazolyl moieties has been reported. The synthesized complexes show a little distortion in solution as confirmed by ¹H-NMR and UV-vis spectroscopic techniques. The electronic properties achieved by electrochemical analysis were agreeable with that one gained by the theoretical method where the energy level facilitate the transfer of electrons into the large band gap semiconductor. Such promising results verify that the target complexes can be considered as a potent dyes for highly efficient dye synthesized solar cell system.

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Scientific Research
(KISR)*



In Situ Sequential Monitoring of EIS Response from OPC paste with Volcanic Ash

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¹Construction and Building Materials Program, Kuwait Institute for Scientific Research, ²Civil and Environmental Engineering Department, Massachusetts Institute of Technology (MIT)
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Abstract

New information on cement pastes (OPC) containing different replacement with Saudi Volcanic Ash (VA) was in situ studied with electrochemical impedance spectroscopy (EIS). The VA content as neat cement paste was sequentially measured with EIS during the early stages of hydration for up to 3 hours. The effect of VA addition for hardened cement paste at (10%, 20% 30% 40% and 50%) was also evaluated and compared with respect to different VA particle sizes ranging between 6, 12, and 17 micron. EIS Impedance data for VA/OPC at room temperature are reported as a function of hydration time. It has been found that the Nyquist impedance spectrum was related to the degree of hydration and allowed us to characterize the plain and blended pastes. The electrical properties of the hydration products located in the solid-solution interface and were useful to distinguish the role of inert and VA admixtures present in the cement matrix.

Introduction

- New information on cement pastes (OPC) containing different replacement with Saudi Volcanic Ash (VA) was in situ studied with electrochemical impedance spectroscopy (EIS).
- AC Impedance spectroscopy EIS is now gaining favor as an investigative technique for monitoring the development of cement microstructure.
- During hydration, the volume and connectivity of the pore network, as well as the conductivity of the ionic pore solution, changes with time.
- Using the electrical conductivity of EIS as a tool to monitor microstructural changes with time and degree of hydration, allows the use of the EIS measurement to be made in situ as the cement hydrates by showing the compositional dependence of the complex impedance of the cement paste that could be extended to (i.e. mortar and aggregate water systems and concrete admixtures) even while still in the aqueous state.
- At present, only limited data are available on the complex impedance response of cementitious system during the very early stages of hydration (i.e. before setting) and research works only limited to neat cement pastes.

Objectives

- Presenting the viability of EIS to be used as NDT and non-invasive technique to analyze substitution of paste/mortars containing different amounts of Volcanic Ash, and to assess the VA effects in the microstructure of cement and neat cement paste.
- The current study examines the effect hydration product formation along with the influence of volcanic ash on the continuous and discontinuous pore formation.

Materials and Experimental Methods

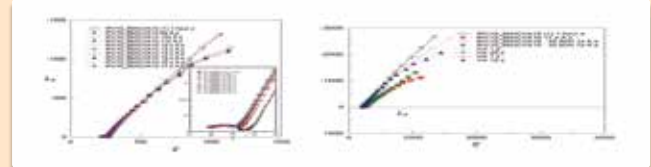
- The VA content as neat cement paste was sequentially measured with EIS during the early stages of hydration for up to 3 hours.
- An in situ experimental evaluation of finely ground volcanic VA addition to hardened cement paste at (10%, 20%) was performed and compared with respect to three different VA particle sizes of 6, 14, and 17 micron. EIS Impedance data for VA/OPC at room temperature are reported as a function of hydration time. The samples were prepared as per ASTM C 305. A constant water to cement ratio of 0.45 was used for all the combinations. Higher water to cement (w/c) ratio was used to allow sufficient water to react with the cement to form hydration products.
- The cement paste samples were prepared using deionized water and drawn into a syringe-like cylindrical tube (internal diameter of 2 cm) with two cylindrical graphite electrode positioned at a fixed distance 4 cm on each side of the cylinder to minimize the entrapped air.
- The EIS experiment was carried out using a Solartron AC impedance instrument over a frequency ranging from 2 MHz to 0.1 Hz. The EIS responses were recorded for every 2 minutes up to 1 hr. and continued every 30 minute up to 2 hrs.
- Three equivalent circuit models were used to analyze the developing microstructure.
- As soon as the water comes in contact with the cement paste the hydration process is initiated. As the hydration process progresses the free water is consumed in forming the hydration products along with formation of pores.
- The models differentiates free water from the solid component, which is the hydration product. As the hydration products are formed, pore formation inside the hydrated gel is forming as well, eventually the pores can be classified as continuous and discontinuous pores.
- Furthermore the particle size of the volcanic ash is also considered on the equivalent circuit models for the hydrating cement paste.



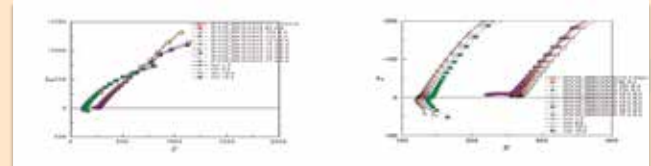
Results and Discussions

IPV10% for 6 micron taken every 2 minutes for one hour initial setting time with 90% OPC

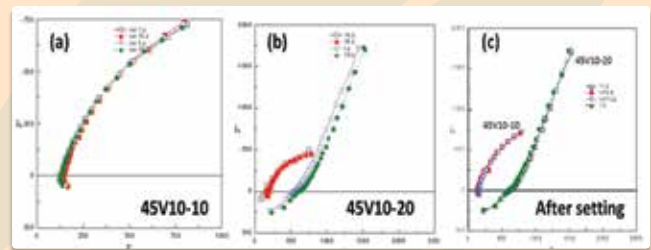
IP10-VA 6 micron at 2 minute run up to 1 hr
IP10-VA 6 micron at 30 minute run up to 2 hr
IP20-VA 6 micron at 2 minute run up to 1 hr
IP20-VA 6 micron at 30 minute run up to 2 hrs



IP10-VA14 compared to IP10-VA6 i.e. 14 micron vs, 6 micron during early stage hydration taken every 2 minutes for 1 hour



EIS response comparison of EIS graphs for 45V10-14 and 45V10-17 after final setting.



Conclusions

- A major criticism of EIS is that the observed response may not be readily interpretable in terms of a unique equivalent electrical circuit.
- Several equivalent circuits involving different RC values could be designed to give the same overall electrical response.
- As pastes continuously hydrate, it is very difficult to calculate meaningful capacitance and resistance values for different microstructural features.
- Unlike MIP and NAD methods, EIS measurements are advantageous because they are non-destructive and can be performed quickly and automatically at any time during the hydration reaction.
- EIS can characterize the degree of hydration of OPC at early ages, complementing mechanical properties measurement.

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Acknowledgements

The Research team wish to acknowledge and appreciate the contributions of KFAS and their support during the course of collaboration with Massachusetts Institute of Technology (MIT), Civil and environmental engineering department.

Study the Delay Effect of Using Flaxseed on the Production Performance of Laying Hens.

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Abstract

One of the most important objectives of the poultry producers is to obtain the highest profit and lowest cost and that could occur from selling omega-3 enriched eggs. However, the producers could have the desire to shift the production of omega-3 to standard eggs and therefore, it is important to find out whether or not termination of adding flaxseed to produce omega-3 enriched eggs will have any negative effect on the eventual production of standard eggs. The main objectives of the current research activity are: 1 - studying the delay effect of stop using flaxseed on production performance of laying hens. 2 - Studying the delayed effect of stop using flaxseed on the level of Omega-3 in eggs. The results show that there were no significant differences ($P>0.05$) on egg production, egg mass, egg weight, feed efficiency and food consumption between all the treatments at all ages studied. It was concluded that termination of using the flaxseed in the diet of laying hens does not have any negative impact on eventual production performance.

Abstract

One of the most important objectives of the poultry producers is to obtain the highest profit and lowest cost and that could occur from selling omega-3 enriched eggs. However, the producers could have the desire to shift the production of omega-3 to standard eggs and therefore, it is important to find out whether or not termination of adding flaxseed to produce omega-3 enriched eggs will have any negative effect on the eventual production of standard eggs. The main objectives of the current research activity are: 1 - studying the delay effect of stop using flaxseed on production performance of laying hens. 2 - Studying the delayed effect of stop using flaxseed on the level of Omega-3 in eggs. The results show that there were no significant differences ($P>0.05$) on egg production, egg mass, egg weight, feed efficiency and food consumption between all the treatments at all ages studied. It was concluded that termination of using the flaxseed in the diet of laying hens does not have any negative impact on eventual production performance.

Introduction

Poultry industry is one of the important industries in the State of Kuwait but yet they face a serious competition with imported products. Therefore, we note that this industry moves toward improving the production performance of the laying hens and produces unique and distinctive products, so it can compete with the imported products. One of the most important unique products are eggs with high-quality essential fatty acids, which cannot be manufactured by the body and, therefore, must be obtained through diet. We can produce the eggs which are rich in omega-3 by adding flaxseed to laying hens diet. However, adding flaxseed would increase the cost of the diet. One of the most important objectives of the poultry producers is to obtain the highest profit and lowest cost and that could occur from selling omega-3 enriched eggs. However, the producers could have the desire to shift the production of omega-3 to standard eggs and therefore, it is important to find out whether or not termination of adding flaxseed to produce omega-3 enriched eggs will have any negative effect on the eventual production of standard eggs. This activity is one of the most important activities which will benefit the poultry sector in Kuwait, since it will answer the concern of the producers.

Methods

Production performance including percent of egg production, egg weight, feed consumption, egg mass and feed efficiency were also measured following the termination of adding flaxseed in the diet of laying hens. This was done to determine the effect of stopping feeding flaxseed on eventual production performance. The experiment started when the flaxseed treatments ended, and hens were 65 weeks of age. The total number of laying hens was 1944. The laying hens were raised in 27 pens each pen was considered as one replicate. Each pen was treated as an experimental unit (n) with 27 experimental units for each treatment. Each pen had 24 laying hens. There were three different treatment groups, the first group received no flaxseed in the diet and was considered as the control group, the second group received 10 % of flaxseed and the third group received 15 % of flaxseed.

Finding

The results show that there were no significant differences ($P>0.05$) on egg production, egg mass, egg weight, feed efficiency and food consumption between all the treatments at all ages studied. It was concluded that termination of using the flaxseed in the diet of laying hens does not have any negative impact on eventual production performance.

Table 1. Effect of Feeding Different Levels of Flaxseed after 36 weeks of Treatment on Levels of Omega-3 and Omega-6 Fatty Acids

Parameters	Level s of Flaxseed		
	Control 0 %	10 % Flaxseed	15 % Flaxseed
Amount of omega-3 (mg)	43.31 ± 10.91a	129.59 ± 48.96b	119.73 ± 28.75b
Amount of omega-6 (mg)	499.57 ± 81.73a	599.55 ± 74.57b	487.09 ± 80.20b
Ratio of omega-6 to omega-3	11.76 ± 1.66a	4.35 ± 0.37b	4.13 ± 0.45b

Table 2. Effect of Stop Feeding Different Levels of Flaxseed after 17 wks of Stop Adding the Treatment on Levels of Omega-3 and Omega-6 Fatty Acids.

Parameters	Level s of Flaxseed		
	Control 0 %	10 % Flaxseed	15 % Flaxseed
Amount of omega-3 (mg)	17.17 ± 4.33a	19.71 ± 4.57a	22.14 ± 4.56a
Amount of omega-6 (mg)	201.46 ± 44.64a	233.34 ± 40.64a	262.38 ± 53.67a
Ratio of omega-6 to omega-3	11.77 ± 0.58a	11.79 ± 0.52a	11.86 ± 0.60a

Conclusion

The activity was completed successfully and important results that can be utilized by the poultry farms in Kuwait.

- This activity was conducted to study whether or not stop using flaxseed in the diet of laying hens will affect the production performance of these hens.
- The results show that there were no significant differences ($P>0.05$) on egg production, egg mass, egg weight, feed efficiency and food consumption between all the treatments at all ages studied. It was concluded that termination of using the flaxseed in the diet of laying hens does not have any negative impact on eventual production performance.

Acknowledgments

The project team would like to thank the management of the Kuwait Institute for Scientific Research (KISR) for their financial support and their continuous interest in the project.



Vibration Analysis of Beams Using Finite Element Method

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Abstract

Finite element method has been employed to carry out free vibration analysis of beams with varying boundary conditions. Natural frequencies and mode shapes have been obtained very accurately. It has been shown that natural frequencies of lower modes converge faster compared to that of the higher modes.

Introduction

Vibration analysis is an important part of the structural design of mechanical components, aerospace structures, buildings, bridges etc. Structures are designed against dynamic loading by properly designing the natural frequency of the structures such that they are not matching with external forcing frequency. The natural frequency of the structures are obtained from free vibration analysis [1-4]. In most practical cases the structures are designed with complex shapes and, hence it is not easy solve the free vibration problem to obtain the natural frequency. The approximate, finite element method is commonly employed by the design engineers to obtain the natural frequencies of the structures. In this paper, free vibration analysis of beams with different boundary conditions are presented.

Objectives

- To carry out free vibration analysis of beams using the finite element method.
- To carry out error analysis of the approximate natural frequencies obtained using the finite element method.

Free Vibration Using the Finite Element Method

Undamped free vibration problem can be mathematically expressed as an eigenvalue problem as given below

$$([K] - \omega^2[M])\{u\} = 0 \quad (1)$$

where $[K]$ is the stiffness matrix, $[M]$ is the mass matrix, and ω is the eigenvalue (natural frequency of the structure) and $\{u\}$ is the eigenvector (mode shapes). In finite element method the stiffness and mass matrices are obtained approximately. In this paper, two noded classical Euler Bernoulli beam element model is used to model the free vibration problem.

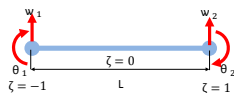


Fig1: The two-noded Euler Bernoulli beam element

Fig1 shows the two noded Euler Bernoulli finite element beam model with two degrees of freedom at each node. Displacement within the element can be obtained as,

$$w = N_1\theta_1 + N_2\theta_2 + N_3\theta_3 + N_4\theta_4 \quad (2)$$

Where the shape functions are given by,

$$N_1 = \frac{1}{4}[2 + \zeta(\zeta^2 - 3)]; N_2 = \frac{1}{8}[(\zeta + 1)(\zeta - 1)^2];$$

$$N_3 = \frac{1}{4}[2 - \zeta(\zeta^2 - 3)]; N_4 = \frac{1}{8}[(\zeta - 1)(\zeta + 1)^2]$$

The element strain displacement matrix can be obtained as,

$$\{\epsilon\} = -\frac{d^2w}{dx^2} = \frac{1}{L^2} [6\zeta L(3\zeta - 1) - 6\zeta L(3\zeta + 1)] = [B][d] \quad (3)$$

here ζ is the non-dimensional parameter and L is the element length

The stiffness matrix $[K]$ can be obtained using the variational principle from the equation

$$[K] = \int_{-1}^1 [B]^T [D] [B] d\Omega \quad (4)$$

$$[K] = \frac{EI}{L^3} \begin{bmatrix} 12 & 6L & -12 & 6L \\ 6L & 4L^2 & -6L & 2L^2 \\ -12 & -6L & 12 & -6L \\ 6L & 2L^2 & -6L & 4L^2 \end{bmatrix} \quad (5)$$

Here the rigidity matrix $[D]=EI$, where E is the Young's modulus of elasticity and I is the moment of inertia. The mass matrix is a consistent discrete representation of continuous mass distribution defined as

$$[M] = \int \rho [N]^T [N] dV \quad (6)$$

$$[M] = \frac{\rho AL}{2} \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad (7)$$

Analysis and Results

Free vibration analysis of beams with various boundary conditions have been carried out using in-house finite element program. The finite element natural frequencies for the first four modes have been presented in the Table 1. The mode shapes are presented in Figures 2, 4 and 6. The beams have been described using varying number of finite elements and the convergence study has been carried out. It has been observed that as the number of finite element increases the accuracy of the predicted finite element frequency increases. Further more, the lower natural frequencies converges faster than compared to the higher modes. Convergence of eigenvalues of the are presented in figures 3, 5 and 7.

Table1: Natural frequencies for the first four modes

Natural Frequencies [Rad/s]			
Mode	Fixed-Free Beam	Fixed-Fixed Beam	Simply Supported Beam
1	1.0261	41.2902	8.0512
2	39.3825	3.0524	1.2574
3	2.9787	1.1253	6.1219
4	1.0878	2.9120	1.8364

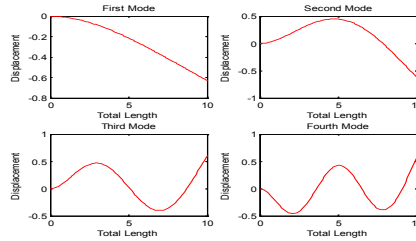


Fig2: Mode Shapes of the first four Natural Frequencies of the Fixed-Free Beam for 100 elements.

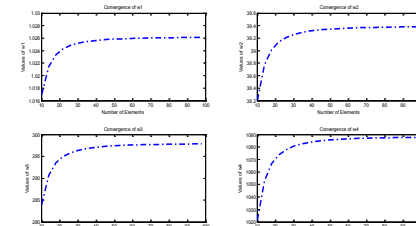


Fig3: Convergence of the first four natural frequencies of the Fixed-Free Beam for 100 elements.

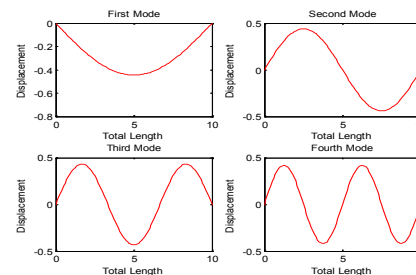


Fig4: Mode Shapes of the first four Natural Frequencies of the Simply Supported Beam for 100 elements.

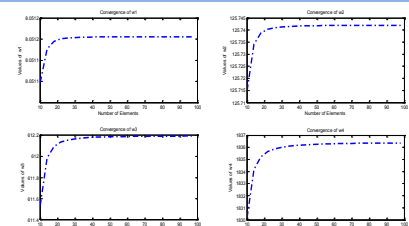


Fig5: Convergence of the first four natural frequencies of the Simply Supported Beam for 100 elements

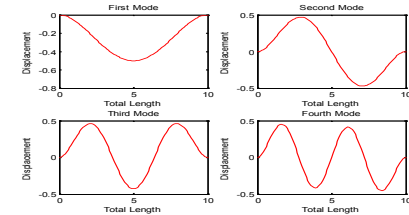


Fig6: Mode Shapes of the first four Natural Frequencies of the Fixed-Fixed Beam for 100 elements.

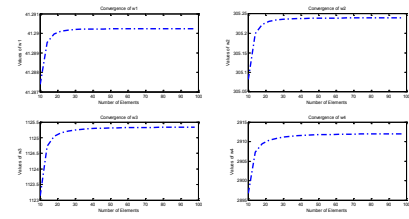


Fig7: Convergence of the first four natural frequencies of the Fixed-Fixed Beam for 100 elements.

Conclusion

Finite element analysis has been employed using Euler Bernoulli beam element to predict the natural frequency of the beams with varying boundary conditions. It has been observed that natural frequency of lower modes converge faster compared to the higher modes.

Acknowledgement

This work was carried out at KISR as part of the summer training under the guidance of Dr. Jafarali Parol. We would like to thank KISR for all the arrangements for the work.

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Embodied Carbon of Kuwait's Built Environment

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Abstract

This project is analyzing the sustainability and embodied carbon of Kuwait's Built Environment. The current building materials used in existing typical buildings of a Kuwaiti neighborhood have been investigated and the global warming potential was calculated. Three scenarios were considered to reduce the embodied carbon by using efficient materials with low carbon and the results indicate savings of 250 kgCO₂/m² and more than 300 kgCO₂/m² when using fly ash replacement and traditional architecture with rammed earth, accordingly.

Introduction

- The building sector is responsible for 40% of global energy consumption and 30% of anthropogenic greenhouse gas emissions (UNEP, 2009). Whole life cycle emissions include not only operational carbon due to the use phase of the building, but also embodied carbon due to the rest of its lifecycle: material extraction, transport to the site, construction and demolition. Recent innovations have helped reduce the operational carbon, but a lack of knowledge hinders the reduction of embodied carbon.
- Moreover, as the Intergovernmental Panel on Climate Change (IPCC, 2014) warns, carbon reduction is needed in the next decade if we want to avoid extreme climate catastrophes. With the ongoing population growth and consequentially the increasing building need, decreasing embodied carbon is imperative. Indeed, embodied carbon emissions are immediate and irreversible, unlike operation carbon that can improve in the future with energy efficiency measures.

Objectives

- This project is analyzing the sustainability and embodied carbon of the Kuwait's built environment. Current sustainability assessment methods include the Estidama Pearl System and the Qatar Sustainability Assessment System (QSAS), but there is a lack of benchmarking in terms of embodied carbon.
- Therefore, this research looks at different alternatives to the current construction methodologies, such as volcanic ash replacement in concrete or rammed earth structural systems. The impact on the embodied carbon at a neighborhood scale is evaluated for the different options. Simulations are performed with the Urban Modeling interface (UMI) tool, which give us a distribution of the embodied carbon of buildings for the different design options.

Approach

- The project approach is focusing on identifying the following:
 - The embodied carbon of a Kuwaiti buildings and neighborhood.
 - Methods to lower the embodied carbon of new buildings and neighborhood design.



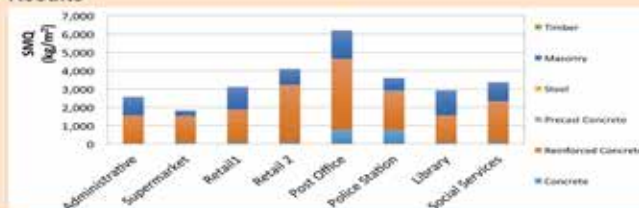
Two key variables are analyzed: Structural Material Quantities (SMQ, kg_{material} or kg_m per functional unit (often m²)), and Embodied Carbon Coefficients (ECC, kg of CO₂e (kg_{CO2e}) per kg of material (kg_m)). Multiplying the two variables gives the Global Warming Potential (GWP, kg_{CO2e}/m²).

$$\sum_{i=1}^n SMQ_i \left(1 + \frac{W_i}{100}\right) ECC_i$$

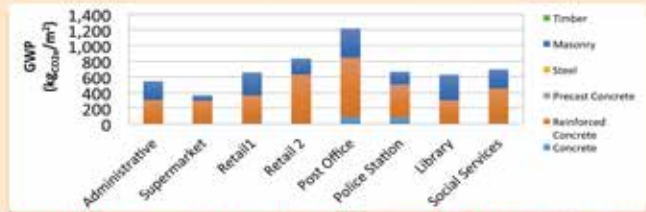
↓
 Spreadsheets
 Plans of Kuwaiti villas
 Kuwait visit

↓
 ICE Database or EcoInvent
 Continuity of Thesis El Mostafa
 World Building Council Middle East

Results



Material	ECC (kgCO ₂ e/kg)	Source
Cement Block	0.22	ICE Bath
Cement Mortar	0.89	World Building Council (Egypt)
Concrete Block	0.19	Mayce El Mostafa's thesis
Concrete Block Aerated	0.17	EcoInvent
Concrete Reinforced Dense	0.14	ICE Bath
Sandlime Brick	0.15	EcoInvent (DE)
Fiberglass Rigid	8.1	ICE Bath
XPS Board	3.29	ICE Bath
Steel Rebar	1.4	ICE Bath
Ceramic Tile	0.89	EcoInvent (GLO)
Sand Base	0.012	EcoInvent (GLO)
Masonry	0.17	EcoInvent (GLO)
Plaster	0.9	EcoInvent (CH)
Sealing	0.29 kgCO ₂ e/m	EcoInvent (RER)
Asphalts	0.26	EcoInvent (RoW)
Floorings	3.19	ICE Bath
Wood	.031	ICE Bath



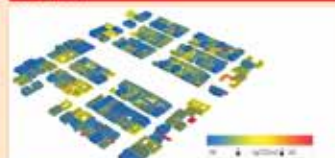
SCENARIO 1: CURRENT PERFORMANCE



SCENARIO 2: RETROFITTING AND ENERGY UPGRADES TO CURRENT BUILDING STOCK



SCENARIO 3: NEW DESIGN (current technologies)



SCENARIO 4: NEW DESIGN (more radical design ideas)



Impacts

- Two Strategies to lower embodied carbon
- Material efficiency
- Low carbon materials



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 International Panel for Climate Change (IPCC) (2007). Climate Change 4th Assessment Report. Summary for Policy Makers. Valencia, Spain: International Panel for Climate Change (IPCC). Retrieved December 1, 2013, from <http://www.ipcc.ch>

Establishment of Kuwait's Building Design and Construction Practice

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Abstract

This project is focusing on the Establishment of Kuwait's Building Design and Construction Practice by assessing the current codes and standard used by design offices, architects and contractors to explore their strength and weaknesses. A comprehensive survey was launched to fifty design offices and contractors covering participants experience, code and regulation usage, building materials and system usage, and end life of building stage. The findings of this research work indicate the need for clear guidelines and codes in design and construction practice including green building system guideline for the new cities in Kuwait.

Introduction

- It is important, in building construction field, to highlight the close relationship between design phase and construction phase, in which several operational tasks are performed to achieve approved and reliable constructed building quality using managed guidelines as codes or building regulations.
- The building regulations and codes in Kuwait have been noticed for its lack of use and implementation quality among the architectural firms, engineering consultants and contractor companies. This leads to poor practice and unsustainable buildings in



The team also conducted several interviews with key persons in Kuwait Municipality, contracting companies, and private sectors. These interviews gave the opportunity to understand the codes/standards development in the country and its procedures during implementation phase. An open discussion event was successfully held on 25th of March 2014 at KISR with MIT team to meet the private sectors and discuss the design and construction practice in Kuwait.



Objectives

- The research aims to evaluate the level of design practice implemented by architects, designers and engineers, as well as building construction implementation that are supervised by engineers and contractors.
- Highlight weaknesses and strengths of current local building codes/standards and develop a list of recommendations to enhance the quality of the regulations which will help in creating sustainable built environment in Kuwait.

Approach

- To achieve the research the approach research objective, included collecting data and information for building guidelines/codes and regulations, interviewing key persons, and launching an online survey using Monkey Survey.

Collecting Information	Codes and Standards Analysis	Interviews and Case Studies	Analysis and Evaluation of Current Codes and Standards	Survey (Theory vs. Practice)	Final Analysis	Reporting
Clarity Land Requirements and Procedures	Strengths and Weaknesses	Study Coding History to Highlighting Main Problems	Local Codes	Design Firms	Company Profile	Summary Report
Design Code/Process	Building's Applied Code Evaluation	Highlighting Main Problems	International Codes and Standards	Real Estate	Experience	Power Data Presentation
Building Codes	Regional and International Codes and Standards			Construction Companies	Education & Interest edge	
Structural Standards					General Information	
Electrical Standards					Building Standards	
MEP Requirements					Materials & Equip. Types	
Energy Requirements					Practice Profile	
Health Requirements					Equip. Durability & End Life	
Design Production Process						
Design Production Process						

Results

Data collection included local and international building codes, regulations and standards used by design firms, engineering consultants and contractors. The purpose of this is to understand the relationship between design phase and construction phase management and implementation quality by highlighting the weaknesses and strengths of current local codes /standards.



The survey entitled: "Building Design and Construction Practice in Kuwait" using Monkey Survey web site was conducted to establish a clear knowledge about common practice building design and construction. The survey included company profiles, participants experience/ education and knowledge, code and regulation usage, building materials and system usage, practice profile, and end life of building stage. This was launched on March 1st, 2015 to architects, engineers and contractors in Kuwait via emails, personal contacts and site visits. The survey was designed in both Arabic and English language. By June 30th 2015, the survey responds reached 50 (10 in Arabic and 40 in English).



The survey results indicate 50% of respondent are not aware of the zoning code of the country and more than 70% of them do not have its manual guidebook. Also, more than 60% of respondents do not use international neither local standards. The survey results show that most of respondents were working on villas and governmental building types, in which 80% of them were aware of the Kuwait building regulation and implement it by 88%. For following any sustainable system method in the design or construction phases, the respondents were negative by 82% due to lack of client's awareness and interest.

Conclusion

- The need for clear guidelines in design and construction codes, standards and regulations.
- The local building codes and regulations are set by several authorities like Kuwait Municipality, Ministry of Electricity and Water (MEW), Public Industry Authority, etc...
- There are many international standards used in design firms due to the lack of local standard or authority guidance.
- Since sustainability is beginning to take root in Middle East business, a green building system guideline is indeed essential need and should be considered as new building code in the region.



Effect of Volcanic Ash on the Microstructural Development of Hydrated Cement Paste

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Abstract

Modifications in the pore structure and microstructure have been studied on blended cement paste incorporating regionally available mineral admixture in the form of volcanic ash using different characterization techniques like XRD, SEM, optical microscopy and FT-IR.

Introduction

The deterioration of concrete structures in the existing hot and cold climates of Kuwait along with the chloride and sulphate attack has opened a wide range opportunity for the researchers on the usage of Pozzolanic materials^[1] in concrete construction, particularly as the Gulf region is nourished with vast deposits of natural Pozzolana like volcanic ash(VA)^[2].

Objectives

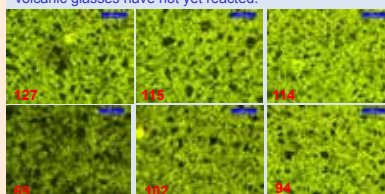
To study the effect of incorporation of different percentages of volcanic ash on the microstructural properties of hydrated cement paste with an objective to determine the optimum percentage of VA that can be added to cement paste to obtain the maximum benefits.

Methods

Locally available ordinary Portland cement and volcanic ash samples of average size 20 μm obtained from Saudi Arabia was used in this study. The cement paste study was carried out on control sample and with five progressive increments of VA replacement percentages, from 10-50% and at four different w/c ratios, 0.25, 0.35, 0.45, and 0.55, totalling 24 mixes. Characterization of volcanic ash was carried out as per ASTM C 648. The microstructural analysis was carried out using optical microscopy, SEM, FT-IR, and XRD and the tests were done with samples of all w/c ratio after 28 and 90 days of curing. Particle size distribution analysis was conducted on OPC and VA and the Mean particle size for OPC and VA was found to be 21.58 μm and 23.12 μm respectively.

Results

Optical fluorescence microscopy shows the apparent capillary porosity by use of fluorescent light of the 1 and 14 days old samples (Fig.1). Paste with 100% OPC show the densest texture after 14 days. The most porous paste are seen in samples with 30-50% volcanic ash replacement. After 14 days, samples with volcanic ash are generally more porous than the OPC indicates that the volcanic glasses have not yet reacted.



100% OPC 70% OPC-30% VA 50% OPC-50% VA
Figure 1. Paste observed in fluorescent light. The images in the upper row represents 1 day old paste, the lower row 14 days old pastes. (The scale goes from 0 being 100% dense to 255 being 100% porosity).

XRD analysis shows portlandite as the major phase present in both 28 days and 90 days aged samples as reported by other researchers^[3] (Fig. 2). The phases identified after 90 days of curing (Fig. 2b) is same as in 28 days samples (Fig. 2a). Ettringite ($\text{Ca}_6\text{Al}_2(\text{SO}_4)_3(\text{OH})_{12} \cdot 26\text{H}_2\text{O}$),

brownmillerite ($\text{Ca}_2(\text{Al},\text{Fe})_2\text{O}_7$), alite, belite and anorthite ($\text{CaAl}_2\text{Si}_2\text{O}_8$) were identified in minor amounts along with the major phases of C-S-H and portlandite in both 28 & 90 days samples. As expected, samples with more than 20% volcanic ash (VA) content shows a minor peak of anorthite at 27.7° (2 θ). This shows that some excess VA remains unreacted in the sample after 90 days of curing. SEM analysis shows various hydration products like C-S-H, C-H, CaCO_3 and ettringite.

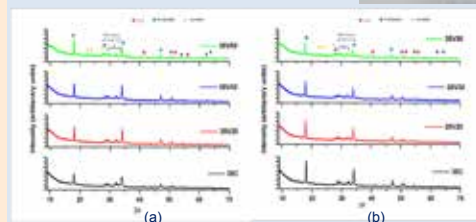


Figure 2. X-ray pattern of 35C, 35V20, 35V30, and 35V50 after (a) 28 & (b) 90 days

Samples after 90 days of curing showed much denser morphological structure than 28 days of curing with either gel or reticular type of C-S-H morphology. The amount of ettringite needles decreased tremendously and amount of C-H crystals increased in general after 90 days of aging (Fig. 3).

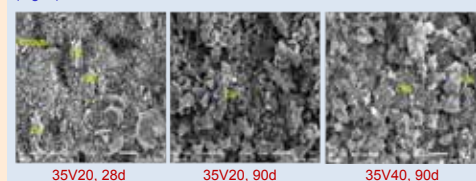


Figure 3. Microstructure of hardened cement paste samples of 0.35 w/c ratio at 28 and 90 days curing with varying VA content.

In FT-IR analysis hydration of the silicate phases causes a shift in the band ν_3 (SiO_4) from 924 cm^{-1} (anhydrous) to 977 cm^{-1} (25V10) over 90 days which is almost same as we have seen after 28 days (25V10, 976 cm^{-1}) (Fig. 4a). The sharp peaks at 3640 cm^{-1} (25C) and 3638 cm^{-1} (25V50) shows the presence of OH stretching frequency of portlandite.

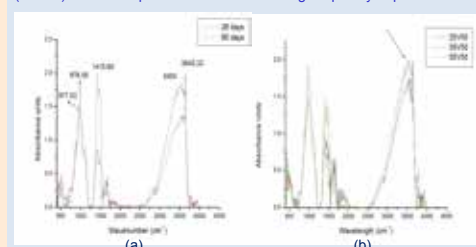


Figure 4. FT-IR spectra of (a) 25V10 samples after 28 days and 90 days of curing (b) 25V50, 35V50 & 55V50 after 90 days of curing.

The peaks at 1409 cm^{-1} and 1483 cm^{-1} due to the formation of carbonated products which are much less in 90 days samples when comparing with 28 days samples. The relative peak intensity ratio of the broad peak in the region $3000\text{-}3650\text{ cm}^{-1}$ (C-S-H and ettringite) and OH stretching frequency of portlandite at 3643 cm^{-1} is more in samples without VA. With increase in VA content this ratio becomes equal in 90 days samples (Fig. 4b). This is due to the conversion of C-H to C-S-H by pozzolanic reaction with VA. The effect was less predominant in 28 days old samples. This indicates that pozzolanic reaction takes place at later ages with the addition of VA. EDX data obtained is plotted in the phase diagrams (Fig.5) to estimate the phase composition of the samples. The dominant phase assemblages formed in paste samples are CH-CSH-monosulphate.

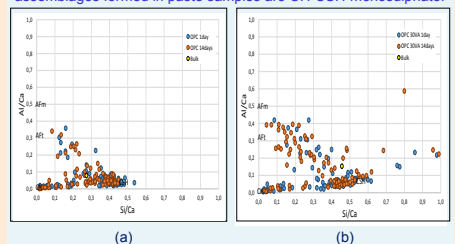


Figure 5. Estimated phase composition based on Si/Ca versus Al/Ca (atomic %) of (a) 100% OPC and (b) 70% OPC-30% VA. Bulk represents average of the paste including unhydrated cement grains and volcanic glass.



Figure 6. Instruments used for analysis

Conclusion

The microstructure becomes more and more denser with increasing the amount of VA over a longer period of curing time. The C-H formed in the initial hydration reaction of C_2S and C_2S reacts further with VA and forms more C-S-H (pozzolanic reaction) and this can be considered as the 2nd stage of C-S-H formation. So ideally between 10-30 % replacement will be suitable for optimum pozzolanic reaction and for additional formation of C-S-H.

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Use of Sophisticated Micro and Analytical Procedures to Measure the Impact of Natural Pozzolana on Densification of Cement Paste Hydration

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³ Massachusetts Institute of Technology (MIT)

Abstract

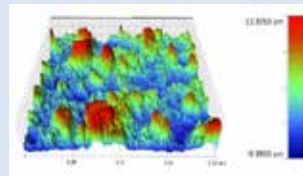
- The use of volcanic ash as a partial substitute to Portland cement can be a viable alternative for producing sustainable and durable cementitious materials.
- This study investigates the effect of early and late age curing of hardened cement pastes made with volcanic ash and Ordinary Portland Cement (OPC). Pore and microstructure studies were performed on hardened cement pastes prepared with 10 % incremental substitution of volcanic ash up to 50 % substitution of OPC.
- Densification in hardened cement pastes was attributed to formation of Calcium Silicate Hydrate (C-S-H) and Calcium-Alumino-Silicate-Hydrate (C-A-S-H) gels, while the development of Magnesium-Silicate-Hydrates (M-S-H) led to decalcification of C-S-H and C-A-S-H gels which resulted in an increase in porosity of the cementitious matrix.
- A combination of bulk and surface characterization techniques was used to facilitate effective usage of volcanic ash as a potential substitute for Portland cement that provides a sustainable construction material, and environmentally friendly solution to volcanic ash disposal.

Objectives

To further the understanding of how to effectively substitute volcanic ash into Portland cement paste for better performance, durability and sustainability by considering various microstructural product formation along with the influence on pore structure.

Results

Surface Analysis



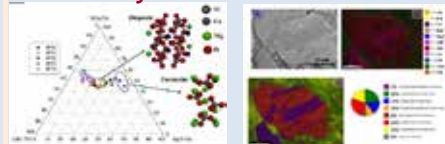
The surface 3D plot showing the surface roughness along the sample. An average surface roughness of ~7 μm was achieved for the sample.

XRD Analysis

Phases related to C-S-H and C-A-S-H were observed among the volcanic ash substituted combination.

Amorphous content increased in hardened cements with the increase volcanic ash content in the mix.

SEM Analysis



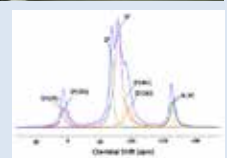
NMR

Analysis

NMR, Chemistry Department, Kuwait University

Magic Angle Spin ²⁹Si

showed the presence of C-S-H, C-A-S-H and M-S-H.



²⁹Si MAS NMR

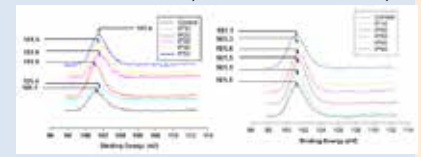
X-Ray Photoelectron Spectroscopy

Decrease in Si 2p binding energy was observed due to additional curing (90 days) indicating additional C-S-H formation.

XPS Instrument, Kuwait University

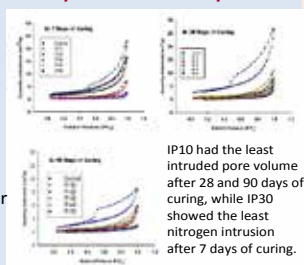
XPS analysis for Si

7 Days 90 Days



Nitrogen Adsorption-Desorption

At different age of curing different volcanic ash/OPC combination needs to be selected to tailor specific applications.



IP10 had the least intruded pore volume after 28 and 90 days of curing, while IP30 showed the least nitrogen intrusion after 7 days of curing.

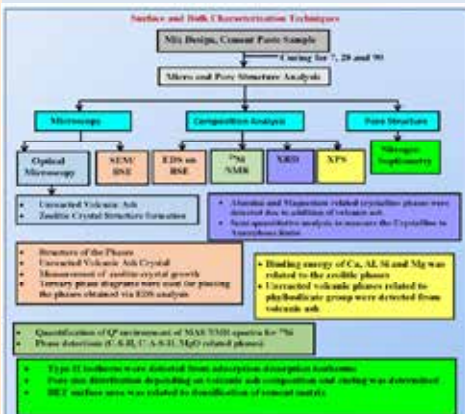
Conclusion

- The results indicate that volcanic ash is a viable substitute for Portland cement and provides a sustainable, cost effective, and environmentally friendly solution to volcanic ash disposal.

Acknowledgement

We acknowledge "Kuwait Foundation for the Advancement of Sciences" and "Kuwait-MIT Center for Natural Resources and the Environment" for the support during this work.

Methods



In this study, micro and pore structures were examined for five different combinations of hardened cement pastes prepared with volcanic ash and OPC after 7, 28 and 90 days of curing.

Structural health monitoring of Tall buildings in Kuwait

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Abstract

During the last few years, vast urban development is observed, and tall buildings and skyscrapers are being constructed in Kuwait. These tall building are vulnerable to any ground motion especially for the fact that Kuwait is located near Zagros area which has many geological and seismic activities. Therefore, the objectives of this study are: calculating the seismic ground displacements due to local and regional earthquakes; data acquisition and processing systems; understand the structural performance of the buildings including dynamic characteristics under the actual environmental and foundation conditions; construct a mathematical model for the prediction of building performance and structural characteristics for various load conditions and perform correlation studies with the results from the measurements; evaluate building safety through data analysis and mathematical models and study parametrically possible strengthening and retrofit scenarios; assess level of structural safety (reliability), serviceability and comfort level, and evaluate existing building code requirements and make recommendations for improvement based on the performed studies. The Structural Health Monitoring System (SHM) is conducted to the highest building in Kuwait, which is Al-Hamra building, to collect data and monitor its dynamic characteristics.

Introduction

Structural health monitoring (SHM) involves continuous monitoring of the dynamic characteristics of a structure by digital instruments (e.g., acceleration sensors). SHM helps to detect and locate the damage, and to make a decision automatically whether the damage is within the acceptable limits for the structure or not [1-4]. Recently, there is a large increase in construction of tall buildings in Kuwait. Photographs for the Kuwait City is depicted in Fig. 1. It may be noted that several tall buildings in Abu Dhabi were shaken during April 9, 2013 Bushehr, Iran (M6.3) and April 16, 2013 Iran-Pakistan Border (M7.8) earthquakes. SHM helps to monitor the structural behavior during such unforeseen events. Hence, SHM is very important in Kuwait and the middle east. In this paper, instrumentation details of the SHM system designed as a part of the real time monitoring of the Al-Hamra tower is presented.



Fig 1. View of the Kuwait City

Objectives

- To carry out finite element analysis to examine the dynamic characteristics of the tower numerically
- To obtain the optimal sensor placement for the structural health monitoring system

Finite Element Analysis

The sensor design is based on:

- Free vibration analysis of the Al-Hamra tower using finite element model (Mode shape behavior) (Fig. 2 & 3).
- Visual inspection: To examine accessibility of the locations.
- Structural and architectural drawings.
- The tallest building in Kuwait – the Al-Hamra Tower (412.5 m) was chosen to be monitored. The building was built using cast-in-place concrete. A full scale finite element model (Figs. 2 & 3) of the Al-Hamra
- Tower was constructed to study its dynamic characteristics and establish the model as a basis for SHM. Beam, frame and shell elements are used to describe the structural components of beams, columns, shear walls, etc.



Fig. 2. Finite element model of the Al-Hamra Tower



Fig. 3. First three modes of the Al-Hamra Tower model(6.5, 4.8, 2.9 sec)

Optimal Sensors Placement Analysis

Sensor placement plays a key role in deploying sensor networks for efficient and effective health monitoring of tall buildings. Optimal placement of a given number of sensors is able to capture and extract as much information as possible for evaluating the structural integrity.

A discrete optimization-based automated OSP algorithm was proposed to find the best theoretical sensor locations (see Figs. 4-6) for instrumentation of the Al-Hamra Tower. The sensors is designed to identify the building's main vibration modes and their variations along the height, including two horizontal translations, rotations with respect to vertical axis, rocking motions with respect to foundation, and soil-structure interaction.

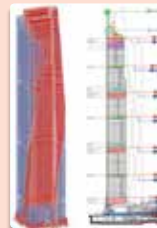


Fig. 5. Extracted Al-Hamra Tower modes for OSP

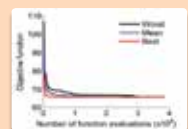


Fig. 6. OSP convergence

Fig. 4. Al-Hamra Tower instrumentation design

Results

The sensors recommended for the SHM system include accelerometers, tilt-meters (i.e., rotational sensors), GPS sensors, a wind sensor, and temperature sensors. It is spread over nine floors along the height. Detailed instrumentation design is presented in Table 1. The system will include software to process, analyze, and interpret the data, and graphically display the results, all in real time. The software will also include a module that will warn the Tower's operators when any response parameter gets close to the pre-defined threshold levels.

Table 1. Details of the Instrumentation

Floor Location	Uniaxial accel	Biaxial accel	Uniaxial accel	Electro Tiltmeter	GPS sensor	Wind sensor	Temperature sensor
Roof	-	-	-	-	2	1	2
76	-	-	-	-	-	-	-
65	-	3	-	1	-	-	-
54	-	3	-	1	-	-	-
42	-	3	-	1	-	-	2
29	-	3	-	1	-	-	-
16	-	3	-	1	-	-	-
6	-	3	-	1	-	-	-
B2	-	3	-	-	-	-	2
B3	2	-	2	-	-	-	-
Total No. of sensors	2	24	2	7	2	1	6
Total No. of channel	2	48	6	14	6	2	6

Conclusion

This techniques that were studied in this project are: finite element modeling, optimal sensor placement, and monitoring data processing for integrated SHM of tall buildings. The developed approaches are readily used for SHM of tall buildings such as the Al-Hamra Tower in Kuwait.

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Kuwait's Coral Reef and Rehabilitation of the Marine Environment

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Abstract

Coral reefs in Kuwait occur at high latitude (29° N) and in extreme environmental conditions (SST range: 13 to 32 C, annually), and have been subject to chronic anthropogenic pressure in recent decades (recurrent bleaching, oil spills and chronic recreational anchoring and diving impacts). Coral communities at six sites around Kubbar Island were surveyed in 2015 and compared these to quantitative survey results collected at the same sites 31 years earlier (1984) as well as results from several sites resurveyed a decade ago (2003) in order to characterize changes in coral community structure in this marginal reef environment. Mean coral cover was 25% in 2015 compared with 34% in 1984, but declines in coral cover were significant at only one site. A total of 13 coral genera were observed across sites, comparable to the 12 observed in 1984 and the 13 observed in 2003. Urchins have historically been considered an important bioeroder on Kuwait reefs, reaching densities of up to 100 m⁻². Echinometra mathaei density averaged 9.7 urchins m⁻² in 2015, far lower than the 62 urchins m⁻² observed in the 1980s, suggesting that earlier observations represented a bloom following bleaching that occurred in the early 1980s. Overall, the results of this study show a high degree of long term stability in coral community structure in the marginal and heavily disturbed environment of northern Kuwait

Introduction

Kuwait Oil Company (KOC) deployed 1,000 reef balls over an area of 48,500 m² in 2005, creating a large artificial reef system (Alhazeem et al., 2010). The reef balls were deployed in water depths of about 7 to 9 m off the coast of Kuwait, about 4 NM south and 1.5 NM east of Al-Ahmadi Port at 28°59.279'N; 48°12.418'E (Fig. 1). The artificial reef deployment was initiated by the KOC to contribute to the conservation and rehabilitation of the marine environment, and to provide additional reef habitats to enhance fish stocks.

The Kuwait Institute for Scientific Research (KISR) has a research contract with KOC to assess the potential for use of artificial reefs in habitat enhancement / rehabilitation in Kuwait. This project has the stated aim of assessing the potential for implementation of an artificial reef project at Kubbar, an offshore island with extensive coral reef development that is located approximately 70 km off-shore from Kuwait city and it is one of the best developed reef islands (Figs. 1 and 2). The coral reef at Kubbar is considered to be under higher pressure from anthropogenic stressors than most offshore reefs of Garoh and Umm Al Maradem islands (Fig. 2) both as a result of its closer proximity to the city (ie. damage from boat anchorage and diving) as well as its location adjacent to intensive shrimp trawling areas (ie. sedimentation). The qualitative and quantitative surveys of the benthic community at the Kubbar reef was carried out. The detailed information documenting the findings of these surveys and recommendations regarding the potential use of artificial reefs at Kubbar.

Materials and Methods

Photoquadrats were used to survey the reef community at each of the five sampling sites (Fig. 3). Six replicate 30 m transect tapes were laid out perpendicular to the reef slope at each site, with the deepest point starting ca. 10 m in from the reef base and extending up the reef slope. Depth at the base of the transects ranges from 4 to 8 m, and was ca. 2 m depth at the shoreward end. Transect tapes were laid parallel to one another and spaced ca. 5 m apart, providing broad coverage of the same general reef areas that were surveyed by earlier authors. A Nikon D700 dSLR camera mounted to a frame enclosing a 0.25 m² quadrat area was used to capture high-resolution digital images of quadrats at 3 m interval along each transect, for a total of 11 quadrats per transect and 66 quadrats per site (Bento et al., 2015; Burt et al., 2011a; Burt et al., 2013; Burt et al., 2015).

Results

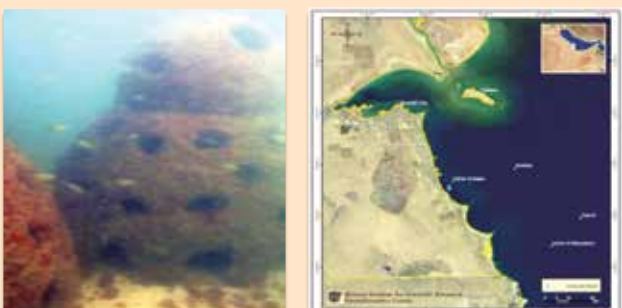


Fig. 1. Locations of the Kuwait Oil Company's artificial reef and Kubbar island.



Fig. 2. The best developed coral reefs of Kuwait is at Kubbar, Garoh and Umm Al Maradem islands.

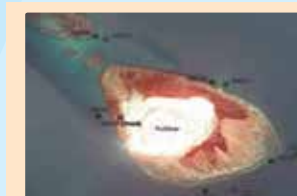


Fig. 3. Anchoring locations for survey sites in the current study (2015, green) relative to the anchoring points for surveys performed in 1986 (yellow) by Downing (1989).

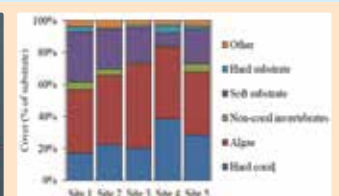


Fig. 4. Overall composition of the benthic community at the five survey sites at Kubbar Island.

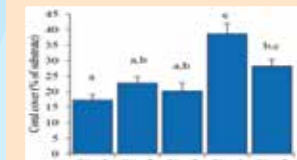


Fig. 5. Mean (±SE) coral cover at each sampling site. Different letters indicate significant differences between sites (Tukey's test, p < 0.05).

Genus	Site 1	Site 2	Site 3	Site 4	Site 5
Acroporaceae	+	+	+	+	+
Agave	+	+	+	+	+
Alcyonacea	+	+	+	+	+
Cyathocera	+	+	+	+	+
Cyathocera (Bassett-Parker)	+	+	+	+	+
Favosites	+	+	+	+	+
Leptoseris	+	+	+	+	+
Poritidae	+	+	+	+	+
Porites	+	+	+	+	+
Poritopsid	+	+	+	+	+
Scleractinia	+	+	+	+	+

Table 1. Coral genera observed at each survey sites at Kubbar Island.

Discussion

The decline in coral cover at one single site was mainly due to a >80% loss of formerly dominant Acropora, and a concomitant shift towards a lower cover community dominated by masses. Artificial reefs are to be considered, that they instead be used as means to divert pressure away from the important natural reef at Kubbar, rather than as a compensatory mechanism. Recreation boat anchor damage has been consistently reported to be a problem at the coral islands of Kuwait since the 1980s (Carpenter, 1997; Downing, 1989; Price, 1993). Although deployment of mooring buoys have removed some of the pressure from these reefs (Rezai et al., 2004), anecdotal reports suggest that the density of boats far exceeds mooring capacity, particularly on weekends. If artificial reefs were constructed at some distance from the natural reef and designed to be dual purpose – serving both as a mooring station and a dive site – the use of artificial reefs could provide conservation benefit to the natural reef ecosystem at Kubbar. By providing an alternate mooring area, they could serve to reduce anchor damage to the natural reef ecosystem, and if designed in a network format using clustered notes connected by corridors, they could provide an interesting alternative for recreational divers, reducing fin strikes and other diver impacts.

Conclusion

The purpose of this study has been to assess the current status of the coral reef at Kubbar island to determine whether the use of artificial reefs is warranted. The results of this study are quite positive in indicating that there has not been substantial degradation of Kubbar's coral reef over the past three decades. In terms of cover, generic diversity, and community composition, there have been few changes in the coral community since this area was first surveyed in the 1980s. These results are particularly important in light of the fact that coral reefs elsewhere in the Arabian Gulf have experienced considerable declines in live coral cover and substantial shifts in community structure in the past 15 years (Burt et al., 2011; Burt et al., 2013; Burt et al., 2015; Kavousi et al., 2013). Together, these results suggest that Kubbar island should be considered an important ecological asset for Kuwait, and that the deployment of artificial reefs for reef restoration or compensation purposes is not warranted.

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Sea cucumber and Mitigation of Marine Pollution

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Abstract

Kuwait's marine environment suffers from increased organic pollution. Sea cucumbers play an important role in the marine environment. They create a healthier environment for many types of benthic micro-organisms through their slow movement and feeding mechanism on micro-organisms and organic material. A preliminary study has been conducted in KISR to assess the possibility of using sea cucumbers for mitigation of the coastal pollution. The results showed promising possibility for using sea cucumber to lower the organic load in sediments.

Introduction

Kuwait's marine environment suffers from increased organic pollution and low oxygen in semi-closed areas. Several fish kills have been reported during hot summers due to low oxygen. Sea cucumbers maintain the coral reef's health levels in semi-closed coastal locations.



Fish kill 2005 in Marina because of low oxygen (KISR)



Sea cucumbers, as bioturbators, prevent the accumulation of organic material and hardening of bottom surface and formulation of the harmful hydrogen sulphide layer via their movement and feeding mechanism. A preliminary study conducted at KISR showed promising results in using sea cucumber for lowering organic load in sediments.

However, the currently very few quantitative studies reported on this kind of research.

Materials and Methods

The sea cucumbers were kept for acclimatization and fattened using dried seaweeds. Organically rich sediments namely black sediments were collected from a heavily polluted coastal area near the Rescue Centre Marina at Ras Al Salmiyah. Six aquaria (65x 40x 30 cm) were used and filled with 5 cm height (7 kg) of the sediments added in each tank. Sediment was sieved by using a 1 mm mesh to remove large particles. Total of four animals are added in each tank, three animals of the species *Stichopus hermanni* and one of the species *Holothuria atra* (around 1 kg biomass). No feed was provided to the animals during the duration of the experiment. Weekly measurement for the total biomass of the animals will be measured to the nearest 0.01g. Daily measurement of Temperature, DO, Salinity and pH was recorded.



Fig.1 *Holothuria atra*



Fig.2 *Stichopus hermanni*

On weekly bases, water samples from each tank was analyzed for NO_2 , NO_3 , NH_4 and SiO_2 (based on the cadmium reduction method). Ammonia was measured manually using the Beckman spectrophotometer (Grasshoff et al., 1993). Also, the water was measured for silicate and phosphate. Total organic carbon (TOC) was measured as well according to EPA method 9060. Chlorophyll was determined using the Turner Chlorophyll-a Protocol.

Sediment samples was analysed weekly for TOC, nutrients concentration (phosphorus, nitrate, nitrite and ammonia), suspended solids, H_2S , total sulphate and total iron.



Fig. 3 The Organic Pollution Mitigation Experiment

Results

Sediments Analysis

The results of this experiment showed that the total organic carbon (TOC), ammonium-nitrogen (NH_4) and phosphorus (PO_4) contents in the dry sediment ranged from 0.14 to 2.5%, 0.002 to 0.01 mg/g and 0.01 to 0.03 mg/g, respectively. A TOC content in the sediment increased with time at culture experiment, indicating that organisms farming enhanced the accumulation of organic matter in the sediments to some extent. Sediment showed net nitrate, ammonium and phosphorus uptake during the experiments periods, and significant differences were found among periods of experiments. The sudden variation occurred for nutrients fluxes (such as NH_4 and PO_4) due to the infection occur the organisms during certain periods.

Dissolved inorganic phosphate (DIP) was released from the sediments in all treatment tanks with low flux rates. The results suggested that non-artificial-feeding sea cucumber culture ponds could not only yield valuable seafood products, but also effectively remove nutrients from the aquaculture systems and consequently alleviate nutrient loadings of the nearby coast and improve the water quality.

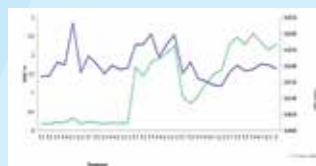


Fig. (1) Effect of Sea Cucumber Treatment on TOC and Phosphorus.

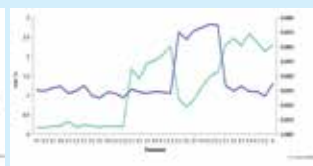


Fig. (2) Effect of Sea Cucumber Treatment shows the negative relationship between the TOC and Ammonium.

Water Analysis

The nutrient concentration in the seawater samples collected from different tanks is summarized in the table 1. The average concentration of nitrate, phosphate and ammonia in the replicate tanks (Tank 1, 2, 3 and 4) were $19.04 \mu\text{M}$ (0.22 to $48.22 \mu\text{M}$), $0.86 \mu\text{M}$ (0.21 to $2.37 \mu\text{M}$) and $45.62 \mu\text{M}$ (7.75 to $87.11 \mu\text{M}$) respectively. The mean concentration of nitrate, phosphate and ammonia in the controlled tanks (Control 1 and 2) were $5.97 \mu\text{M}$ (0.28 to $24.93 \mu\text{M}$), $1.27 \mu\text{M}$ (0.44 to $2.41 \mu\text{M}$) and $20.31 \mu\text{M}$ (10.21 to $40.74 \mu\text{M}$) respectively.

The average phosphate concentrations were within the range of values published by Al-Yamani et.al.2004 in Kuwait's waters.

The concentrations of nutrients in tanks with living organisms were much higher than the controlled tanks. Also, the nutrients concentration was sharply increased after 18th October, 2012. Ammonia concentrations were higher than the average reported values in Kuwait's waters and showed a sharp decrease after 18th October, 2012. Hence the life cycle of the organisms living in the tanks is affecting the nutrients concentration either positively or negatively. More likely ammonia was decomposed/oxidized to nitrate by the bacteria living in water. General findings showed interesting remarks: which should lead to further investigation and more controlled experiments. Ammonia should be measured manually by fixing at the field to get accurate estimates of ammonia values.

Treatment	NO_3 (μM)			PO_4 (μM)			NH_3 (μM)		
	Mean	Max	Min	Mean	Max	Min	Mean	Mean	Mean
Tank 1	18.83	44.4	0.22	0.5	0.67	0.21	52.4	87.11	8.34
Tank 2	9.3	48.22	0.24	0.99	1.97	0.48	40.19	78.28	7.75
Tank 3	21.31	43.57	0.075	1.06	2.37	0.35	44.19	77.52	16.9
Tank 4	13.82	41.96	0.3	0.82	2	0.32	45.25	80.74	12.96
Control 1	5.22	24.93	0.28	1.39	2.41	0.63	19.52	36.6	10.54
Control 2	4.93	18.12	0.32	1.07	16.3	0.44	20.27	40.74	10.21

Table 1: Nutrient concentration in replicate tanks with sea cucumber and controlled tanks during the sampling period 29th September 2012 to 8th November 2012.

Conclusion

Sea cucumber shows promising results in lowering the organic pollution. A pilot scale study is required to be conducted to assess using cultured sea cucumber to mitigate the organic pollution in the closed coastal areas.

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A Statistical Approach to Predict the Changes in One of Biofuels Feedstocks in the State of Kuwait

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Abstract

A study was conducted in order to determine the future changes in biofuel feedstock, namely, used cooking oils in the state of Kuwait. The method used in this study involved data collection of all raw cooking oils produced in Kuwait and exported to it between the period of 2011 and 2014, which represents the overall amount of cooking oil within the country. This is followed by a calculation of the estimate used cooking oil produced from its initial form. The estimated amount is then forecasted using linear regression trendline for forward data to determine the future changes in quantities up to the year 2020. The research findings showed that the amount of used cooking oils will increase by 32% in the year of 2020 and that the percentage of error for the yearly prediction is 6%.

Introduction

The growing number of population has led to restaurants and houses to widely spread in Kuwait. This has increased the amount of oils used in daily cooking and their waste outcomes (Naima and Liazid, 2013; Rubianto et al., 2013). As these oils have organic bases, they can be considered as feedstocks to produce biofuel. Its combustion produces a safe and environmentally clean energy output (Oprea et al., 2007; Oprea et al., 2008; Ampaitepin and Tetsuo, 2010). This energy can be utilized to produce power for applications such as camping or even help provide electricity at remote areas where infrastructure is limited. In 2005, biofuel production had reached 1.1 billion gallons worldwide, with most fuel being produced in the European Union (Knothe, 2001). Kuwait has made advanced achievements in utilization of renewable energy sources like wind and solar through its Shagaya power plant project. Thus, proposing another source based on waste transformation will be an added value to Kuwait's energy diversification and environmental concerns.

Objectives

The main objective of this study was to determine the total changes in used cooking oil in the state of Kuwait up to the year 2020 by statistically forecasting the data collected from the years 2011 to 2014.



Methods

Data on the quantities of cooking oils that are imported and produced in Kuwait from both the Kuwait Central Bureau, and the Kuwait Flour Mills and Bakeries Company between 2011 and 2014 were collected. This is because they represent the only available source of cooking oil within the country.

The collected data are forecasted statistically using a linear trendline for forward data to predict the future changes in quantities. A 50% reduction in the collected and forecasted data is assumed for the possible amount of used cooking oils that can be collected from its initial stage and used as biofuel feedstock (Naima and Liazid, 2013).

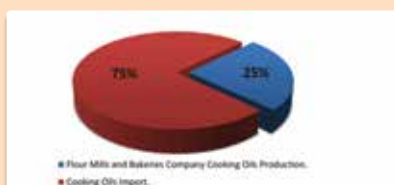


Figure 1. Cooking oils market share in Kuwait.

Results

The results show that the market share from 2011 to 2014 for both imported and produced cooking oils in Kuwait are 75% and 25% respectively. In 2011, the total amount of used cooking oils was 74,013,481 kg. This is expected to increase by 32% in the year of 2020. The percentage of error for the yearly forecast is +/- 6% which is reliable since it is less than 10%. Figure 1 demonstrates the market share of cooking oils and Fig. 2 illustrates both the collected data and the forecast trend line.

Conclusion

An evaluation of the future increase in used cooking oils within the state of Kuwait was carried out. The study included data collection from the period of 2011 to 2014 on raw cooking oils from the local producer, Kuwait Flour Mills and Bakeries Company, and from all exported sources available at Kuwait Central Bureau. The data were then forecasted to determine the future changes in quantities up to the year 2020. The results showed an increase of 32% with a yearly error factor of 6%. This indicates that used cooking oils as a feedstock has a great potential in supplying the production of biofuel in Kuwait.

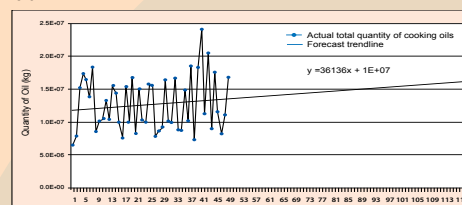


Figure 2. Cooking oils collected data and forecasted trendline.

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Evaluation of commercial *Rhizobium leguminosarum* ATCC and *Bradyrhizobium* sp. ATCC on the nodulation potential of *Acacia pachyceras* under greenhouse conditions

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Abstract

The purpose of this research was to evaluate the nodulation potential, seedling growth, and nutrition of *Acacia pachyceras* when inoculated with two commercial inoculum *Rhizobium leguminosarum* ATCC and *Bradyrhizobium* sp. ATCC under greenhouse conditions. The characteristics of Kuwait soil with high gypsum and salt content and low clay and organic content makes the land deficient in plant available nutrients. Consequently, there is a need to improve soil fertility to protect and restore the only native plants *Acacia pachyceras* of Kuwait. In this present greenhouse study, *Acacia pachyceras* seedlings were inoculated with two commercial inoculum, and the nodulation capacity, nitrogen content, and growth performance of the seedlings were evaluated. The successful nodulation on *Acacia pachyceras* roots by *Rhizobium leguminosarum* ATCC and *Bradyrhizobium* sp. ATCC has occurred and confirmed that these two commercial inoculum have the ability to infect and establish nodulation with *Acacia pachyceras*. Our results also show improved seedling nutrition when inoculated with commercial inoculum. Further research is required to investigate the nitrogen fixation capacity of these commercial inoculum before using it in a large-scale inoculation program. However, our preliminary results suggest that these two commercial inoculum could be useful when used at optimum application rates of bacterial inoculum in inoculation programs to increase the growth and nutrition of *Acacia pachyceras*.

Introduction

Revegetation of degraded lands requires production of good quality nursery seedlings for successful establishment of seedlings (Quoreshi, 2008). Nitrogen fixing tree species can play a major role in improving productivity of degraded desert soils. Inoculation of *Acacia* spp. with effective rhizobia may benefit plant establishment and growth in the nursery and field. *Acacia* spp. often exhibit specificity for effective nitrogen fixation and require evaluating any commercial inoculum before using it in a large-scale inoculation program. Nitrogen fixation in leguminous plants is accomplished by the root internalization (infection) of microsymbiont and development of specialized nitrogen fixing root organs called nodules. The nitrogen fixed in the leguminous plants increases the soil fertility when the plant leaf or tissues reaches the rhizospheric soil and is decomposed by the soil microbes for the release of plant essential micronutrients. The adverse effect of the generous use of chemical fertilizers leads to the use of this alternative form of fertilizer called bio fertilizers. *Acacia pachyceras* is the only native tree species of Kuwait and the nodulation potential and nitrogen fixation capacity of this tree species with *Rhizobium* or *Bradyrhizobium* are not reported in Kuwait. In this greenhouse study, *Acacia pachyceras* seedlings were inoculated with two commercial inoculum of *Rhizobium leguminosarum* ATCC and *Bradyrhizobium* sp. ATCC to evaluate the nodulation potential, nitrogen uptake, and growth performance of test seedlings.

Objectives

To evaluate the competency of commercial *Rhizobium leguminosarum* ATCC and *Bradyrhizobium* sp. ATCC on the nodulation potential growth and nutrition of *Acacia pachyceras* under greenhouse conditions.

Methods

Germination of *Acacia pachyceras* seeds

The pre-germinated *Acacia pachyceras* seeds were grown in jiffy-pots containing potting soil and perlite mix as planting medium until the appearance of three primary leaves (two weeks). Transplantation was done from the jiffy pot to one gallon pot containing the same planting medium at the end of the second week and allowed to grow under greenhouse conditions.

Inoculum preparation and inoculation

The commercially available *Rhizobium leguminosarum* ATCC and *Bradyrhizobium* sp. ATCC (American Type Culture Collection) was grown on Yeast Extract Mannitol broth (YEM) for 24 h at 30°C with continuous shaking of 180 rpm. The bacterial cells were harvested by centrifugation and the pellet was washed and suspended in 0.89% saline. The optical density (OD) of the bacterial suspension was adjusted to one by diluting the suspension with normal saline. One month after transplantation to one gallon pots, a replicate of five seedlings were inoculated with 3 ml of 1 OD bacterial suspension (*Rhizobium leguminosarum* ATCC [1.1x10⁸ cells] / *Bradyrhizobium* sp. ATCC [1.2x10⁷ cells]), where 3 ml of sterile normal saline solution was added to the control. Two seedlings of similar sizes were harvested at the time of inoculation to evaluate the root system as reference. The seedlings were harvested after 26 weeks for evaluation. The images of *Acacia* seedlings at the time of inoculation and at the time of harvest (26th week) are given in Figs. 1 and 2.

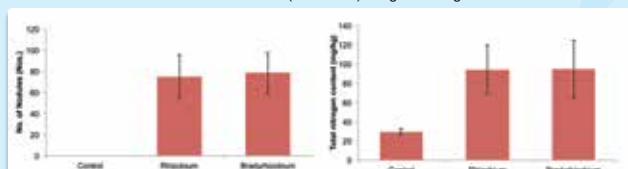


Fig. 5 Average no. of nodules of inoculated and uninoculated *Acacia* seedlings

Fig. 6 Average nitrogen content of shoot of inoculated and uninoculated *Acacia* seedlings

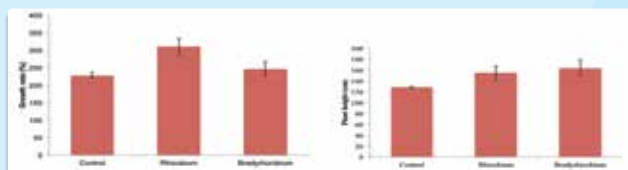


Fig. 7 Average growth rate of inoculated and uninoculated *Acacia* seedlings

Fig. 8 Average plant height of inoculated and uninoculated *Acacia* seedlings

Data collection

At the end of the 26th week, all the seedlings were harvested and each of the *Acacia* seedlings were evaluated for nodulation, nutrient uptake (NPK), and growth performance (height, growth rate, fresh plant biomass, and dry mass of shoot).

Results

- The results revealed that the commercial inoculum used in this study have the ability to infect and form root nodule with the *Acacia pachyceras* roots (Figs. 3, 4 and 5).
- There were no root nodule formation observed with uninoculated control seedlings.
- Seedling nutrition (Table 1 and Fig. 6) and plant growth (Figs. 7, 8, and 9) improved when compared to the control seedlings.
- Shoot nitrogen content significantly improved suggesting that nitrogen fixation had occurred with inoculated seedlings, but further research is needed for the confirmation of the nitrogen fixation process.

Conclusion

Based on our preliminary results, we conclude that there is a potential for the use of these two commercial inoculum, *Rhizobium leguminosarum* ATCC and *Bradyrhizobium* sp. ATCC, in inoculation studies in improving growth and nutrition of *Acacia pachyceras* seedlings.

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Fig. 1 Inoculation of *Acacia pachyceras* seedlings with commercial bacterial inoculum



Fig. 2 *Acacia pachyceras* seedlings at the time of harvest



Fig. 4 Root nodules of *Acacia pachyceras* seedlings inoculated with *Bradyrhizobium* sp. ATCC



Fig. 3 Root nodules of *Acacia pachyceras* seedlings inoculated with *Rhizobium leguminosarum* ATCC

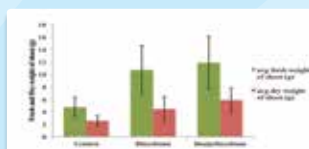


Fig. 9 Average fresh and dry shoot biomass of inoculated and uninoculated *Acacia* seedlings

Bacteria	Avg % of N in shoot plant	Avg % of P in shoot plant	Avg % of K in shoot	Avg total shoot N content	Avg total shoot P content	Avg total shoot K content
Control	1.88	0.80	2.22	29.49333	24.08	87.03
<i>Rhizobium leguminosarum</i> ATCC	1.77	7.51	3.04	94.85333	29.26	125.26
<i>Bradyrhizobium</i> sp. ATCC	1.81	0.85	3	94.05667	33.21	145.52

Table 1. Nutrient content of inoculated and uninoculated *Acacia pachyceras* seedlings

Influence of Light Quality Combined with the Use of Surface-Anodized Gutters on the Growth and Development of Hydroponically Grown Leaf Lettuce in a Closed-Type Plant Factory System

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Abstract

This study was conducted to examine the effect of different light qualities combined with the use of eco-friendly surface-anodized growing gutters on the growth of leaf lettuce (*Lactuca sativa* L. 'Jeockchima') in a closed-type plant factory system. Three different light quality treatments, i.e., fluorescent light, combined RBW light emitting diode (LED) (R:B:W=8:1:1) or White LED at 150 $\mu\text{mol m}^{-2} \text{s}^{-1}$ PPFD with a 18/6 (light/dark) photoperiod, combined with three gutter-type bed treatments (anodized surface at a thickness of 0 μm , 10 μm or 20 μm) were used in a closed-type plant factory system. The combination of 20 μm treatment with RBW LED gave results where the maximum plant fresh weight, plant height, and number of leaves were achieved with lesser root length. Further analysis with anthocyanin and nitrate content showed that FL, RBW LED or White LED combined with 10 μm treatment gave the best results for higher anthocyanin and lesser nitrate content. Analysis of aluminum content in the recycling solutions and hydroponically grown plants was determined and the results obtained showed no level of toxicity in the anodized gutter treatments, but aluminum levels were increased in the control gutter treatment. Our data showed that optimizing light spectrum and anodized gutter treatments for hydroponically growing lettuce in a closed-type plant factory system, it is worth having a combination of RBW LED and anodized gutters of 20 μm treatment. Furthermore, the study results show the double advantage that we have increased productivity with high plant quality, as well as completely abolish aluminum toxicity both to the plant, and human beings who consume these plants.

Introduction

The increasing demand for fresh vegetables has led to the cultivation of vegetables under protected horticulture systems in a large scale manner in order to meet the worldwide demand. Closed systems for plant production with artificial light have several potential benefits, such as higher quality of transplants, shorter production period, and smaller use of resources, compared with conventional systems. Plant factory is the top pattern of modern protected horticulture and is advantageous over other methods by means of efficient land use, year-round production, and increased productivity (Kwon, 1996). In recent years it has been increasingly important to provide safe and healthy food with good quality to consumers, particularly for leafy vegetables which are eaten raw. The recent progress in solid-state lighting, based on light-emitting diodes (LEDs), facilitated and expanded the research in this field and created an outlet for new progressive plant cultivation technologies. It is really important to study and determine the appropriate light quality provided by LED lighting and its effect on plant growth in a closed-type plant factory system. The result outcomes would be useful in selecting the best energy-use efficient wavelengths for increased production of plants with high quality.

Objectives

To investigate the effect of different light qualities combined with the use of surface-anodized aluminum gutters on growth parameters, anthocyanin content, nitrate metabolism and aluminum levels in leaf lettuce (*Lactuca sativa* L. 'Jeockchima') which is one of the major vegetable cultivated in a closed-type plant factory system.

Methods

- Plant material: Leaf lettuce (*Lactuca sativa* L. cv. Jeockchima)
- Grown in chamber type, closed plant production system (Model C1200H3, FC Poibe Co. Ltd.)
- Treatments: 3 light treatments [FL (control), LED ~ (R:B:W = 8:1:1), White LED] and 3 gutter-type beds [anodized surface at a thickness of 0 (control), 10, 20 μm] x 3 Reps. x 18 Plants x 3 Chambers
- Light intensity: 150 \pm 10 $\mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$
- Photoperiod: 18/6 (Light/Dark)
- Irrigation: Deep flow technique with a recycling nutrient solution (pH 6.0 & EC 1.5 dS $\cdot\text{m}^{-1}$)

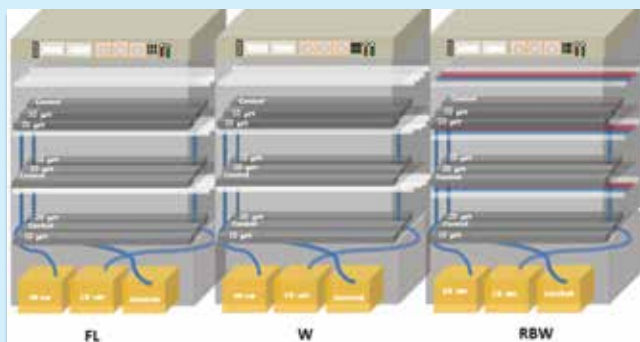


Fig. 1. Schematic diagram of the chamber set-up with a recirculating ebb & flow hydroponic system in the plant factory. The main features are FL: fluorescent lamp, W: white LED and RBW: R:B:W = 8:1:1 LED.

Results

- The plant height, leaf length, and leaf width were significantly greater in the FL combined with 10 μm treatment than the other combinations.
- R:B:W LED light in combination with 20 μm treatment gutters gave results where the maximum plant fresh weight and number of leaves were achieved with lesser root length.
- FL or RBW or White LED combined with 10 μm treatment gave the best results for higher anthocyanin and lesser nitrate content of lettuce.
- Al content was significantly higher in FL treatment and control gutters when compared to that of surface-anodized treatments.

Table 1. The effect of light qualities combined with the use of surface-anodized Al gutters for cultivation of lettuce seedling measured at 30 days after transplanting.

Light Quality*	Treatment†	Plant fresh weight (g)	Plant fresh weight (g)	Plant fresh height (g)	Leaf width (cm)	No. of leaves	Length of the longest root (cm)	Chlorophyll (SPAD)	Chlorophyll fluorescence (Fv/Fm)
FL	Control	27.9 d*	12.8 c	13.0 ab	8.6 bc	12 c	11.1 bc	12.9 bc	0.80 a
	10 μm	32.9 b-d	15.0 a	14.1 a	10.8 a	14 ab	12.5 bc	19.7 c	0.82 a
	20 μm	28.6 cd	14.1 a-c	12.9 ab	9.0 b	14 ab	9.6 c	22.7 ab	0.82 a
RBW (8:1:1)	Control	38.3 ab	14.5 ab	13.7 ab	10.6 a	15 ab	14.3 ab	25.0 a	0.63 b
	10 μm	32.3 b-d	13.4 bc	12.6 ab	9.7 ab	14 ab	12.5 bc	23.9 a	0.64 b
	20 μm	41.4 a	14.7 ab	13.1 ab	9.2 b	16 a	11.9 bc	23.6 a	0.77 a
White LED	Control	32.6 b-d	14.4 ab	12.8 ab	8.8 bc	13 bc	15.1 ab	19.9 c	0.77 a
	10 μm	35.1 a-c	14.4 ab	12.7 ab	9.2 b	14 a-c	14.1 ab	19.7 c	0.75 a
	20 μm	31.7 b-d	14.1 b	12.1 b	7.7 c	13 a-c	17.2 a	20.3 c	0.74 a

Z The light sources are FL, fluorescent lamp (Philips Co. Ltd., the Netherlands); R:B:W LED (red:blue:white = 8:1:1, FC Poibe Co. Ltd.); and WL, white LED (FC Poibe Co. Ltd.).
Y The treatments are aluminum gutters anodized at a thickness of 0 μm (control), 10 μm and 20 μm .
X Mean values (n = 3) \pm SE followed by different lower-case letters denote a statistically significant difference at P = 0.05 as determined by Duncan's multiple range test.

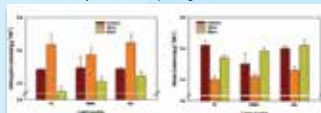


Fig. 2. Effect of light quality combined with surface-anodized Al gutters on the anthocyanin and nitrate content in lettuce leaves.

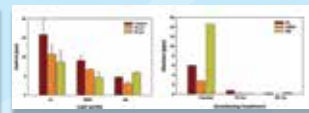


Fig. 3. Changes in lettuce and nutrient solution Al content as affected by light quality and surface-anodized Al gutters used for growth of lettuce in a closed-type plant production system.

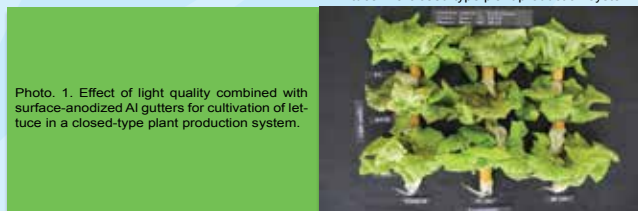


Photo. 1. Effect of light quality combined with surface-anodized Al gutters for cultivation of lettuce in a closed-type plant production system.

Conclusions

- The results suggest the use of FL or RBW light treatment as well as the potential benefit of anodizing the surface of aluminum gutters as culture beds in a closed-type plant production system.
- Our study has revealed that optimizing light spectrum and anodized gutter treatments for hydroponically growing in a closed-type plant factory system, it is worth having a combination of RBW LEDs or fluorescent lamps and anodized gutters treatment.
- The importance of the outcome of the present research presented provides valuable information for obtaining lettuce plants with high quality and good growth in a closed-type plant factory system.
- Moreover, the harvested lettuce pose no threat of aluminum toxicity to either the plant or to the human beings who consume these plants.

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Parental Awareness and Use of Internet Filtering Software in Kuwait

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Abstract

The paper addresses the problem of Internet filtering by measuring the level of awareness and use of this technology by families in Kuwait. Results showed a low level of awareness among families regarding filtering software available on the market. Even after their awareness, the majority of families were still reluctant to install filters because they believe that it is the obligation of their government and the ISP companies to provide protection for their children on the Internet. However, the low level of awareness of these filters instigates a public awareness campaign in all media printed and electronic about the importance of protecting children from harmful materials on the Internet and the role of families in this matter.

Keywords Internet filters, Censorship, Censor-ware, Families, Kuwait

1. Introduction

In order to prevent the Internet from causing harm and endangering the life of innocent people and at the same time benefiting from the wealth of information it contains, governments, organizations and families started using some kind of software to prevent access to such materials. Internet filtering is the term used to prevent users from accessing specific materials such as websites, webpages, blogs, or any materials available online. Internet filtering software (IFS), internet blocking software (IBS), and censorware are used interchangeably as tools to prevent Internet users from accessing or viewing materials that are considered unsafe or inappropriate. While many people support and encourage the use of these software to protect their children and communities, others see them as tools to deprive people from their own right to access information freely, and consider them tools for censorship.

2. Objectives of the study

The paper aims to answer the following questions:

1. What is Internet filtering and what are its different levels?
2. What is the level of parental awareness and use of these software in Kuwait?
3. Is Internet filtering considered protection or censorship?

3. Internet Filtering

Internet filtering normally refers to the technical approaches to control access to information on the Internet, as embodied in two approaches: Technical blocking where 3 commonly used techniques to block access to Internet sites: IP blocking, DNS tampering, and URL blocking using a proxy. Search result removals where rather than blocking access to the targeted sites, this strategy makes finding the sites more difficult (About Filtering, 2013). Even though the perfect Internet Filter does not exist in today's marketplace, there are a number of software that meets most government sectors, companies and families' needs. Some of the important criteria used to evaluate and select Internet filter software are: ease of use, high speed service, filtering algorithm, foreign language filtering, port filtering and blocking, and Activity reporting. (Peek, 2015). The most widely used Internet filtering software on the US market today according to Top Ten REVIEWS 2016 based on their features, ease of use and installation, and filtering effectiveness, are: Net Nanny, Spy Agent, Custodio, Pure Sight, McAfee Family Protection, Spysure, Verity, Norton Family, Cyber Sitter, and Covenant Eyes (Top Ten, 2016).

Filtering software programs, however, are prone to two simple flaws: under-blocking and over-blocking. Under-blocking is the failure to block access to all the content of harmful materials. On the other hand, filtering programs often block content they do not intend to block, also known as over-blocking. This problem is augmented when countries add their own block lists to existing commercial filtering programs. Not only do these countries often make mistakes, but their selection process is not open to peer review and scrutiny (Villeneuve, 2006).

4. Levels of Internet Filtering

Most countries recognize that each country has its own standards of proper and improper speech. Thus, they have turned to filtering with notable exceptions (Oram, 1998). Currently Internet filtering is conducted at one or more of the following four levels

4.1 The Government level is usually conducted by the ministry of information and communication such as those in Saudi Arabia, Syria, Venezuela, Iran and China. Protecting national security and community-accepted standards of decency are frequently cited goals (Walker, 2006). Some research has documented a large and growing swath of content beyond pornography that is targeted for filtering (Blau, 2007) and (Diebert, 2006).

4.2 The Internet Service providers' level. Most ISPs install filtering software on their networks such as those in Kuwait, Singapore and Malaysia based on the orders or recommendations of their governments' agencies. Other ISPs acknowledge filtering by showing block-pages when users try to access banned content

4.3 The organizations level. Most organizations conduct Internet filtering on their local area networks, Intranets, and Internet access. Their main reason is to maintain a high level of productivity by eliminating activities that slow down their performance such as leisurely web searching and chatting.

4.4 The parents' level. Many parents install commercially available software on their computers. As extra protection for their children

5. Internet Filtering in Kuwait

In general, the government of Kuwait does not directly conduct filtering of Internet websites. However, it requires the use of filtering software by the Internet service providers (ISP) in the country. All ISPs in Kuwait use specific software to filter and block specific Internet websites. Subscribers do not have the choice to filter or not to filter their DSL or mobile services. ISP companies providing DSL services such as Fastelco, qualitynet, United, and Kems, and those providing mobile Internet such as Zain, Viva, and Ooredoo, have installed filtering software on their main system and impose it on their subscribers. There are no clear criteria of filtering among the different ISP companies in Kuwait. The government and the ISP companies do not have clear rules and regulations of what to filter, instead they have general statements that require filtering of objectionable materials that are against Islamic principles and moral values in the country to "protect the public by maintaining both public order and morality." (State of the media..., 2015).

6. Awareness and Use of Internet Filtering Software

A questionnaire was distributed to 400 families in Kuwait to measure their level of awareness of this technology. Table (1) shows that the level of awareness is very low. Only 20.5 percent of the families are aware of such filters, meaning that only one person in five is aware of these tools. In spite of that, only 14.5 percent of the sample installed an Internet filter Software. This means that 6 percent of the people did not install IFS in spite of their awareness. The majority of the people in the sample (79.5 %) are not aware of the existence of such software.

Table 1 Awareness and Use of Internet Filtering Software (IFS) by Sample of the Public Sector in Kuwait

	Number	Percent
Awareness		
Aware	082	20.5
Not aware	318	79.5
Total	400	100%
Source of Information		
Internet	043	52.5
Friends	028	34.1
Media	011	13.4
Other	000	
Total	082	100%
Software Use		
Filter used	058	14.5
No Filter	342	85.5
Total	400	100%

Since the great majority of the people in the sample are not aware of the existence of Internet filters (318 or 79.5%) it was necessary to know if they will install such programs after being informed about them and understand their role and importance. Table 2 shows that the great majority (87 %) will not install IFS in spite of the awareness of their role and importance. Only 58 members or 14.5 percent of the families indicated that they are using filters for the protection of their children compared with 33 percent of families in the USA as reported by Mitchell, Finkelhor, and Wolak (2005). Parents with younger children (9-15 years) were more likely to install filtering software.

Table 2 Reasons for not installing Internet Filtering Software (IFS) by Sample of the Public in Kuwait

	Number	Percent
Will Install?		
Yes	041	13
No	277	87
Total	318	100%
Reasons for not installing IFS		
Trust ISPs	137	49.4
Trust Government	069	25.0
Trust Children	022	08.0
Freedom	019	06.8
Ineffective IFS	017	06.1
Censorship	013	04.7
Total	277	100%

Concerning the reasons for not installing IFS, about 50 percent of the respondents trust their Internet Service Providers who will use whatever they need to protect the people and the children from accessing inappropriate materials on the Internet.

Only 87 percent of the respondents trust that their children will not access harmful materials on the Internet because of the way they raise them. Less than seven percent believe in freedom of choice and are willing to let their children practice their freedom to access or not to access such materials. On the other hand, more than six percent believe that these software are ineffective in blocking websites and less than five percent believe that these software are another type of censorship that they oppose.

In conclusion, it was clear that the majority of the people sampled in this study are not aware of the existence of Internet filtering software they can install in their home computers. Even after being aware of the role and importance of such IFS, the majority is still unwilling to install these programs for different reasons. More than 70 percent trust their government or Internet service providers. On the other hand around 30 percent of the sampled people trust their children, believe in freedom of choice or consider IFS ineffective and another type of censorship.

7. Discussion: Internet Filtering: Protection or Censorship

Most of the sites targeted for blocking in the Middle East, for example, are selected because of cultural and religious concerns about morality. Political filtering, however, is the common denominator in the region. Bahrain, Jordan, Libya, and Syria focus their filtering efforts primarily on political content. Iran, Oman, Saudi Arabia, Sudan, Tunisia, the United Arab Emirates, and Yemen, on the other hand, not only extensively filter political content but also pervasively block content that is perceived to be religiously, culturally, or socially inappropriate. Regional and internal political conflicts are also behind content blocking. For example, Syria blocks all websites supporting Muslim brotherhoods and Morocco blocks Web sites arguing for the independence of Western Sahara.

Internet censorship in the Middle East and North Africa is multilayered, relying on a number of complementary strategies in addition to technical filtering, arrest, intimidation, and a variety of legal measures are used to regulate the posting and viewing of Internet content (Noman, 2009). Many intellectuals see the problem from a political point of view. They argue that the United States of America is the strongest advocate of democracy and freedom all over the world. The US is encouraging and enforcing democracy and freedom on developing countries, pressuring other regimes to adopt them, and taking punitive measures against countries that are considered undemocratic or oppressing their people by preventing them from freely accessing information among other things. At the same time the US is the strongest supplier of the majority of Internet filtering software to anti-democratic regimes to help them prevent their citizen from the freedom to access information freely and consequently denying them their intellectual freedom. The majority of the ISPs in the Middle East, for example, rely on commercial filtering software, primarily titles produced by U.S.-based companies like Secure Computing and Websense. To one degree or another, some Middle Eastern countries such as the Gulf States, Iran, Sudan, Tunisia, Egypt, and Yemen, block content related to pornography, homosexuality, dating, and provocative attire. Some of these countries also censor topics considered sensitive or forbidden under Islam, such as gambling, alcohol, and drugs, along with Web sites that feature nudity, even if in a non-erotic context. A few countries, such as Saudi Arabia and the United Arab Emirates, ban access to Web sites that are critical of Islam and those that promote conversion to Christianity. While no one can object to the filtering and blocking of pornography, hate violence and terror sites on the Internet, many warn against expanding the use of these software to oppress people and prevent them from exercising their rights of free access to information as part of their intellectual freedom (McCarthy, 2011).

8. Conclusion

It is clear that the majority of families in the state of Kuwait rely heavily on their government and ISP companies for the protection of their children from harmful materials on the internet. The low level of awareness of the availability of filtering software instigates a public awareness campaign in all media including newspapers, radio and television and nowadays social media. However, the most worrisome outcome is one in which filtering creeps into the system in an ad hoc way, without formal evaluation of the standards by which it is taking place or the criteria by which ISPs choose to accede to such filtering when the requests are informal, or an ability to fully evaluate the nature of the sites filtered (Zittrain, 2003).

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Text Mining Analysis of Academic Libraries' Tweets



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Abstract

This study applies a text mining approach to a significant dataset of tweets by academic libraries. The dataset for this research was collected from the complete Twitter timelines of ten academic libraries. The total dataset comprised 23,707 tweets with 17,848 mentions, 7625 hashtags, and 5974 retweets. Academic libraries from the dataset have typically posted fewer than 50 tweets per month, though tweet volume grew rapidly in late-2013 through 2014. The results show variance between academic libraries in distribution of tweets over time. The most frequent word was "open," which was used in a variety of contexts by the academic libraries. It was noted that the most frequent bi-gram (two-word sequence) in the aggregated tweets was "special collections". The most frequent tri-gram (three-word sequence) was "save the date". The most frequent word categories in the semantic analysis for most libraries were related to "knowledge, insight, and information concerning personal and cultural relations". The most common category of the tweets was "Resources" among all the selected academic libraries. These findings highlight the importance of using data- and text-mining approaches in understanding the aggregate social data of academic libraries to aid in decision-making and strategic planning for patron outreach and marketing of services.

Introduction

As a contribution to the literature of social media in academic libraries, this study employs a variety of content analysis techniques to manually and automatically code tweet content (i.e., the content of libraries' individual Twitter posts). Large-scale automated content analysis allows libraries to benchmark their Twitter usage (specifically, their tweet posting content) against their peers in an effort to determine what content types might drive user engagement and interaction. It also highlights the importance of using data- and text mining approaches in understanding the aggregate social data of academic libraries. This research is an initial investigation that provides useful insights and introduces a text-mining methodology for future research.

Objectives & Research Questions

This study applies the text mining approach to ten academic libraries from top global universities, in order to describe their use of Twitter, and to analyze their tweet content. The study aims to answer the following questions:

1. How often do academic libraries use Twitter?
2. What type of content is posted by academic libraries on Twitter?
3. What are the themes associated with academic libraries' tweets?

Methodology

The dataset for this research was collected from the complete Twitter timelines of 10 academic libraries (i.e., all Tweets since joining the platform). Text-mining and content analysis techniques were used in the analysis of the libraries' history of tweets. Then, the cleaned tweets were opened and tokenized in PamTAT, a text-mining tool developed by the Pamplin College of Business at Virginia Polytechnic Institute and State University (Virginia Tech).



Results

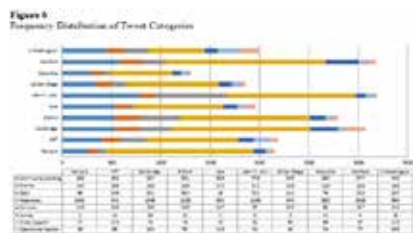
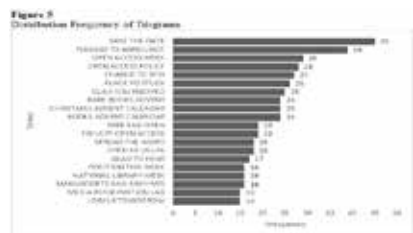
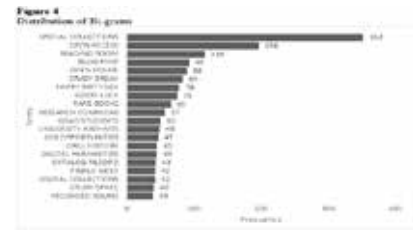
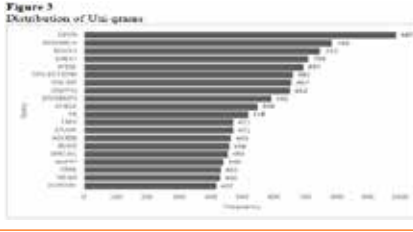
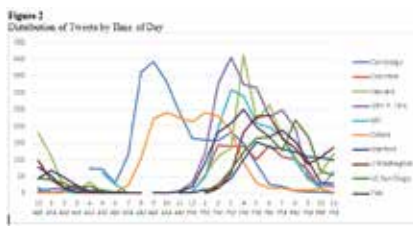
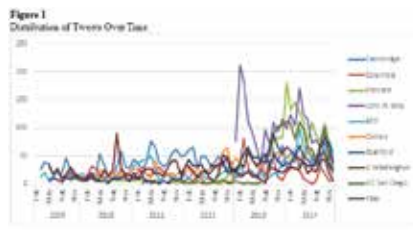
- > The most frequent word was "open," which was used in a variety of contexts by the academic libraries.
- > It was noted that the most frequent bi-gram (two-word sequence) in the aggregated tweets was "special collections".
- > The most frequent tri-gram (three-word sequence) was "save the date".
- > The most frequent word categories in the semantic analysis for most libraries were related to "knowledge, insight, and information concerning personal and cultural relations".
- > The most common category of the tweets was "Resources" among all the selected academic libraries.

Table 1
Description of Academic Libraries' Twitter Accounts

Library name	Followers	Following	Retweets	Mentions	Tweets (account)
Harvard University	2277	2008	12700	144	Jul-09
Stanford University	3770	3130	5787	304	Apr-07
MIT	2844	185	10700	134	Mar-08
Cambridge University	5514	148	9164	4	Mar-08
Columbia University	1313	148	2387	40	Aug-09
University of Oxford	3818	156	23900	18	Apr-06
Yale University	1993	116	4890	38	Apr-08
University of California San Diego	1874	739	988	440	Mar-08
University of Washington	2689	231	2847	141	Apr-08
Johns Hopkins University	3968	371	449	2087	Aug-09
Total	27580	4827	74143	2383	

Table 2
Comparison of Mentions and Hashtags among the Academic Libraries

Library name	Tweets	Mentions	Hashtags	Retweets
Cambridge University	3976	1403	410	473
Columbia University	1305	923	673	233
Harvard University	2154	650	3674	90
Johns Hopkins University	3120	3900	373	822
MIT	2190	1283	701	414
University of Oxford	2795	2544	1100	901
Stanford University	3177	3904	3042	3960
University of Washington	2021	1037	377	452
University of California San Diego	1837	1144	3219	491
Yale University	1942	650	58	528
Total	23707	17448	7625	3874



Conclusion

- > This study has shown that a text-analytics approach can be adopted in the analysis of academic libraries' social media data.
- > This approach is key to information discovery and has the potential to enhance the libraries' resources and services.
- > Academic libraries might consider investing in data- and text-mining applications to help them analyze their postings, benchmark against the postings of other libraries, and evaluate their users' satisfaction and level of engagement.
- > The real-time data available from social media offers a wealth of information that could be used toward enhancing and developing library and information resources and services.

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The Use of Social Networks in Government for Building Social Capital, Social Inclusion, and Social Equality

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Abstract

This study aims to investigate public perceptions in Kuwait regarding the use of social media networks in government where social capital is built to achieve social inclusion. 610 individuals in Kuwait were surveyed, using questionnaire method that included constructs of social capital, social inclusion and social equality. The empirical data revealed that the social capital dimensions have significant associations with both social inclusion and social equality. Moreover, the study proposes a social capital, social inclusion, and social equality model for decision makers and officials when advising the use of social media networks to communicate with the public.

Introduction

In the recent past, public participation in governments has been declined to a great extent, as citizens have been isolated from community life and their ability to articulate demands for good government has been noticeably decreased. However, the Internet has introduced new forms of interaction that could enhance different types of relationships, including government-public relationship. In fact, technology-enabled government has become a catalyst for enabling social inclusion. This exploratory study seeks to investigate public perceptions in Kuwait regarding the use of social media networks in government where social capital is built to achieve social inclusion. Social capital has been defined as social networks and connections amongst individuals, that are based on shared trust, ideas and norms, enable participants of a network to act effectively to pursue a shared objective.

Objectives

The aim of this research is to explore the perceptions of the public in Kuwait towards the use of social media networks in government. The specific objectives are to:

- identify the dimensions of social capital (bridging, bonding, maintaining);
- explore the relationship between building social capital and social inclusion and social equality; and
- explore the relationship between public social inclusion and social equality.

Methodology

The quantitative method was used to generate empirical evidence. The questionnaire survey was designed to address the research objectives and reflect the identified constructs: social capital dimensions (bridging, bonding and maintaining social capital), social inclusion, and social equality. After tested in a pilot study for reliability and validity, the final version of the questionnaire, was distributed among a random sample of 750 subjects in Kuwait. A total of 610 responses were obtained, yielding a response rate of %81.3. Statistical tests were performed to analyze data, such as Factor Analysis, Correlation, and Path Analysis, using SPSS ver. 23. Table 1 shows the demographic characteristics of the research sample.

Table 1: The Demographic Characteristics of the Research Sample

Demographics		Frequency	Percent
Gender	Male	223	36.7
	Female	384	63.3
Age	20-25	230	38.3
	26 -30	123	20.5
	31 -35	102	17.0
	36 - 40	63	10.5
	40 - above	83	13.8
Education	High School	113	19.0
	Diploma	142	23.9
	University Degree	290	48.8
	Graduate Degree	49	8.2
Nationality	Kuwaiti	541	89.1
	Non-Kuwaiti	66	10.9
Internet proficiency	Poor	44	7.3
	Good	282	46.9
	Very good	275	45.8

Implications and Conclusions

- The study confirms that bridging, bonding, and maintaining are vital dimensions of social capital, and using social media applications by the government to interact with the public enhances participation and reduces isolation, supporting previous theoretical, practice, and research conclusions.
- The model developed in this research has created a foundation for further research investigating the use of social media networks in governments of developing countries. Future research could, for example, investigate the role of ICT in addressing some of the core issues associated with social inclusion and social equality.
- The study represents a stand-alone contribution to the academic and policy-oriented debate on the relationship between social capital, ICT, social inclusion, and social equality. The model proposed could serve as a guideline for decision makers and officials when advising the use of social media networks to communicate with the public.

Results

Results indicate, as shown in Table 2, that are strong positive associations between bridging, bonding and maintaining social capital with social inclusion. Also, there is a strong positive association between social inclusion and social equality. Furthermore, all dimensions of social capital (bridging, bonding, and maintaining) have strong positive associations with both social inclusion and social equality.

Table 2: The Correlation between Social Capital Dimensions and Social Inclusion and Social Equality

	Social Equality	Social Inclusion	Bridging Social Capital	Bonding Social Capital	Maintaining Social Capital
Social Equality	1.0				
Social Inclusion (p-value)	0.75 (0.000)	1.0			
Bridging SC (p-value)	0.65 (0.000)	0.68 (0.000)	1.0		
Bonding SC (P-value)	0.69 (0.000)	0.78 (0.000)	0.69 (0.000)	1.0	
Maintaining SC (p-value)	0.70 (0.000)	0.78 (0.000)	0.64 (0.000)	0.84 (0.000)	1.0

Proposed Model

The proposed model constructs of 5 dimensions: Exogenous variables of bridging social capital, bonding social capital, and maintaining social capital, and the endogenous set of variables which includes social inclusion and social equality.

The path analysis shown in Figure (1) provides detailed results of the direct effect of bridging, bonding, and maintaining social capital on social inclusion and social equality. Moreover, the model yields strong direct effect between social inclusion and social equality (41% (0.000)).

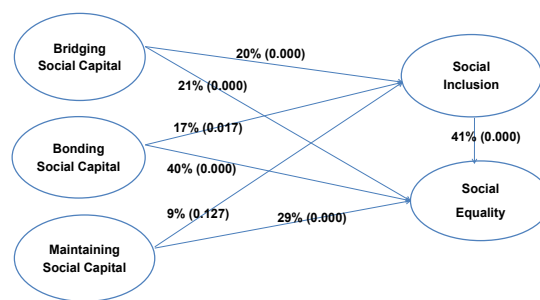


Figure 1: The Proposed Research Model

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التطور السياسي والاقتصادي قبل 4000 سنة في جزيرة فيلكا (الكويت): دراسة أثرية أنثروبولوجية كيميائية معدنية لفخاريات العصر البرونزي

د. حسن جاسم أشكناني 1 ، ميسون الناصر 2 ، منال حسن 2، عبداللطيف عبدالرزاق 3

1 أستاذ الأنثروبولوجيا - قسم علم الاجتماع - كلية العلوم الاجتماعية جامعة الكويت 2 كلية العلوم الاجتماعية 3 كلية الآداب

1. الملخص

تعود أهمية الفخار كمادة أثرية إلى أنها تقدم معاني اقتصادية واجتماعية وسياسية ودينية إلى جانب وظيفتها الأساسية كمادة تخزين وتقديم أطعام والسوائل. لذلك تهدف هذه الدراسة إلى تقييم أهمية الفخار الدلموني ومدى ارتباط صناعته مع السلطنة السياسية في جزيرة فيلكا من خلال تطبيق نظرية التماثل في صناعة المواد البدوية **Standardization and Craft Production** - كأول بحث علمي عن فخاريات حضارة دلمون من موقع الخضز الأثري في جزيرة فيلكا من 2000 قبل الميلاد، والتعرف أيضاً على أي فخاريات غير محلية باعتبارها مادة جذبت حكام الجزيرة والطبقة المميزة وذلك باستخدام جهاز **pXRF** للتعرف على التكوين الكيميائي واستخدام صفائح المايكروسكوب **Microscopic thin section** للتعرف على تماثل صناعة الفخار المحلي.

2. المقدمة

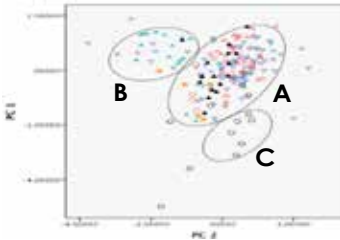
تقع جزيرة فيلكا على بعد 18 كلم من مدينة الكويت (شكل 1) حيث شهدت نشاطاً حضارياً منذ العصر البرونزي (3000 - 1000 قبل الميلاد) الذي يُعتبر من أهم العصور في تاريخ البشرية حيث شهد قيام حضارات عديدة مثل الحضارة الفرعونية (مصر) والسومرية (العراق) ودلمون (البحرين والكويت) وهارابا (الهند) وماجان (عمان)، كما شهدت نشاطاً تجارياً نشيطاً بين مختلف الحضارات والثقافات وظهور الأنظمة السياسية والمؤسسات الدينية والطبقية الاجتماعية. تعتبر حضارة دلمون التي برزت منذ 2600 قبل الميلاد من أهم المراكز الثقافية في منطقة الخليج العربي خصوصاً في البحرين حيث اتخذت عاصمة لها وشملت فيما بعد جزيرة فيلكا في شمال الخليج العربي في دولة الكويت، كما حرص حكامها على تدعيم مكاتهم من خلال جلب المواد والفخاريات النادرة من مناطق بعيدة أو من سيطرتهم على بعض الصناعات المهمة مثل الاختام.

4. طريقة البحث

- تنظيف 90 قطعة فخارية من التراب والبقايا المترسبة بسبب الزمن.
- تصنيف القطع الفخارية إلى مجموعات حسب اللون المماثل.
- استخدام جهاز **Tracer III-V Portable X-Ray Fluorescence** (شكل 2) وذلك عن طريق وضع الكسر الفخارية على أعلى فتحة «مخرج الشعاع» لمدة 60 ثانية للحصول على معلومات كمية ونوعية كافية للعناصر الكيميائية **(Ba), zirconium (Zr), rubidium (Rb), niobium (Nb), thorium (Th), strontium (Sr) and yttrium (Y)** التي شهدت فاعليتها في التفريق بين المواد الأثرية وتصنيفها كل حسب طبيعة الطين المستخدم في كل منطقة.
- اختيار 25 قطعة من ضمن 90 قطعة لفحص صفائح المايكروسكوب.



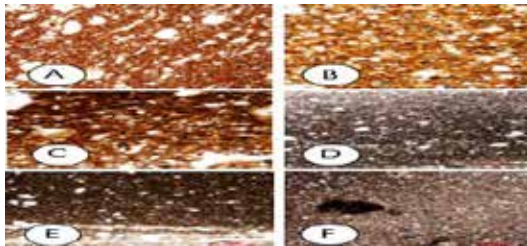
شكل 1: خريطة جزيرة فيلكا في الكويت وموقع الخضز في النجم الأحمر



شكل 3: استخدام PCA لتقييم المجموعات الفخارية حيث تظهر 3 مجموعات رئيسية



شكل 2: جهاز pXRF حيث توضع القطعة في الأعلى عند مخرج الشعاع



شكل 4: صور لصفائح المايكروسكوب باستخدام الترددات المتوتبة Polarized light

3. أهداف الدراسة

- استخدام نظرة بحثية متكاملة تجمع علم الأنثروبولوجيا وعلم الآثار مع علم الكيمياء والمعادن والإحصاء لتقييم ارتباط صناعة الفخار بالسلطة السياسية من خلال تطبيق نظرية التماثل في صناعة المواد البدوية (الفخار مثلاً).
- تقييم فاعلية جهاز الأشعة السينية الغير مدمر **Non-destructive Portable X-Ray** مدمر **pXRF** قاعدة بيانات حول المركبات الكيميائية.
- تقييم نتائج جهاز الأشعة السينية من خلال استخدام صفائح المايكروسكوب **Microscopic thin section** للتأكد من المجموعات الكيميائية والتشف عن طريقة صناعة الفخار بشكل أوضح مثل درجة الحرارة ونوع الأفران.
- التشف عن ارتباط صناعة الفخار مع السلطنة السياسية حيث كلما زاد التماثل زادت السيطرة المركزية على بعض الصناعات البدوية المهمة مثل الفخار والاختام (Højlund 1987).

5. النتائج والخاتمة

- مقدرة الجهاز على الفصل بين الفخاريات المعطورة في موقع الخضز حيث تم التعرف على 3 مجموعات رئيسية (شكل 3): A - مجموعة الفخار المحلي B - مجموعة الفخار الأخضر (العراق) C - مجموعة الفخار الكريسي (شمال العراق).
- وجود 3 قطع فخارية لا تنتمي لأي مجموعة مما سبق، وتتميز بالصلاية بسبب درجة الحرق العالية ومصنوعة بطريقة أفضل من الجميع ولعل لونها الأحمر الداكن يرمز إلى فخار الهند، وتشير إلى انضمام فيلكا في عملية التجارة في العصر البرونزي وحصول طبقة اجتماعية معينة في الجزيرة على فخاريات غير محلية.
- نتائج صفائح المايكروسكوب (شكل 4) أوجدت 3 مجموعات طينية متماثلة مع نتائج الأشعة السينية، ولكن تنوع في طين والمواد الأولية في الفخار المحلي الدلموني (طين غني بالحديد مع مايكسا وحببيبات رملية A, B, C، طين بدون حببيبات، طين مع حببيبات بركانية E + D)، بالإضافة إلى طين غير محلي F.
- تنوع المواد الأولية وطريقة حرق الفخار ودرجات الحرارة في الحرق يشير إلى عدم وجود تماثل في صناعة الفخار الدلموني (شكل 5) بناءً على عتبات هذه المواقع على الأقل مما يعكس عدم وجود سيطرة مركزية على هذه الصناعة البدوية كما في حضارة الوركاء والعبيد في العراق.



شكل 5: بالزغم من تماثل الشكل الخارجي للفخاريات الدلمونية إلا أن التركيب الكيميائي والصناعة وإعداد المادة غير مماثل مما يعكس المستوى الفردي أو المحلي في صناعة الفخار بدلاً من المستوى المركزي، وأفضل مثال في الوقت الحاضر للتماثل والمركزية هي الصلوات المعدنية والورقية.

6. الدراسات المستقبلية

الحصول على عدد أكبر من العينات من مواقع أثرية في الكويت من العصر البرونزي ومن دول الخليج العربي ومقارنتها مع نتائج هذا البحث.

المصادر
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شكر وتقدير
نتقدم بالشكر والتقدير لكل من جامعة الكويت ومؤسسة الكويت للتقدم العلمي وجامعة ساوث فلوريدا والمجلس الوطني للثقافة والفنون والآداب لتسهيل البحث العلمي من خلال تقديم الدعم المالي والمواد اللازمة للبحث والأجهزة والمختبرات.



برامج الوقاية من الإساءة الجنسية لطلبة وطالبات مرحلة رياض الأطفال: استطلاع آراء ومعتقدات واتجاهات الرأي العام في الكويت

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قسم الاجتماع والخدمة الاجتماعية كلية العلوم الاجتماعية

ملخص

هدفت الدراسة إلى استطلاع آراء ومعتقدات واتجاهات الرأي العام المتعلمة بفضايا برامج الوقاية من الإساءة الجنسية للأطفال في دولة الكويت. تكونت عينة الدراسة المحصنة من 320 مشاركاً موزعين على محافظتين الكويت. وفي ضوء الواقع المحلي لفضايا الإساءة الجنسية على الأطفال، والأدبيات المحلية والعالمية المتعلقة بموضوع البحث، فقد تضمنت الدراسة مجموعة من التساؤلات حول مدى تأثير النوع والعمر والحالة الاجتماعية وما إذا كان المشترك قد سبق له التعرف على الموضوعات مع الأطفال كمتغيرات للتحقق من المتغير التابع وهو مدى نقل المشاركين لفكرة تطبيق برامج الوقاية من الإساءة الجنسية للأطفال. بالإضافة إلى استطلاع لأهم المعلومات والمهارات والسلوكيات التي يتناولها الإباء مع الأطفال مجال التحرش الجنسي. أعدت الباحثة ملحق المسح الاجتماعي بالبحوث واستخدام الأسلوب الوصفي في تحليل بيانات الدراسة وخروجت الدراسة بعدد من النتائج، وعلى ضوء هذه النتائج قدمت الدراسة بعض التوصيات والمقترحات فيما يتعلق بعمليات الرعاية الاجتماعية، بالإضافة إلى المجالين التطبيقي والنظري.

مقدمة

ويتم العنف الجنسي ضد الأطفال ويشكله الميول المختلفة سواء كان اعتداء أو إساءة جنسية أو اغتصاب أو استغلال في ذمته أو مواد إباحية انتهاكاً جسيماً لحقوق الطفل، وواقعياً عالمياً في كافة البلدان وبين جميع الفئات الاجتماعية ينسب متفاوتة ففي عام 2002، أشارت تقديرات منظمة الصحة العالمية إلى أن 150 مليون فتاة و 73 مليون صبي دون سن 18 سنة قد أجبروا على ممارسة العنف الجنسي أو غيره من أشكال العنف الجنسي التي تنطوي على اتصال جسدي. وفي دولة الكويت، وعلى الرغم من أنه لا توجد حتى الآن دراسة استقصائية وطنية واسعة النطاق على مدى انتشار حالات الإساءة الجنسية على الأطفال، إلا أن عدداً من الدراسات المحلية استناداً إلى عيّنات من الطلاب في المراحل المختلفة ودراسات تحظى بمحتوى الحالات المحولة لمراكز الطوارئ الطبية للأطفال في المستشفيات تشير إلى وجود هذه الحالات، مما يدعو إلى أهمية تسليط الضوء عليها لتفهم طبيعتها ووضع التصورات الملائمة للتعامل معها.

ومع توافر البحوث النظرية والتطبيقات النظرية الحديثة حققت نسبة كبيرة من هذه الإساءة الجنسية على الأطفال تحتل أعلى من المعايير، فقد برزت الحاجة إلى إعداد برامج الوقاية للأطفال مرحلة ما قبل المدرسة، ولا يقتصر على الجميع إلا حاج إلى برامج لوقائية في رياض الأطفال وور العمل الخاصة ببناء اعتماداً كبيراً على مدى دعم الرأي العام وأولياء الأمور تلك البرامج والتزامهم بمبعضها ورسلتها. ومن هنا جاءت أهمية إجراء الدراسة.

أهداف الدراسة

هناك عدد محدود من دراسات استطلاع آراء ومواقف ومعتقدات الرأي العام في جميع أنحاء العالم، وعند أقل من تلك الدراسات في منطقة الشرق الأوسط وشبه الجزيرة العربية، وليس هناك أي دراسة في دولة الكويت، لذلك، تهدف الدراسة لتطبيق العنصر المعرفية والنظرية والتطبيقية من خلال محاولة لإجابة على عدد من الأسئلة يمكن تلخيصها بالتالي:

1. ما مدى إقبال الوالدين أو مقامي الرعاية للطفل على الحديث مع أطفالهم عن فضايا الإساءة الجنسية؟
2. ما هو مضمون تلك الأحاديث أو النقاشات؟
3. ما أسباب عدم التطرق لمواضيع الإساءة الجنسية مع الأطفال؟
4. هل هناك فرق بين من يناقش فضايا الإساءة الجنسية مع أطفالهم مع من لا يناقشها من حيث التنقل للبرامج الوقائية، ومحتويات تلك البرامج؟
5. ما مدى موافقة المشاركين مع طرح الموضوعات المختلفة للاعتداء الجنسي على الأطفال في برامج الوقاية؟
6. ما هي معتقداتهم حول الآثار المحتملة لتطبيق برامج الوقاية على الطفل؟

منهجية البحث

العينة
عينة الدراسة هي عينة حاسوبية غير احتمالية -بحسب محافظة السكن- أرقامها 320 مشاركاً. تم توزيع الاستبيانات ورسالة تشرح الغرض من الدراسة وضمان سريتها في موقع مختلفة على عيّنات الطلاب، الجامعات، والوزارات الحكومية والمراكز التجارية والمهنية في محافظتي دولة الكويت الست. وكان معدل الاستجابة 785.5٪ وزرع عدد 400 استبيان، استكمل منها 342، وتم تجاهل 58 استبياناً لعدم استكمال المعلومات الجيدة من (جدول 1) ويوضح وصف العينة ونسبة المشاركين الذين سبق وأن تحدثوا مع أطفالهم عن الموضوعات في الاستبيان والإساءة الجنسية.

القياسات
استخدمت الباحثة استبانة لقياس الإجابة على تساؤلات الدراسة بعدد برامجة مقياس لأحداث المحلية والعالمية السابقة في مجال برامج الوقاية من الإساءة الجنسية للأطفال لاستطلاع آراء حول الموضوع.

تتضمن الاستبانة على سبعة أقسام (أ) المعلومات الديموغرافية وسؤال ما إذا كان المشترك قد تحدث في أي وقت مضى إلى أطفاله حول فضايا متعلقة بالإساءة الجنسية على الأطفال (ب) عبارات (ب) الموضوعات المختلفة التي تمت مناقشتها مع الأطفال (ج) بنود ألفا كرونياب (0.88)، احتمالات لشخص المتدني (ج) بنود، ألفا كرونياب = (0.77)، والمهارات التي عليها المشاركون لأطفالهم (بنود، ألفا كرونياب (0.98))، (ج) أسباب عدم التحدث مع الأطفال بنود الشان (أسباب)، (د) المعتقدات بشأن المخاطر والتفرد من مختلف مفاهيم الوقاية / موضوعات (18 بنود، ألفا كرونياب = (0.57)، (هـ) المعتقدات بشأن المخاطر والتفرد من مختلف مفاهيم الوقاية (10 بنود ألفا كرونياب = (0.68). (ز) حول أول من ينبغي أن يقدم برامج الوقاية (بند واحد) و (3) سؤال عما إذا كان المشاركون سيسمحون لأطفالهم بالتحدث في برامج الوقاية (بند واحد) فيما عدا الأسئلة الديموغرافية لقياس الاتجاه (النوع والحالة الاجتماعية والمهنية) على الإجابة على جميع البنود إما بعدم أو لا، أو موافق / غير موافق مع العبارات والمعتقدات **صدق الاستبانة** و**مؤلفها**، لذلك من مدى الإجابة عرضت على عدد من المشاركين، ومن ثم عدلت بعض العبارات وفقاً لملاحظتهم. أما النتائج فقد قيس باستخدام معامل ألفا كرونياب (تراوحت بين (0.96 - 0.7).

الإجراءات
تم استخدام منهج المسح الاجتماعي العلمية المصممة -بحسب التوزيع السكاني لكل محافظة- لإجابة عن تساؤلات الدراسة وتحقيق أهدافها. واعتمدت الدراسة على استخدام استبانة وجهت لمواطنين كويتيين في عينة الدراسة. فبعد إعداد القائمة للأسئلة الأولية للاستبانة، تم عرضها على مجموعة من أساتذة قسمي الاجتماع والخدمة الاجتماعية وقسم علم النفس في جامعة الكويت للتأكد من مستوى الصدق الظاهري Face Validity لمحتويات استبيان الدراسة، وركزت في المرحلة الأولى على خمسين مواظناً، وبعد الإجابة عليها من قبلهم، جُمعت وتم مراجعتها ومراجعتها مع مجموعة المتخصصين الأربعة ومدى فهمهم لمستوى الاستبانة، ثم أدرجت بعض التعديلات الطفيفة على بعض كلمات العبارات، ومن ثم أعد صياغة الاستبانة في صورتها النهائية على ضوء الملاحظات، ومن ثم بدأت المرحلة الثانية والحاسمة بتوزيع الاستبانة على عيّنات المحسنة المختارة بحسب المناطق السكنية للموعدة في محافظات الكويت الست (زرع عدد 400 استبياناً). وقد قام بتوزيع الاستبانات عدد من طلبة تخصص الخدمة الاجتماعية -الفرقة الرابعة- من جامعة الكويت على قبلة الباحة على كيفة تحت إشراف أفراد المشاركة باستكمال بيانات وأسئلة الاستبانة المعلقة بالتاكيد على سرية البيانات واستمالة حول هوية المشاركين من خلال نسبة لأهمية موضوع الدراسة وحساسيتها بالنسبة للمجتمع الكويتي. وقد جُمعت البيانات في سنة 2015 خلال فترة ثلاثة أشهر (سبتمبر-نوفمبر).

التعليق على الاستبانة
تم استخدام التعليق الوصفي باستخدام التكرارات والنسب المئوية والمتوسطات الحسابية لوصف العينة وللإجابة على بعض تساؤلات الدراسة، كما تم استخدام اختبار كاي لإجابة على تساؤلات الملائمة بين متغيرات الدراسة.



النتائج

جدول (1): وصف العينة ديموغرافياً وتنتج من 1: ما مدى إقبال الوالدين أو مقامي الرعاية للطفل على الحديث مع أطفالهم عن فضايا الإساءة الجنسية؟

النسبة	التكرار	المتغيرات الديموغرافية
49.9%	157	الفرقة
51.1%	163	الجنس
35.6%	114	الحالة الاجتماعية
57.9%	184	المهنة
5.3%	17	مستوى
1.6%	5	العمر
31.6%		متوسط الأعمار
37.8%	121	هل سبق وأن تحدثت مع طفلك عن فضايا الإساءة الجنسية؟
62.2%	199	مستوى التحصيل الدراسي
		الفرقة
		الجنس
		الحالة الاجتماعية
		المهنة
		مستوى
		العمر
		متوسط الأعمار

جدول (2): 2: ما هو مضمون أحاديث ونقاشات أولياء الأمور مع أطفالهم بموضوع التحرش الجنسي؟

%	الإجابية / نعم	التحذيرات
80.2%	97	الموضوعات التي تم مناقشتها مع الطفل
82.6%	100	قد يحاول أحد الأشخاص أن يمس أو يتمسك أعضاء الخاصة
84.3%	102	قد يحاول أحد الأشخاص أن يمس أو يتمسك أعضاء الخاصة
84.3%	102	قد يحاول شخصاً ما اغتصابه بالهدايا أو الهدايا ولاصطناعية لطفله
84.3%	102	قد يحاول شخصاً ما اغتصابه بالهدايا أو الهدايا ولاصطناعية لطفله
33.1%	40	قد يحاول أحد الأشخاص أن يمس أو يتمسك أعضاء الخاصة
33.1%	40	قد يحاول شخصاً ما اغتصابه بالهدايا أو الهدايا ولاصطناعية لطفله
33.1%	40	قد يحاول شخصاً ما اغتصابه بالهدايا أو الهدايا ولاصطناعية لطفله
91%	91	احتمال أن يكون المعتدي
75.2%	61	أحد أفراد الأسرة
75.2%	61	شخص بالغ يعرفه الطفل
62.8%	76	طفل آخر غير شواهد مراقب
62.8%	76	طفل آخر غير شواهد مراقب
30.6%	37	أحد الأصدقاء
30.6%	37	أحد الأصدقاء
2.5%	3	أحد الوالدين
2.5%	3	أحد الوالدين
5.8%	7	أحد الأصدقاء
5.8%	7	أحد الأصدقاء
90.9%	110	التهديدات التي تحدثت عنها
90.9%	110	التهديدات التي تحدثت عنها
79.3%	96	أحد الوالدين عن أية مشكلة تصادها
79.3%	96	أحد الوالدين عن أية مشكلة تصادها
90.1%	109	هل (لا) يحزم وثيقة أو ملف أو كارتون
90.1%	109	هل (لا) يحزم وثيقة أو ملف أو كارتون
93.4%	113	اصرخ عاليًا عندما أُرغبت في التحرش
93.4%	113	اصرخ عاليًا عندما أُرغبت في التحرش
61.2%	74	قد يوجه أحد المعتدين تهديدات
61.2%	74	قد يوجه أحد المعتدين تهديدات

جدول (3): 3: ما أسباب عدم التطرق لموضوع الإساءة الجنسية مع الأطفال؟

%	التكرار	السبب
36.2%	72	لم يناقش الموضوعات على ما يلي
25.6%	51	مفاتيح لزيارات مساهمة، جذاً لاستيعاب الموضوع
20.1%	40	لا أعرف كيف يمكن شرح الموضوع لطفلي
8%	16	ليست لدي المعلومات الكافية عن الموضوع
10.1%	20	مناقشة هذه الموضوعات مع طفلي قد تزعجه
2.5%	5	طفلي يمانع من هذا الموضوع
2.5%	5	طفلي يمانع من هذا الموضوع
7.5%	15	المحل من تناول الموضوع مع طفلي
7.5%	15	المحل من تناول الموضوع مع طفلي
3.5%	7	مناقشة تلك الأمور مع طفلي ضد معتقداتي العلمية ويتناقض معها
3.5%	7	مناقشة تلك الأمور مع طفلي ضد معتقداتي العلمية ويتناقض معها

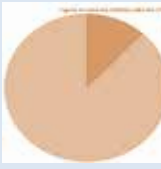
من 4: هل هناك فرق بين من يناقش فضايا الإساءة الجنسية مع أطفالهم مع من لا يناقشها من حيث التنقل للبرامج الوقائية، ومحتويات تلك البرامج؟

- بالمقارنة بين المشاركين الذين ناقشوا الإساءة الجنسية (N = 121)، أولئك الذين لم يناقشوا مع أطفالهم (N = 199)، أظهرت النتائج أن معتقداتهم حول ما يجب أن يدرس في برامج الوقاية كانت إيجابية و متشابهة لكلاً للمجموعتين (16.71 مقابل 16.47، P = 0.14).
- أما بالنسبة لمعتقدات المشاركين من تحدثوا مع أطفالهم (M = 4.76، SD = 2.28)، ومن لم يتحدثوا معهم (M = 4.62، SD = 1.90) حول الآثار الإيجابية المحتملة لبرامج الوقاية من الإساءة الجنسية، نسبة التوقات الإيجابية بين المجموعتين.
- نتائج التوقيتات الإيجابية بين المجموعتين، حيث توجد فروق دالة إحصائية بين المجموعتين، حيث لوحظ ارتفاع على الأطفال في تلك النتائج على عدم وجود فروق دالة إحصائية بين المجموعتين، حيث لوحظ ارتفاع نسبة التوقات الإيجابية بين المجموعتين.
- لا تختلف ما إذا كان هناك اختلاف في إمكانية للنساء لأطفالهم بالمشاورة في برامج الوقاية بين المشاركين الذين ناقشوا فضايا CSA مع أطفالهم والذين لم يناقشوا مع أطفالهم عن إساءة جنسية. وأظهرت النتائج أن العلاقة بين هذه المتغيرات لم تكن كبيرة، حيث أظهرت كلا المجموعتين اهتمام متساو في المساح لأطفالهم بأن يكونوا جزءاً من برامج الوقاية من الإساءة الجنسية للأطفال (موافقة 91.7%، 86% بالترتيب).

من 5: ما مدى موافقة المشاركين مع طرح الموضوعات المختلفة للاعتداء الجنسي على الأطفال في برامج الوقائية؟
أظهرت النتائج نتائجاً عاماً مع جميع الموضوعات المطروحة، مع شيء من التحفظ على موضوعين هما تعليم الأطفال التمييز بين التحرش بالأذى البدني عن أنفسهم، وكذلك موضوع هيبية الأطفال نصياً لا احتمال عدم تصديق البالغين لهم حال شكواهم من معاملة التحرش بهم.

جدول (5): من 6: ما هي معتقداتهم حول الآثار المحتملة لتطبيق برامج الوقاية على الطفل؟

الموضوع	أوافق %	لا أوافق %
هذه البرامج ستساعد على منع حالات الإساءة الجنسية للطفل	93.4%	6.6%
هذه البرامج تؤدي إلى خوف الطفل من جميع الغرباء	35.3%	64.7%
هذه البرامج ستساعد الطفل على اختلاق التصمن حول حالات إساءة هيبية لم تحدث.	34.4%	65.6%
هذه البرامج يشجع الطفل بالخوف من محض ولين وتقبل الوالدين له.	20.6%	79.4%
هذه البرامج ستجلب من الصعب على الطفل الثقة بأي شخص.	36.9%	63.1%
هذه البرامج ستخلق طفلاً وثقاً بنفسه وقادراً على التصرف في حال تعرضه لأي إساءة أو تحرش جنسي.	90.9%	9.1%
هذه البرامج غير مناسبة للأطفال مرحلة رياض الأطفال والحضانة لسفر من الأطفال عن استيعابها.	70.3%	29.7%
هذه البرامج مفيدة ومهمة فقط للأطفال الإناث وليس الذكور.	10.9%	89.1%
الأطفال من بيئة متدينة ليسوا بحاجة لمثل هذه البرامج لأنهم يعلمون من أي تحرش أو إساءة جنسية.	12.2%	87.8%
يجب أن يشارك جميع أطفال من ما قبل المدرسة في مثل هذه البرامج لأهميتها.	62.5%	37.5%



الاستنتاجات والتوصيات

- ينتج من نتائج الدراسة وجود نتائج واعدة وأفكاراً لتطبيق البرامج الوقائية للطلاب مرحلة رياض الأطفال في أوقات العينة والتي تباينت من حيث المرحلة العمرية والحالة الاجتماعية والوعي كما أظهرت وتعدت إيجابية للآثار المحتملة للبرامج على الأطفال، مما يهدد الطريق للبدء بإعداد نماذج لبرامج الوقاية من التحرش الجنسي للأطفال وتطبيقها تجريبياً على نطاق ضيق لدراسة مخرجها.
- عززت العلاقة بين أفراد العينة أسباب عدم تحدثهم مع أطفالهم بفضايا وموضوعات الوقاية من التحرش الجنسي إلى حقيقة أن تلك الموضوعات لم تحدث بينهم، أو أنهم لا يعرفون كيفية التحدث مع أطفالهم بشأنها إما لقلّة معلوماتهم أو الجهلهم بكيفية التعامل مع الموضوع.
- كما والحصرت غالبية التوجهات الوقائية للمشاركين لأطفالهم على ما يمكن تسميته بـ "خطر الغريب" stranger-danger، وهي رؤية محدودة التنبؤ. غالبية الدراسات عدم سلاحتها، حيث أظهرت الدراسات أن الغالبية العظمى من جرائم الإساءة والتحرش الجنسي بالأطفال مرتبطة باختلاف داخل المنزل ومن قبل أشخاص يعرفهم الطفل وثق بهم.
- نستنتج من هذه النتائج أن الإساءة الجنسية للأطفال، وتزويدهم بالمعلومات والحقائق المرتبطة بتلك التصايا، تمهيداً لإشراكهم ببرامج الوقاية كخطوة مستقبلية.



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مؤشرات تخطيطية لتطوير الأنشطة الطلابية في كليات جامعة الكويت

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ملخص البحث

تعد الأنشطة الطلابية التي تنظمها عمادة شؤون الطلبة بجامعة الكويت بيئة نموذجية خصبة لتعمية مواهب الطلاب وصقل ملكاتهم وقدراتهم في شتى المجالات الفنية والأدبية والفكرية والعلمية وغيرها ، وتزودهم بالخبرات والمعلومات والمعارف التي تيسر لهم آفاق أوسع ، وتشكل الأنشطة الطلابية رافداً ترويضاً معزراً ومثيراً للعملية التربوية التعليمية من خلال الاهتمام والرعاية والدعم الذي تقدمه جامعة الكويت لفئة الطلبة الموهوبين ، وبالرغم من ذلك المحاولات والجهود التي تبذلها جامعة الكويت في مجال الأنشطة الطلابية ، إلا أن تلك الجهود لم تصل إلى الأهداف المرجوة منها ، وقد لاحظت الباحثة بحكم طبيعة عملها بجامعة الكويت واحتكاكها بالطلاب والإشراف على الأنشطة الطلابية ، انتشار ظاهرة عزوف الطلاب عن المشاركة في الأنشطة الطلابية ، وانخفاض عدد الطلاب المشاركين في الأنشطة مقارنة بأعداد الطلاب بالجامعة ومن هذا المنطلق تبلورت مشكلة البحث في التساؤلات الآتية :

ما الواقع الفعلي لممارسة الأنشطة الطلابية بكلية جامعة الكويت ؟
 ما المعوقات التي تواجه تحسين وتطوير الأنشطة الطلابية بكلية جامعة الكويت ؟
 ما المؤشرات التخطيطية لتطوير الأنشطة الطلابية بكلية جامعة الكويت ؟

وقد أسفرت نتائج الدراسة عن أهم المعوقات التي تحول دون تحسين وتطوير الأنشطة الطلابية بكلية جامعة الكويت من وجهة نظر الطلاب والمدرشين على الأنشطة هي :
 معوقات مرتبطة بإدارة النشاط الطلابي المتمثلة في : ضعف الدعم المالي والموارد المالية المخصصة للصرف على الأنشطة من بنود الميزانية المخصصة ، مع انخفاض الدعم الفنى وعدم وجود خطة واضحة للنشاط ، علاوة على عدم أماكن ممارسة الأنشطة على مقر الكليات وصعوبة الوصول إليها .

معوقات تتصل بمشرفي الأنشطة الطلابية المتمثلة في : ضعف المستوى المهني لبعض مشرفي النشاط وقلّة المهاره والخبرة ، و كثرة الأعباء الإدارية عليهم وتوليم الإشراف على أكثر من نشاط ، و نمطية الخطة وقلّة المدربين المتخصصين وعدم توافر الخبرة اللازمة لتنفيذ خطط النشاط .

معوقات تتصل بالطلاب المشاركين في الأنشطة المتمثلة في : ضيق وقت الطلاب وسبب كثرة المقررات الدراسية ووجود صعوبة في الموازنة بين ممارسة النشاط والانضباط في المحاضرات وقلّة الحوافز المادية والمعنوية للطلاب المتميزين في النشاط ، علاوة على العادات والتقاليد المعارضة لمشاركة الطلاب في الأنشطة وخاصة الطالبات . وانتهت الدراسة على وضع مؤشرات تخطيطية للمساهمة في إعادة صياغة بيئة الأنشطة الطلابية مقومواً ومضموناً وممارسة في كليات جامعة الكويت .

أهداف البحث

الكشف عن الواقع الفعلي لممارسة الأنشطة الطلابية بكلية جامعة الكويت .
 الوقوف على المعوقات التي تحول دون تحقيق الأنشطة الطلابية لأهدافها بكلية الجامعة
 اقتراح بعض المؤشرات التخطيطية لتطوير الأنشطة الطلابية بكلية جامعة الكويت .

منهجية البحث

تدرج الدراسة تحت الدراسات الوصفية التحليلية باستخدام منهج المسح الاجتماعي .

أدوات البحث

استمارة استبيان آراء الطلاب المشاركين في الأنشطة الطلابية
 مقاربات شبه مننقة مع مشرفي والمسؤولين عن الأنشطة الطلابية

مجالات البحث

المجال المكاني : بعض الكليات النظرية والعلمية التابعة لجامعة الكويت.
 المجال البشري : مشرفي الأنشطة الطلابية وعمادة شؤون الطلاب بكلية جامعة الكويت وعدهم مشرفين مشرفها ومسؤولا .

* العينة الدراسة وتكون من معمارسة الأنشطة الطلابية وهم (٤٠٥) طالب وطالبة.

نتائج البحث

جدول ١ توزيع عينة الدراسة وفقا للنوع	النوع	النكرار	النسبة المئوية
الجنس			
ذكر	162	40	
أنثى	243	60	
الإجمالي	405	100	

جدول 2 بوضوح توزيع مقررات عينة الدراسة حسب نوع النشاط الطلابي	النوع	النكرار	النسبة المئوية
النشاط			
اجتماعي	142	35	
رياضي	129	32	
فني	84	21	
ثقائلي	50	12	
الإجمالي	405	100	

جدول ٣ بوضوح المعوقات تحول دون تطوير الأنشطة الطلابية بجامعة الكويت ن = 405	ك	%
م. الصعوبات		
١. المعوقات من جانب إدارة النشاط الطلابي		
1 ضعف الدعم المالي والموارد المالية المخصصة للصرف على الأنشطة	83	20
2 مواءمة ممارسة الأنشطة لا تتناسب مع الظروف الدراسية للطلاب	77	19
3 الضور على عمل الدعاية الجاذبة للطلاب أو الإعلان عن الأنشطة	48	12
4 الإعانات لتأتمن ممارسة النشاط مهلكة واحتياج إلى التحديث	74	18
5 عدم أماكن ممارسة الأنشطة على مقر الكليات وصعوبة الوصول إليها	25	6
6 انخفاض الدعم الفنى وعدم وجود خطة واضحة للنشاط	65	16
ب. معوقات تتصل بمشرفي الأنشطة الطلابية		
1 فرض المشرفين بعض الأنشطة بعينها على الطلاب	66	16
2 وجود صعوبة وتحيز من جانب بعض المشرفين مع الطلاب المشاركين	47	12
3 ضعف المستوى المهني لبعض مشرفي النشاط / قلّة المهاره والخبرة .	85	21
4 عدم وجود متخصصين في التعامل لممارسة الأنشطة .	35	9
5 كثرة الأعباء الإدارية وتولّي الإشراف على أكثر من نشاط/ قلّة عدهم	75	19
6 سلبية بعض المشرفين في إقناع الطلاب بالمشاركة في الأنشطة.	33	8
7 إنقائ مسؤولية تنفيذ النشاط بأكمله على قلّة من الطلاب دون توجيه.	49	12
ج. معوقات تتصل بالطلاب المشاركين في النشاط		
1 اعتقاد التمايز بين أقسام الكليات المختلفة في وضع وخطة الأنشطة الطلابية	26	6
2 العادات والتقاليد المعارضة لمشاركة الطلاب في الأنشطة وخاصة الطالبات.	96	24
3 قلّة الحوافز المادية والمعنوية للطلاب المتميزين في النشاط	67	17
4 خلل بعض الطلاب من المشاركة لانهم يكتفون بممارسة النشاط	58	14
5 ضيق وقت الطلاب لكثرة المقررات الدراسية مع ضعف المحاضرات .	134	33
6 عزوف كثير من الطلاب نتيجة لعدم الإقناع وعدم جاذبية الأنشطة	89	22
7 ضعف التواصل بين مشرفي النشاط الطلابي أثناء التنفيذ	78	19

جدول ٤ بوضوح مقترحات روى الطلاب في تطوير الأنشطة الطلابية ن = 405	ك	%
م. المقترحات		
١. مقترحات فنية وإدارية		
1 تجديد الهياكل وتحديث صالات النشاط والأدوات المستخدمة	220	54
2 زيادة المخصصات المالية لتخطيط وتنفيذ الأنشطة الطلابية	98	22
3 تشجيع الطلاب على المشاركة بالنشاط بشئى الوسائل الجاذبة	70	17
4 توفير كادر إداري مهني ومدرب ومؤهل لتقادة النشاط .	59	11
5 تمل صالات ممارسة الأنشطة الى داخل الكليات بدل الأماكن البعيدة	53	10
ب. مقترحات خاصة بالطلاب		
1 تنظيم الجداول الدراسية بما يسمح لممارسة أنشطة الطلاب	160	40
2 زيادة الحوافز والمكافآت للطلاب المتميزين .	110	27
3 تنمية الوعي الطلابي بأهمية النشاط والمشاركة له .	62	15

جدول 5 بوضوح المعوقات التي تواجه المسؤولين والمشرفين في تطوير الأنشطة الطلابية ن = 20	ك	%
م. الصعوبات		
١. معوقات إدارية		
1 ضعف الميزانيات المرصودة للأنشطة الطلابية .	18	90
2 نقص مهارات وخبرات القائمين على إعداد خطة النشاط .	7	35
3 عدم وجود خطة متكاملة لجميع الأنشطة على مدار العام الدراسي .	5	25
4 البيروقراطية الإدارية وكثرة الإجراءات لإتمام النشاط مع الإدارة	10	50

ب. معوقات مرتبطة بالطلاب	ك	%
1 ضيق وقت الطلاب لكثرة المقررات الدراسية .	17	85
2 عزوف كثير من الطلاب نتيجة لعدم الإقناع أو الخجل .	7	65
3 تقاسم دور إدارة النشاط في دعم الطلاب المشاركين / قلّة الحوافز.	5	25
4 تمتد بعض المساعدة من الطلاب المشاركين وحرمانهم من الدرجات	11	55

ج. معوقات مرتبطة بالإشراف	ك	%
1 كثرة الأعباء الإدارية وتولّي الإشراف على أكثر من نشاط .	14	80
2 قلّة عدد المشرفين مقارنة بالطلاب المشاركين .	12	60
3 ضالة المكافآت والحوافز المرصودة للإشراف .	8	40
4 عدم كفاية الصلاحيات المخوطة لمشرفي النشاط .	3	25
5 ضعف المستوى المهني لبعض مشرفي النشاط المتخصصين .	3	15

جدول 6 بوضوح أهم مقترحات المسؤولين والمشرفين في تطوير الأنشطة الطلابية ن = 20	ك	%
م. المقترحات		
١. مقترحات مرتبطة بالإدارة		
1 زيادة الدعم المالي للأنشطة وتوفير بنود للصرف	18	90
2 توفير القاعات والأجهزة المتطورة لممارسة الأنشطة	15	75
3 توفير كادر إداري مهني ومؤهل لوضع خطط الأنشطة وتحديثها .	12	60
4 استحداث برامج وأنشطة تتواءم مع متطلبات العصر .	9	45
5 تخصيص اللجان إعطاء الطلاب المشاركين درجات للتميز	7	35
ب. مقترحات مرتبطة بالطلاب		
1 تميز الطلاب المشاركين بالحوافز والمكافآت المادية والمعنوية .	13	65
2 تنمية الوعي الطلابي بأهمية النشاط والدعوة له بطرق جاذبة .	11	55
3 تنظيم الجداول الدراسية بشكل يسمح بإوقات ممارسة الأنشطة	8	40
4 تكثيف الاهتمام بصقل مواهب الطلاب وإعطائهم حرية الإبداع.		
ج. مقترحات مرتبطة بالإشراف		
1 تأهيل مشرفي النشاط على التقنيات الحديثة بالدورات التدريبية	15	75
2 زيادة عدد المشرفين المؤهلين وذوي الخبرة	9	45
3 الاهتمام بوضع أفرقة لتهيئة الطلاب أثناء ممارسة النشاط.	6	30
4 تحديد أسلوب الممارسة المهنية وطرق التعامل مع الطلاب .	8	40

مستخلصات البحث

أسفرت نتائج البحث عن وضع مؤشرات تخطيطية مقترحة تعمل على الحد من المعوقات التي تواجه ممارسة الشباب الجامعي للأنشطة الطلابية في كليات جامعة الكويت هي :

المؤشر الاجتماعي

- تشكيل لجنة في كل كلية لمتابعة مجريات الأنشطة الطلابية وعمل النسب الإحصائية لعدد المترددين على كل نشاط ومدى المهارات التي استمادتها على مدار كل شهر والمعوقات التي واجهتهم وأدت لعدم مواصلة نشاط ما بعد أن انتهوا به.
- عمل لجان من الطلاب وفق كل نشاط ويعطى لكل طالب نشاط بطاقة بمنصب (مساعد مشرف نشاط) لتحفيز الطالب كميّار أدبي على الاستمرارية في هذه اللجنة من ناحية ، و محور جذب لبقية زملائه بالكليات من جانب آخر .
- تكوين لجنة فرعية من الطلاب المشاركين في الأنشطة مع المشرفين بكل كلية لتولى مهمة الدعاية والإعلان المستمرة عن الأنشطة والمسابقات والاحتفالات التي تقوم بها كل لجنة نشاط على حده لجميع طلاب الكليات بالجامعة.

المؤشر المعرفي

- تشجيع الطلاب باقتراح أنشطة متجددة تتواءم مع العصر، بل وربط الأنشطة الطلابية ببعضها البعض لإيجاد مزيد من التفاعل بين الأنشطة من ناحية والتواصل الاجتماعي بين الطلاب المشاركين لها بعضهم البعض من ناحية أخرى .
- تصميم اختبارات لاجتياز كل نشاط يرغب الطالب في الالتحاق به ، فذلك يضفي مزيد من الجدية حول دور لجان الأنشطة في اكتشاف واختيار مواهب الطلاب ثم تنمية هذه المواهب وصقلها على مدار العام .
- إنشاء قاعدة بيانات عن كل نشاط من الأنشطة الطلابية بكل كلية ونبذة عامة عن أهداف نشاطها والإنجازات التي حققتها ، وإبراز الطلاب الذين حققوا بطولات بها ، ومن قام بتدريبهم والإشراف عليهم .

المؤشر الثقافي

- تشجيع الطالبات على المشاركة في الأنشطة الطلابية وتحفيزهن على الالتحاق بها مع زملائهن الطلاب في إطار من التنافس القائم على الاحترام والرفق المتبادل في التعامل بينهم ، ولا سيما الأنشطة الثقافية والمنطارات.
- إيجاد آلية مع القائمين على العملية التدريسية لمنح الطلاب المشاركين في الأنشطة الطلابية " درجات أعمال السنة " حتى لا يشعرون أن ممارستهم للأنشطة الطلابية غير مفيد أو ضائعة للوقت

المؤشر الاقتصادي

- زيادة تمويل الأنشطة والاهتمام بتخصيص مكافآت مجزية للطلاب الفائزين وكذلك المستمزين في ممارسة الأنشطة بكفاءة وفاعلية على مدار العام .
- إعلاء القائمين على الأنشطة الطلابية التفضيل المناسب في إدارة وتنفيذ أنشطتهم وتبسيط الإجراءات والتباعد عن الروتين الإداري والمالي والصرف على الأنشطة بما يكفل تنفيذ الأنشطة في الوقت المناسب وبما يحقق الأهداف المنشودة .
- الاهتمام بالإشراف المالي على النشاط لا يجب أن يتم وفق اعتبارات من بينها ، الاقتصاد في النفقات ، ومراجعة الحسابات الختامية أولاً بأول ، وبفضل إشراك الطلاب المشاركين في الإشراف المالي على النشاط بما يهيئ فرصة تدريبية جيدة لإكسابهم مهارات تتعلق بتخطيط ووضع الميزانية ، والمتابعة والرقابة عليها .

توصيات البحث

- الاستعانة بالخبراء والمتخصصين من القيادات الجامعية في عمادة شؤون الطلبة وأعضاء هيئة التدريس بالجامعة في مجال الأنشطة الطلابية لوضع السياسة العامة والتخطيط لممارسة الأنشطة الطلابية على مدار العام الدراسي .
- توفير الكوادر البشرية المؤهلة والمتخصصة للإشراف الإداري والفني من (الإداريين – العاملين – الفنيين) لحماية الطلاب عن تعرضهم لأي أضرار أو إصابات أثناء ممارستهم للأنشطة الطلابية
- أهمية تخصيص الميزانيات الكافية لتوفير الأبنية الأساسية لممارسة الطلاب للأنشطة الطلابية في إطار الاستخدام المرن للمساحات ومراعاة إحداث أي تطورات في المستقبل تطوير أداء مشرفي الأنشطة الطلابية في كليات جامعة الكويت من خلال عقد ورش عمل لتنفيذ الأنشطة الطلابية، تكثيف الدورات التدريبية التخصصية للمشرفين والإطلاع على تجارب وخبرات الدول الأخرى في مجال تطوير الأنشطة الطلابية .

* علما بأن البحث غير مغول من أي جهة بحثية وقد تم اجازته ونشره في مجلة مركز بحوث الشرق الأوسط - جامعة عين شمس عدد سبتمبر للعام ٢٠١٦



الفروق بين الجنسين في الإبعاد الثقافية العالمية لدى المعلمين الكويتيين



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الملخص: تهدف الدراسة الحالية إلى التعرف على الفروق بين الجنسين في الإبعاد الثقافية العالمية لدى المعلمين الكويتيين ، وذلك على عينة من معلمين ومعلمات المرحلة الثانوية من العاملين بوزارة التربية قوامها (540) معلم، بواقع (270) فرد من الذكور و (270) فرد من الإناث، تراوحت أعمارهم ما بين (25، 34) سنة، طبق عليهم نموذج مسح القيم "هوفستيدا" . وكشفت النتائج عن وجود فروق دالة بين متوسطات الذكور والإناث على نموذج مسح القيم ، حيث حصلت الإناث على متوسط أعلى من متوسط الذكور في بعدي مسافة القوة ، والتوجه طويل المدى ، وتجنب عدم التأكد، وأن الذكور حصلوا على متوسط أعلى من متوسط الإناث في بعدي الفردية والذكورة . ولم تكشف النتائج عن فروق ذات دلالة احصائية بين الذكور والإناث في بعد تجنب عدم التأكد .

جدول (2) المتوسط والاحتراف المعياري وقيم (ف) و(ت) للذكور والإناث

المقاييس	النوع	ن	المتوسط	الانحراف المعياري	ف	ت	مستوى الدلالة
مسافة القوة	ذكور	270	8.05	1.49	7.06	4.48	.000
	إناث	270	8.7	1.85			
الفردية	ذكور	270	6.01	1.94	2.04	2.95	.003
	إناث	270	5.5	2.08			
الذكورة	ذكور	270	7.51	1.18	2.04	2.77	.006
	إناث	270	6.96	2.38			
تجنب عدم التأكد	ذكور	270	9.15	2.07	6.09	1.2	---
	إناث	270	8.92	2.37			
التوجه طويل المدى	ذكور	270	6.91	2.79	4.1	4.13	.000
	إناث	270	8.02	3.39			

الاهداف: تتلخص الأهمية النظرية للدراسة في تفسير الفجوة في الدراسات السابقة بطرحها أسلوباً جديداً نسبياً ولمقياس لم يتم التطرق له بشكل تفصيلي في التراث النفسي العربي، وهي الأبعاد الثقافية العالمية - حيث تعد هذه الدراسة أول دراسة محلية وعربية تهدف إلى التعرف على الأبعاد الثقافية لدى عينة من المعلمين في وزارة التربية الكويتية، فضلاً عن التعرف على الفروق بين عينات الدراسة وفق لمغير النوع . أما عن فروض الدراسة فهي النحو التالي :

1- متوسط الأبعاد الثقافية العالمية لدى المعلمين الذكور أعلى من متوسط الأبعاد الثقافية العالمية لدى المعلمين الإناث.

(منهجية البحث)

أولاً : العينة: شملت الدراسة على (540) معلم ومعلمة من الجنسية الكويتية بواقع (270) فرد من الذكور و (270) فرد من الإناث تتراوح أعمارهم بين (25، 34) عاماً . وكان متوسط الأعمار لعينة الذكور الكويتيين (28.95). كما أن متوسط الأعمار لعينة الإناث الكويتيات (28.20).

ثانياً : الأدوات :

نموذج مسح القيم (8) (Values Survey Module, VSM): المقياس الأصلي الذي وضعه 'هوفستيدا' وتم ترجمته لعدة لغات (Roodt,2003,pp.75-82). ويتكون من (28) بند (20) بند بواقع 4 بنود لكل بعد من الأبعاد الثقافية العالمية وباقي البنود أسئلة شخصية) ولقد صيغت خيارات الإجابة على البنود بطريقة ليكرت من (1-5) هي : (1) في غاية الأهمية (2) مهم جداً (3) أهمية متوسطة (4) أهمية ضئيلة (5) أهمية لا تذكر . جدول (1) يوضح قيم معاملات الثبات لمقياس مسح القيم على عينة الدراسة

جدول (1) قيم معاملات ألفا كرونباخ لمقياس مسح القيم

المقاييس	إناث	ذكور	عينة الكلية
مسافة القوة	ن=270	ن=270	ن=540
الفردية	ن=270	ن=270	ن=540
الذكورة	ن=270	ن=270	ن=540
تجنب عدم التأكد	ن=270	ن=270	ن=540
التوجه طويل المدى	ن=270	ن=270	ن=540

ثالثاً : الإجراءات :

تم الحصول على إذن خطي من جامعة الكويت - كلية الدراسات العليا وكذلك من وزارة التربية، وقام الباحثان بجمع البيانات عن طريق تطبيق مقياس الأبعاد الثقافية العالمية على عينات كويتية من معلمي وزارة التربية بعد أخذ الموافقة، وتمت عملية التطبيق من خلال الاتصال المباشر بأفراد العينة وتشجيعهم على تعبئة بنود المقاييس، وسيكون التطبيق بصورة جماعية في أقسام المعلمين في المدارس.

رابعاً : التحليل الإحصائي: تم إدخال البيانات في الحاسب الآلي ومعالجتها إحصائياً باستخدام الحزم الإحصائية للعلوم الاجتماعية SPSS لحساب مايلي :- معاملات الارتباط لتقدير الثبات لنموذج مسح .

- تحليل التباين الأحادي واختبار ت للمقارنة بين مجموعات الدراسة .

النتائج:

افترض الباحثان أن متوسط الأبعاد الثقافية العالمية لدى المعلمين الذكور أعلى من متوسط الأبعاد الثقافية العالمية لدى المعلمين الإناث، وللتحقق من صحة هذا الفرض قام الباحثان باختبار التصميم الإحصائي باستخدام تحليل التباين الأحادي (ف) واختبار (ت). ويتضح من النتائج الواردة في جدول (2) وجود فروق دالة إحصائية بين الذكور والإناث ، حيث حصلت الإناث على متوسط أعلى من متوسط الذكور في بعدي مسافة القوة ، والتوجه طويل المدى ، وتجنب عدم التأكد، وأن الذكور حصلوا على متوسط أعلى من متوسط الإناث في بعدي الفردية والذكورة . ولم تكشف النتائج عن فروق ذات دلالة احصائية بين الذكور والإناث في بعد تجنب عدم التأكد .

التوصيات :

- حث الباحثين على إجراء دراسات جديدة تتناول متغيرات نفسية غير مستخدمة في هذه الدراسة وبحث علاقتها مع الأبعاد الثقافية العالمية .
- إجراء مثل هذه الدراسة على عينات أخرى غير المعلمين من أفراد المجتمع مثل الطلبة والأطباء والمهندسين وغيرهم .

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(مصدر تمويل البحث)

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تصور الانتحار لدى عينة من طلبة الجامعة

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المخلص

تهدف الدراسة إلى معرفة طبيعة العلاقة بين تصور الانتحار وكل من الاكتئاب واليأس لدى عينة من طلبة جامعة الكويت، فضلاً عن التعرف على مدى انتظام تلك المتغيرات في عامل استكشافي أحادي القطب لدى أفراد العينة تكونت عينة الدراسة من (1000) طالب وطالبة من طلبة الجامعة، بواقع (285) من الذكور و (715) من الإناث واستعين بالآليات التالية: مقياس "بيك" لتصور الانتحار BSS، وقائمة "بيك" الثانية للاكتئاب BDI-II ومقياس "بيك" لليأس BHS، كشفت نتائج الدراسة عن وجود علاقة ارتباطية موجبة بين تصور الانتحار وكل من اليأس (r= 0.62) والاكتئاب (r= 0.56)، كما كشفت النتائج عن وجود معاملات تشابه بين عوامل الذكور والإناث في تصور الانتحار، كما كشفت النتائج أيضاً عن استخلاص عامل استكشافي أحادي القطب من تلك المتغيرات.

أهداف الدراسة

- 1- التعرف على طبيعة العلاقة بين كل من تصور الانتحار واليأس والاكتئاب التي ينبغي أن تنتظم في عامل استكشافي أحادي القطب.
- 2- التعرف على مكونات تصور الانتحار لدى كل من الذكور والإناث .

منهجية البحث

تم استخدام المنهج الوصفي الارتباطي المقارن، حيث يتم فيه بحث العلاقة بين تصور الانتحار وكل من الاكتئاب واليأس وذلك من خلال حساب معامل الارتباط للمتغيرات الدراسة فضلاً عن استخدام التحليل العاملي الاستكشافي لاستخلاص العوامل المشتركة التي تصف العلاقة بين هذه المتغيرات.

العينة: تكونت عينة الدراسة من (1000) طالب وطالبة من طلبة جامعة الكويت خلال العام الدراسي 2014/2015 تم اختيارهم بطريقة عشوائية وفقاً لمعادلة "روبرت ماسون" فكان العدد الكلي للعينة الأصلية (1000) وبعد استبعاد الاستبيانات غير السليمة أو التي لا يشملها أهداف البحث، فأصبح عدد عينة الذكور للدراسة (285) طالب وعينة الإناث (715) طالبة.

أدوات الدراسة

- 1- مقياس "بيك" لتصور الانتحار (BSS) Beck Scale for Suicide Ideation يتكون مقياس بيك لتصور الانتحار من (21) بند لاكتشاف وقياس التقرير الذاتي الحالي للمرضى في حالات معينة مثل المواقف والسلوكيات والخطوط لإتمام الانتحار خلال الأسبوع الماضي. يختبر BSS الإصدار المطور للتقرير الذاتي لإدارة المقابلة بمقياس تصور الانتحار، يحتوي البنود 19 الأولى للمقياس على 3 خيارات وفي كل شدة ومكثفة للانتحار، يتم تقييم الدرجات من حيث الشدة إلى 3 نقاط من (0-2) وقد تم وضع هذه التقييمات لإنتاج النتيجة الإجمالية والذي يصل إلى الحد من (0-38) درجة.
- 2- قائمة "بيك" الثانية للاكتئاب (BDI-II) Beck Depression Inventory-II تعتبر قائمة "بيك" الثانية للاكتئاب BDI-II أحدث صورة مطورة لقائمة "بيك" الأولى المعدلة للاكتئاب BDI-I وتتكون القائمة من (21) بنداً، مستخدماً أسلوب التقرير الذاتي لقياس شدة الاكتئاب لدى المرشحين والمبالغين بدءاً بسن 13 عاماً.
- 3- مقياس "بيك" لليأس (BHS) Beck Hopelessness Scale يعتبر مقياس "بيك" لليأس من إعداد بيك، ستيير (Beck & Steer, 1974)، ونشر في أصله الإنجليزي وفي عام 1988 صدرت الطبيعة الثانية للمقياس دون أي تعديل أو إضافة بالنسبة لعدد البنود أو نوعيتها، ويتكون المقياس من (20) بنداً، تم صياغتها بطريقة سهلة ومختصرة، يجيب عليها باختبار إجابية واحدة من إجابيتين (نعم-لا)، وترافق من درجات المقياس بين (0-20).

الإجراءات

أجرى الباحثان طريقتين لحساب الثبات لمقياس الدراسة وهما معامل ألفا "كرونيباخ" ولحساب ثبات الاتساق الداخلي عن عينة قوامها (251) فرد من طلبة جامعة الكويت بواقع (100) فرداً من الذكور و (151) من الإناث، وطريقة إعادة التطبيق بعد أسبوع من التطبيق الأول لحساب ثبات الاستقرار على عينة قوامها (30) من طلبة جامعة الكويت.

التحليل الإحصائي

طبقت المقاييس ومجموعات الارتباط المتعددة بين مقياس "بيك" لتصور الانتحار (BSS) ومقياس أخرى على عينة من طلبة الجامعة (n= 855) من طلبة الجامعة باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS) لتحليل البيانات إحصائياً وأجريت التحليلات الإحصائية التالية لتحقيق أهداف الدراسة : اختبار معاملات ارتباط المستقيم بيرسون لحساب الثبات والعلاقة بين متغيرات الدراسة، فضلاً عن التحليل العاملي الاستكشافي بطريقة الألويمين المتغيرات الدراسة.

النتائج

نتيجة الفرض الأول: نص الفرض الأول على انه توجد علاقة ارتباطية بين تصور الانتحار وكل من الاكتئاب واليأس. ولاختبار صحة هذا الفرض حسب معامل الارتباط بين درجات أفراد العينة في كل من تصور الانتحار والاكتئاب واليأس والجدول رقم (2) يوضح ما توصل إليه من نتائج

تشير النتائج في جدول (2) إلى وجود ارتباط جوهري موجب بين تصور الانتحار وكل من اليأس والاكتئاب، وأسفر التحليل العاملي لمصفوفة معاملات الارتباط بين الدرجة الكلية لتصور الانتحار ومقياس اليأس والاكتئاب عن ظهور عامل أحادي القطب، بحيث تشعب تشعبات جوهرياً موجبة لكل من اليأس والاكتئاب على تصور الانتحار، وقد استوعب نسبة مرتفعة من التباين الكلي نتيجة الفرض الثاني:

نص الفرض الثاني على أن " لا تختلف مكونات تصور الانتحار باختلاف النوع". قبل حساب مصفوفة معاملات الارتباط المتبادلة قام الباحثان بحساب المتوسطات الحسابية للذكور والإناث وكذلك اختبار "ت" لتحديد جوهرياً الفروق بين المتوسطات على عينة من طلبة جامعة الكويت بواقع (285) من الذكور وواقع (715) وأسفرت النتائج على حصول الإناث على متوسطات أعلى في تصور الانتحار (6.39±7.32) من الذكور (7.46±5.35) وبلغت قيمة ت (2,01) عند مستوى الدلالة (0,05) لذلك قام الباحثان بفصل الذكور عن الإناث ومن ثم استخراج معاملات الارتباط المتبادلة بين بنود المقياس. تم إجراء التحليل العاملي الاستكشافي لمصفوفة معاملات الارتباط المتبادلة بين بنود مقياس "بيك" لتصور الانتحار (BSS) لكل من عينة الذكور وعينة الإناث على حدا وقد خلقت المصفوفة الارتباطية بطريقة هويتلنج المكونات الأساسية لأنها أدق الطرق الرياضية المتأصلة. وقد أدبرت المحاور لتدويراً متلاماً.

أسفر التحليل العاملي الاستكشافي عن استخلاص ثلاثة عوامل رئيسية لعينة الذكور، وثلاثة عوامل لعينة الإناث، وتستوعب هذه العوامل نسبة لا بأس بها من التباين، وسوف نعد التشعب الجوهري للبعد الواحد بالمعامل بأنه < 0,35، على أن تكون هناك ثلاثة تشعبات جوهرياً على الأقل لكل عامل بالإضافة إلى محك الجذر الكامن للعامل $\leq 0,1$ كما هو واضح في الجدول رقم (3).

جدول رقم (3) مصفوفة عوامل مقياس (بيك) لتصور الانتحار (BSS) بطريقتي المكونات الأساسية بعد التدوير الأول على عينة من طلبة جامعة الكويت

العامل	BSS = ن			BSS = ن		
	1	2	3	1	2	3
1	0,87	0,04	0,04	0,87	0,04	0,04
2	0,04	0,79	0,04	0,04	0,79	0,04
3	0,04	0,04	0,84	0,04	0,04	0,84
4	0,04	0,04	0,04	0,04	0,04	0,04
5	0,04	0,04	0,04	0,04	0,04	0,04
6	0,04	0,04	0,04	0,04	0,04	0,04
7	0,04	0,04	0,04	0,04	0,04	0,04
8	0,04	0,04	0,04	0,04	0,04	0,04
9	0,04	0,04	0,04	0,04	0,04	0,04
10	0,04	0,04	0,04	0,04	0,04	0,04
11	0,04	0,04	0,04	0,04	0,04	0,04
12	0,04	0,04	0,04	0,04	0,04	0,04
13	0,04	0,04	0,04	0,04	0,04	0,04
14	0,04	0,04	0,04	0,04	0,04	0,04
15	0,04	0,04	0,04	0,04	0,04	0,04
16	0,04	0,04	0,04	0,04	0,04	0,04
17	0,04	0,04	0,04	0,04	0,04	0,04
18	0,04	0,04	0,04	0,04	0,04	0,04
19	0,04	0,04	0,04	0,04	0,04	0,04
20	0,04	0,04	0,04	0,04	0,04	0,04
21	0,04	0,04	0,04	0,04	0,04	0,04
22	0,04	0,04	0,04	0,04	0,04	0,04
23	0,04	0,04	0,04	0,04	0,04	0,04
24	0,04	0,04	0,04	0,04	0,04	0,04
25	0,04	0,04	0,04	0,04	0,04	0,04
26	0,04	0,04	0,04	0,04	0,04	0,04
27	0,04	0,04	0,04	0,04	0,04	0,04
28	0,04	0,04	0,04	0,04	0,04	0,04
29	0,04	0,04	0,04	0,04	0,04	0,04
30	0,04	0,04	0,04	0,04	0,04	0,04
31	0,04	0,04	0,04	0,04	0,04	0,04
32	0,04	0,04	0,04	0,04	0,04	0,04
33	0,04	0,04	0,04	0,04	0,04	0,04
34	0,04	0,04	0,04	0,04	0,04	0,04
35	0,04	0,04	0,04	0,04	0,04	0,04
36	0,04	0,04	0,04	0,04	0,04	0,04
37	0,04	0,04	0,04	0,04	0,04	0,04
38	0,04	0,04	0,04	0,04	0,04	0,04
39	0,04	0,04	0,04	0,04	0,04	0,04
40	0,04	0,04	0,04	0,04	0,04	0,04
41	0,04	0,04	0,04	0,04	0,04	0,04
42	0,04	0,04	0,04	0,04	0,04	0,04
43	0,04	0,04	0,04	0,04	0,04	0,04
44	0,04	0,04	0,04	0,04	0,04	0,04
45	0,04	0,04	0,04	0,04	0,04	0,04
46	0,04	0,04	0,04	0,04	0,04	0,04
47	0,04	0,04	0,04	0,04	0,04	0,04
48	0,04	0,04	0,04	0,04	0,04	0,04
49	0,04	0,04	0,04	0,04	0,04	0,04
50	0,04	0,04	0,04	0,04	0,04	0,04
51	0,04	0,04	0,04	0,04	0,04	0,04
52	0,04	0,04	0,04	0,04	0,04	0,04
53	0,04	0,04	0,04	0,04	0,04	0,04
54	0,04	0,04	0,04	0,04	0,04	0,04
55	0,04	0,04	0,04	0,04	0,04	0,04
56	0,04	0,04	0,04	0,04	0,04	0,04
57	0,04	0,04	0,04	0,04	0,04	0,04
58	0,04	0,04	0,04	0,04	0,04	0,04
59	0,04	0,04	0,04	0,04	0,04	0,04
60	0,04	0,04	0,04	0,04	0,04	0,04
61	0,04	0,04	0,04	0,04	0,04	0,04
62	0,04	0,04	0,04	0,04	0,04	0,04
63	0,04	0,04	0,04	0,04	0,04	0,04
64	0,04	0,04	0,04	0,04	0,04	0,04
65	0,04	0,04	0,04	0,04	0,04	0,04
66	0,04	0,04	0,04	0,04	0,04	0,04
67	0,04	0,04	0,04	0,04	0,04	0,04
68	0,04	0,04	0,04	0,04	0,04	0,04
69	0,04	0,04	0,04	0,04	0,04	0,04
70	0,04	0,04	0,04	0,04	0,04	0,04
71	0,04	0,04	0,04	0,04	0,04	0,04
72	0,04	0,04	0,04	0,04	0,04	0,04
73	0,04	0,04	0,04	0,04	0,04	0,04
74	0,04	0,04	0,04	0,04	0,04	0,04
75	0,04	0,04	0,04	0,04	0,04	0,04
76	0,04	0,04	0,04	0,04	0,04	0,04
77	0,04	0,04	0,04	0,04	0,04	0,04
78	0,04	0,04	0,04	0,04	0,04	0,04
79	0,04	0,04	0,04	0,04	0,04	0,04
80	0,04	0,04	0,04	0,04	0,04	0,04
81	0,04	0,04	0,04	0,04	0,04	0,04
82	0,04	0,04	0,04	0,04	0,04	0,04
83	0,04	0,04	0,04	0,04	0,04	0,04
84	0,04	0,04	0,04	0,04	0,04	0,04
85	0,04	0,04	0,04	0,04	0,04	0,04
86	0,04	0,04	0,04	0,04	0,04	0,04
87	0,04	0,04	0,04	0,04	0,04	0,04
88	0,04	0,04	0,04	0,04	0,04	0,04
89	0,04	0,04	0,04	0,04	0,04	0,04
90	0,04	0,04	0,04	0,04	0,04	0,04
91	0,04	0,04	0,04	0,04	0,04	0,04
92	0,04	0,04	0,04	0,04	0,04	0,04
93	0,04	0,04	0,04	0,04	0,04	0,04
94	0,04	0,04	0,04	0,04	0,04	0,04
95	0,04	0,04	0,04	0,04	0,04	0,04
96	0,04	0,04	0,04	0,04	0,04	0,04
97	0,04	0,04	0,04	0,04	0,04	0,04
98	0,04	0,04	0,04	0,04	0,04	0,04
99	0,04	0,04	0,04	0,04	0,04	0,04
100	0,04	0,04	0,04	0,04	0,04	0,04

وبالنظر إلى الجدول رقم (3) نلاحظ تشعبات جميع بنود المقياس في ثلاثة عوامل في عينة الذكور حيث احتوت تشعبت معظم بنود المقياس في العامل الأول فيما عدا البنود (11-19) وقد برجع ذلك إلى عدم وضوح البنود كما تشعبت معظم بنود المقياس في العامل الثاني أيضاً فيما عدا البنود (2-5) بالإضافة إلى وجود أكثر من ثلاث تشعبات في العامل الثالث في البنود (11-5-14-19)، واستوعبت نسبة من التباين الكلي بلغت (62%)، أما في عينة الإناث نلاحظ تشعب بنود المقياس أيضاً في ثلاثة عوامل وتشعب معظم بنود المقياس في العامل الأول فيما عدا البنود (11-19-3-5-11-12) بالإضافة إلى وجود أكثر من ثلاث تشعبات في العامل الثاني وكذلك في البنود (1-8-4-6-3-2) والعامل الثالث في البنود (19-11-5)، واستوعبت نسبة من التباين الكلي بلغت (56%).

التوصيات

- 1- إجراء بحوث مستقلة في مجال تصور الانتحار باستخدام مقياس "بيك" لتصور الانتحار (BSS).
- 2- توسيع دائرة البحوث المسحية في مجال تصور الانتحار بحيث تشمل عيناتها طلبة المدارس الثانوية وغيرهم ممن تتراوح أعمارهم بين 15-18 سنة.
- 3- إجراء دراسة عملية بطريقة التحليل العاملي الاستكشافي والتوكيدي معا على عينات مرضية ومقارنتها بعينات سوية.
- 4- توفير مقاييس تساعد على تشخيص كل من الاكتئاب واليأس وتصور الانتحار لإدارات الخدمة النفسية لتخفيف من مشاعر الاكتئاب واليأس لتوقاية من تصور الانتحار.

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مصدر تمويل البحث

البحث غير معمول ومستقل من أطروحة ماجستير مقدمة كلية الدراسات العليا بجامعة الكويت



Gender and Cultural Differences in Depression among Undergraduates from Arabian Gulf Countries



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Abstract: The aim of the current investigation was to explore cultural and gender related differences in Depression using undergraduates recruited from the following countries: Emirates, Iraq, Kuwait, Oman, Bahrain, Qatar, Saudi Arabia, and Yemen (N=3384). Standard Arabic Version of the Beck Depression Inventory-II (BDI-II), was administered to Arabic undergraduates, recruited. Reliabilities ranged from .84 to .91 with a mean .87 (alpha) denoting good internal consistency. The convergent correlations in eight samples between BDI-II and Kuwait University Anxiety Scale KUAS (mean $r = .66$) for validity coefficients. It was found that females had significantly higher mean depression scores than their male counterparts in five countries: Iraq, Kuwait, Oman, Qatar, and Saudi Arabia. However, no significant gender differences were found in three countries: United Arab Emirates, Yemen, and Bahrain. Overall gender differences ($f=9.52, p<.002$), cultural differences ($f=10.79, p<.001$) (and the interaction between both culture & gender ($f=8.56, p<.001$)).

Introduction: Assessing depression within gender and cross-cultural context using a valid and reliable framework would therefore provide significant benefit when selecting and predicting college students. Depression diagnoses has to be made using an individual's gender and culture as a frame of reference. There is very limited cross-cultural data in Arabian Gulf countries using the same instrument

Objectives: The aim of the current investigation was to explore gender and cultural gender related differences in depression using undergraduates recruited from 8 Arabian Gulf countries

METHOD Sample

Standard Arabic Version of the Beck Depression Inventory-II (BDI-II), was administered to Arabic undergraduates, recruited from the following countries: Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, Emirates, Oman, and Yemen (N= 3384). The mean age of the sample was 20.81 ± 1.80 . A 452 Kuwait University students agreed to participate. The BDI-II was mailed to the university rectors in those eight countries (n=3384, 1692 males and 1692 females)

Instruments

Beck Depression Inventory-II (Beck, Steer, and Brown, 1996) consists of 21 items to assess the intensity of depression in clinical and normal patients. Each item is a list of four statements arranged in increasing severity about a particular symptom of depression. Reliabilities ranged from .84 to .91 with a mean .87 (alpha) denoting good internal consistency. The convergent correlations in eight samples between BDI-II and Kuwait University Anxiety Scale KUAS (mean $r = .66$) for validity coefficients

Statistical analyses

We studied the internal consistency of BDI-II and the correlations between BDI-II and KUAS. Subsequently, we carried out the analysis of variance (one-way and two-way ANOVA) to analyze the differences between group means in order to determine the main effect of contributions of each independent variable and to identify if there is a significant interaction effect between gender and culture variables on depression

Results: Reliabilities ranged from .86 to .96 (alpha) for the BDI-II (see table 1). The correlation between the BDI-II & KUAS ranged from .56 to .74 denoting a divergent validity of the scales. It was found that females had significantly higher mean depression scores than their male counterparts in five countries: Iraq, Kuwait, Oman, Qatar, and Saudi Arabia. However, no significant gender differences were found in three countries: United Arab Emirates, Yemen, and Bahrain. Overall gender differences ($f=44.20, p < .001$; Eta Squared=.000), cultural differences ($f=9.05, p < .001$; Eta Squared=.021) and the (interaction between both culture & gender ($f=10.60, p < .001$; Eta Squared=.024

Table (1) Mean (M) , Standard Deviation (SD) f-test of Males and Females , Cronbach's Alpha, and the correlation of the Depression BDI-II with Anxiety KUAS in 8 Countries.

Country	Depression BDI-II						f	Sig	Cronbach's Alpha	r KUAS
	Male			Female						
	N	M	SD	N	M	SD				
IRAQ	362	15.43	9.37	363	20.20	10.54	41.34	.001	.86	.63
KUWAIT	255	12.97	9.72	256	14.96	9.17	5.68	.02	.88	.66
SAUDI ARABIA	315	14.12	11.43	315	18.20	10.09	20.70	.001	.89	.68
QATAR	100	12.28	8.24	100	15.12	9.05	5.38	.02	.87	.56
BAHRAIN	110	15.70	12.75	110	13.10	17.11	0.15	----	.96	.68
OMAN	118	14.25	9.32	118	18.33	9.62	10.91	.001	.87	.74
UNITED ARAB EMIRATES	175	19.29	12.97	176	17.82	11.23	0.55	----	.91	.70
YEMEN	257	15.81	9.20	257	16.33	10.51	0.41	----	.86	.63

Conclusion: Based on the findings, it is safe to conclude that gender differences overshadow similarities. Female preponderance of depression has been a consistent finding within literature. Furthermore, the results revealed a cultural difference in depression where Iraq, United Arab Emirates, Oman and Saudi Arabia had the highest means. The most obvious limitation of the study is the limited age range of the samples (from 18 to 25 year). Furthermore, the studies were conducted with university students only. Thus, an important next step in this endeavor would be to extend the current investigation to another age group

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الذاكرة العاملة لدى الأطفال الكويتيين: دراسة مقارنة بين طلبة المعهد الديني وطلبة المدارس العامة في المرحلة المتوسطة بنين



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الملخص:

تعد الذاكرة العاملة واحدة من أكثر المفاهيم نشاطاً في البحوث المنهجية، والمعرفية العصبية على مدار العقود الأربعة الماضية، ومع ذلك ما زالت الدراسات العربية قليلة في هذا المجال وبخاصة عند الأطفال والدراسة الراهنة أجريت على عينة قوامها 400 طفلاً من الكويتيين متوسط أعمارهم (128,76±6,73) شهراً، بهدف استكشاف الفروق بين طلبة المعهد الديني - المرحلة المتوسطة وبين طلبة المرحلة المتوسطة في المدارس العامة بنين في كل من الذاكرة العاملة اللفظية والبصرية-المكانية، باستخدام البطارية الآلية لمهام الذاكرة العاملة للأطفال من إعداد ألواي، وهي بطارية يتم تطبيقها بواسطة الكمبيوتر، وهي تقيس الذاكرة العاملة وفقاً للنموذج المتعدد المكونات لبيدلي وهينش، وأشارت النتائج إلى وجود فروق دالة إحصائية بين طلبة المعهد الديني وطلبة المرحلة المتوسطة بنين في جميع مهام الذاكرة العاملة بنوعها والدرجات الكلية، ويتفوق طلبة المعهد الديني المتوسط للبنين العاملة اللفظية والبصرية-المكانية على طلبة المرحلة المتوسطة بنين في الذاكرة.

أهداف الدراسة:

تسعى الدراسة الراهنة إلى الكشف عن الفروق النوعية في القدرات المعرفية بين طلبة المعهد الديني وطلبة المدارس العامة للمرحلة المتوسطة بنين في الأداء على مهام الذاكرة العاملة اللفظية والبصرية-المكانية، ومن خلال إيجاد هذه الفروق، من الممكن الوقوف على جوانب القوة والضعف لمرتكبي هذه الأنواع من المدارس وفقاً لمكونات الذاكرة العاملة.

منهجية البحث:

1-العينة:

أجريت الدراسة على عينة قوامها 400 (من الأطفال الكويتيين متوسط أعمارهم (128,76) -، وبالحراف معياري (6,74) شهراً) البالغ (200) طالب من طلبة المعاهد الدينية المتوسطة للبنين، وأخرى قوامها (200) طالب من طلبة المدارس العامة للمرحلة المتوسطة الحكومية للبنين. تم اختيار العينة عشوائياً من محافظة الفروانية والعامصة، وروعي في العينة أن يكونوا من الأطفال الكويتيين والكويتيات أب وأم كويتيين، ويعيشون بشكل مستديم في دولة الكويت، ويتحدثون اللغة العربية بوصفها اللغة الأم، ويحققون معدلات متوسطة أو مرتفعة في التحصيل الدراسي كما تشير السجلات المدرسية، وتم استبعاد الأطفال مزدوجي اللغة، ومدارس التعليم الخاص، وكذلك الأطفال ذوي الإعاقة العقلية، والحرية.

2-أداة الدراسة:

استخدم الباحثان البطارية الآلية لمهام الذاكرة العاملة للأطفال من إعداد ألواي (2007, Alloway)، ولقد قام سليمان بتعريب وتكثيف المقاييس على عينة مصرية (سليمان، 2010) وإيضاً قام بتطبيقها على عينة من الكويت كل من الأنصاري وسليمان (الأنصاري، سليمان، 2013) وفي هذه البطارية يقوم الحاسب الآلي أوتوماتيكياً بتقديم المنبهات وتصحيح الدرجات التلقائياً، وتتضمن البطارية ست مهام تقيس كل من الذاكرة العاملة اللفظية والبصرية-المكانية (الأنصاري، سليمان، 2013) وتقيس هذه البطارية الذاكرة العاملة وفقاً للنموذج المتعدد المكونات لبيدلي وهينش (شكل 1) للتحقق من ثبات المهام المتضمنة في البطارية تم حساب الثبات بطريقة الانساق عن طريق حساب قيم معامل الفجورينغ، وأشارت النتائج إلى أن المقاييس الفرعية والدرجات الكلية للبطارية لها درجة ثبات عالية على عينة الدراسة الحالية بحيث يمكن الاعتماد عليها (انظر: جدول 1).

شكل (1) نموذج بيدي وهينش للذاكرة العاملة



نموذج الذاكرة العاملة حسب نظرية بيدي وهينش، وتوضح مكونات الذاكرة العاملة المسؤولة عن الذاكرة قصيرة المدى، حيث تتكون من المنفذ المركزي الذي يقوم بوظيفة الإشراف على المعلومات القادمة من الذاكرة الحسية، فيقوم بترميزها وإرسالها إلى الذاكرة طويلة المدى، ومن ثم استعادتها وقت الحاجة، وتتم عملية الترميز والاستدعاء حسب طبيعة المعلومة إما لفظية أو بصرية-مكانية. (الأنصاري، سليمان، 2013)

جدول (1) معاملات الثبات بطريقة الانساق الداخلي لمهام الذاكرة العاملة اللفظية والبصرية-المكانية

مهام الذاكرة العاملة	مهام الذاكرة العاملة	
	الاستدعاء اللفظية	الاستدعاء البصرية-المكانية
الذاكرة العاملة اللفظية	0.83	0.83
الذاكرة العاملة البصرية-المكانية	0.83	0.83
الدرجة الكلية في الذاكرة العاملة اللفظية	0.83	0.83
الدرجة الكلية في الذاكرة العاملة البصرية-المكانية	0.83	0.83

3-الإجراءات:

تم الحصول على إذن خطي من جامعة الكويت، بالإضافة إلى الموافقات الرسمية من وزارة التربية، عندها قام الباحثان باختيار عينة عشوائية مستهدفة للتطبيق من الكور من أطفال مدارس المعهد الديني المتوسطة بنين ومن المدارس المتوسطة بنين من محافظتي الفروانية والعامصة. وكان التطبيق على أفراد العينة بصورة فردية وبمدة التطبيق حوالي نصف ساعة.

4-التحليل الإحصائي:

بواسطة برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS)، تم حساب الفروق بين الارتباطات لتقدير الثبات مهام الذاكرة العاملة اللفظية والبصرية-المكانية، كما حُسبت المتوسطات الحسابية، والاحترافات المعيارية، لأفراد كل مجموعة، وتم استخدام الاختبار التائي (T-test) لمعرفة الفروق بين متوسطات المجموعتين في ست مهام تقيس كل من الذاكرة العاملة اللفظية والبصرية-المكانية.

النتائج:

تم تطبيق اختبار (ت) للاستدلال على الفروق بين طلبة المعهد الديني وطلبة المرحلة المتوسطة بنين في الأداء على مهام الذاكرة العاملة والدرجة الكلية لكل مكون من مكونات الذاكرة العاملة، بالإضافة إلى المقاييس الفرعية لكل مكون. دل الاختبار على وجود فروق بين المتوسطات لصالح طلبة المعهد الديني للمرحلة المتوسطة في خمس مهام الذاكرة العاملة بالإضافة إلى الدرجتين كالتالي للذاكرة العاملة اللفظية والذاكرة العاملة البصرية-المكانية. أشارت النتائج المعروضة في جدول (2) الذي يوضح قيم (ت) في المهام الستة والدرجة الكلية على الذاكرة العاملة. فقد أشارت النتائج إلى وجود فروق دالة إحصائية في جميع مهام الذاكرة العاملة اللفظية والبصرية-المكانية ما عدا مهمة العد العكسي للأرقام وهي من ضمن مقاييس الذاكرة العاملة اللفظية، وبالتسوية لمقاييس الدرجة الكلية، فقد أظهر أن طلبة المعهد الديني في التعليم العام تفوقوا على طلبة المرحلة المتوسطة في كل من الدرجة الكلية على الذاكرة العاملة البصرية-المكانية والذاكرة العاملة اللفظية.

وهذه النتائج توضح تفوق طلبة المعهد الديني والذي قد يكون ناتج عن التدريبات على الحفظ في المنهج التي تعتمد على التلقين في مهام الذاكرة العاملة

جدول (2): المتوسطات الحسابية والاحترافات المعيارية واختبار (ت) للمقارنة بين متوسطات المجموعات (طلبة المعهد الديني وطلبة المدارس العامة للمرحلة المتوسطة) في مهام الذاكرة العاملة اللفظية والبصرية-المكانية، والمقاييس الفرعية لكل مكون.

مستوى الدلالة	قيمة ت	طلبة المرحلة المتوسطة للبنين (n=200)		طلبة المعهد الديني المتوسط للبنين (n=200) المعيارية		الذاكرة العاملة
		المتوسط	الاحتراف المعيارية	المتوسط	الاحتراف المعيارية	
**،.01	2.75	3.37	11.88	3.33	12.80	الاستدعاء اللفظي
**،.001	4.23	4.58	18.16	4.74	20.13	عد الأرقام
---	0.21	4.48	12.76	4.15	12.85	العد العكسي للأرقام
**،.01	2.40	4.00	15.75	3.73	16.68	الدرجة الكلية في الذاكرة العاملة اللفظية
**،.001	4.16	6.52	18.17	5.40	20.66	الشكل المختلف
**،.001	4.21	3.99	10.72	4.31	12.47	الأجور
**،.001	8.12	5.42	12.86	5.44	17.27	المدى المكاني
**،.001	6.99	4.41	13.95	4.16	16.95	الدرجة الكلية في الذاكرة العاملة البصرية-المكانية

التوصيات:

يقترح الباحثان إجراء المزيد من الدراسات على الذاكرة العاملة بأنواعها اللفظية، وبصرية-مكانية من الأعمار 11-17 سنة من فئات مختلفة مثل الجنس ومستوى التحصيل ونوع النظام التعليمي، بالإضافة إلى دراسة العلاقة بين الأداء على هذا المقاييس ودرجة التحصيل الدراسي لتلوقوف على مدى ملاءمة المناهج والنظام التعليمي مع فترة الطفولة.

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مصدر تمويل البحث: بحث غير ممول.



الهناء الشخصي: دراسة ارتباطية عاملية على عينة من طلبة جامعة الكويت

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الملخص:

يعتبر مفهوم الهناء الشخصي Subjective Well-Being أحد أهم المفاهيم في مجال علم النفس الإيجابي، حيث يُعرف بأنه تقدير الشخص وتقويمه لحياته الشخصية من الناحيتين المعرفية والوجدانية، بالتالي يمكن اعتباره مفهوماً شاملاً يتضمن خبرة الانفعالات السارة ومستوى منخفضاً من المزاج السلبي، ودرجة مرتفعة من الرضا عن الحياة. قام الباحثان باستخدام العديد من المقاييس الشخصية لقياس الوجدان الإيجابي والسلبي للمبحوثين، حيث تم تطبيق المقاييس على عينة من طلبة جامعة الكويت (ن=380). تم استخدام معاملات ارتباط بيرسون ومعامل ثبات ألفا كرونباخ، إضافة إلى التحليل العاملي الاستكشافي بهدف بحث العلاقة فيما بين المتغيرات الشخصية، والتحقق من البناء العاملي للهناء الشخصي. وجدت ارتباطات جوهرية موجبة بين كل من السعادة، والتفاؤل، والرضا عن الحياة، والأمل، في حيث كانت الارتباطات بين السعادة والاكتئاب والقلق جوهرية سالبة. أفضت نتائج التحليل العاملي الاستكشافي إلى استخلاص عاملين مستقلين، يشيران إلى أن مفهوم الهناء الشخصي مفهوم مركب عام ثنائي القطب يشمل الجانبين الإيجابي والسلبي.

أهداف الدراسة:

يهدف الباحثان من خلال الدراسة الراهنة إلى سد الفجوة في الدراسات التي تناولت مفهوم الهناء الشخصي، وحلته عملياً، على الصعيدين العربي والغربي، وذلك من خلال البحث في مكوناته، والعلاقة بين المتغيرات الشخصية المكونة لهذا المفهوم. أما عن فروض الدراسة فهي على النحو التالي:

1. وجود ارتباطات جوهرية موجبة بين السعادة، والرضا عن الحياة والأمل، والتفاؤل.
2. وجود ارتباطات جوهرية سالبة بين السعادة، والاكتئاب، والقلق.
3. استخلاص عاملين مستقلين للهناء الشخصي بحيث تتشعب على العامل الأول المتغيرات التي تقيس الجوانب الإيجابية في الشخصية كالسعادة، والرضا عن الحياة، والتفاؤل، والأمل، في حين تتشعب المتغيرات السلبية على العامل الثاني، كالقلق، والاكتئاب.

منهجية البحث:

أولاً: العينة: أجريت الدراسة على عينة قوامها 380 من طلبة جامعة الكويت، بواقع 180 ذكور، و200 إناث. متوسط أعمارهم 22.1 وإنحراف معياري 2.9

ثانياً: الأدوات: استخدم الباحثان العديد من المقاييس الشخصية ذات الخصائص السيكومترية الجيدة (انظر جدول 1). قامت الباحثة بتعريب اختبار أوكسفورد للسعادة OHQ، واستخدامه للمرة الأولى في دراسة عربية، إضافة إلى النسخ المعربة لكل من المقاييس التالية: اختبار التوجه نحو الحياة المعدل LOT-R، مقياس الرضا عن الحياة SWLS، مقياس الأمل للراشدين AHS، قائمة بيك للاكتئاب BDI-II، وقائمة بيك للقلق BAI.

جدول (1) معاملات ثبات ألفا للمقاييس

ألفا "كرونباخ"	
0.92	OHQ
0.70	LOT-R
0.80	SWLS
0.60	AHS
0.87	BDI-II
0.94	BAI

ثالثاً: الأساليب الإحصائية:

بإجراء التحليل الإحصائي للبيانات من خلال استخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية SPSS وذلك باستخدام الأساليب التالية:

1. معاملات ثبات ألفا "كرونباخ" للمقاييس المستخدمة.
2. معاملات ارتباط "بيرسون" لحساب العلاقة بين المتغيرات.
3. التحليل العاملي الاستكشافي للمتغيرات المكونة للهناء الشخصي.

النتائج:

في هذا الجزء سيقوم الباحثان بمناقشة نتائج الدراسة وفقاً لعرض الفروض.

نتائج الفرض الأول ونصه "وجود ارتباطات جوهرية موجبة بين السعادة، والرضا عن الحياة، والأمل، والتفاؤل". للتحقق من صحة هذا الفرض إحصائياً، تم استخدام معاملات ارتباط "بيرسون"، حيث خلصت النتيجة إلى تحقق الفرض (انظر جدول 2)، ووجود أعلى ارتباط جوهرية موجب بين السعادة والتفاؤل ($r=0.72$)، وأقل ارتباط جوهرية موجب بين الأمل والرضا عن الحياة ($r=0.54$).

جدول (2) مصفوفة معاملات الارتباط بين المتغيرات الشخصية الإيجابية في الدراسة

السعادة	التفاؤل	الرضا	الأمل
0.62	0.69	0.72	-
0.60	0.57	-	0.72
0.54	-	0.57	0.69
-	0.54	0.60	0.62

نتائج الفرض الثاني ونصه "وجود ارتباطات جوهرية سالبة بين السعادة، وكل من: الاكتئاب، والقلق". تم استخدام معاملات ارتباط "بيرسون" للتحقق من صحة الفرض، وأفضت النتيجة إلى تحقق الفرض (انظر جدول 3)، حيث كان أعلى ارتباط بين السعادة والاكتئاب ($r=-0.52$)، ثم ما بين السعادة والقلق ($r=-0.25$).

جدول (3) معاملات الارتباط بين السعادة والمتغيرات الشخصية السلبية في الدراسة

السعادة	
-0.52	الاكتئاب
-0.25	القلق

نتائج الفرض الثالث ونصه "استخلاص عاملين مستقلين للهناء الشخصي، بحيث تتشعب على العامل الأول المتغيرات التي تقيس الجوانب الإيجابية في الشخصية كالسعادة، والرضا عن الحياة، والتفاؤل، والأمل، في حين تتشعب المتغيرات السلبية على العامل الثاني، كالقلق، والاكتئاب". للتحقق من صحة هذا الفرض قام الباحثان باستخدام التحليل العاملي الاستكشافي للمتغيرات المكونة لمفهوم الهناء الشخصي، وذلك باعتماد خاصية التدوير المائل بطريقة "فارماكس" للمتغيرات الستة، حيث أن محك استخلاص العوامل هو بأن يكون (الجزء الكامن للعامل ≤ 1.0)، ومعياري (قيم التشعب ≤ 0.35). وبين جدول (4) تحقق الفرض من خلال استخلاص عاملين مستقلين؛ حيث تشعب على العامل الأول كل من: السعادة، والأمل، والتفاؤل، والرضا عن الحياة، في حين تشعب القلق، والاكتئاب على العامل الثاني، وبلغت نسبة التباين الكلي %73.03.

جدول (4) نتائج التحليل العاملي الاستكشافي

المتغيرات	العامل الأول	العامل الثاني
السعادة	0.86	-0.25
الامل	0.84	0.02
التفاؤل	0.80	-0.27
الرضا	0.79	-0.25
القلق	-0.03	0.91
الاكتئاب	-0.44	0.67
الجزء الكامن	3.37	1.01
تباين العامل	56.16	16.87
التباين الكلي	%73.03	

الخلاصة: استنتج الباحثان أن الهناء الشخصي عبارة عن عامل عام مركب، ثنائي القطب، حيث يحتوي على متغيرات شخصية إيجابية وأخرى سلبية.

التوصيات: 1. يقترح الباحثان إجراء المزيد من دراسات التحليل العاملي لمفهوم الهناء الشخصي على عينات مختلفة ومقارنة النتائج.

2. استخدام مقياس أوكسفورد للسعادة المعرب في المزيد من الدراسات العربية والتحقق من خصائصه السيكومترية.

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مصدر تمويل البحث: البحث غير ممول ومستقل من أطروحة ماجستير مقدمة لكلية الدراسات العليا بجامعة الكويت 2016

يوم المصنق العلمي للكلية الإنسانية والعلوم الاجتماعية للعام 2016/2015 بتاريخ 21 مارس 2016 قطاع الأبحاث



اسلوب الإستجابة المرغوبة إجتماعيا على مقاييس الشخصية: دراسة مقارنة على طلبة جامعة الكويت



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ت- الإجراءات:

وزعت مقاييس الدراسة في كراسة تحتوي على عدد (114) بنداً، وتعلق بعضها في جلسات جماعية من طلاب جامعة الكويت المقيدين بمقرر مدخل في علم النفس للفصل الدراسي الصيفي من العام 2014/2015 والفصل الدراسي الأول من العام 2015/2016، يضم كل منها عدداً متوسطاً من الطلبة بواقع (60) طالباً وطالبة تقريباً في كل جلسة وفي فترات الدراسة وذلك بالتنسيق مع المحاضر، علماً بأن وقت التطبيق لا يتجاوز 40 دقيقة كحد أقصى.

أ- التحليل الإحصائي:

تم تحليل البيانات كماً بواسطة برنامج الحزمة الإحصائية للعلوم الإجتماعية وبواسطة الأساليب الإحصائية التالية:

1- معاملات الارتباط لتقدير الثبات لمعوقات الدراسة (المرغوبة الإجتماعية، والإنجاز، والتدين، والالتزام، والقلق، والاضطراب الكروي للتلميذ).
2- اختبار التفاضل لتقدير الفروق بين متوسطات المجموعات (المجموعة الأقل مرغوبة إجتماعياً - المجموعة الأكثر مرغوبة إجتماعياً) في مقاييس الشخصية.

النتائج: تتعرف على طبيعة العلاقة بين أساليب الاستجابة المرغوبة اجتماعياً وبعض معوقات الشخصية (الإنجاز، والتدين، والقلق، والاضطراب الكروي للتلميذ)، تم تقسيم أفراد العينة إلى مجموعتين المجموعة الأقل مرغوبة إجتماعياً وقوامها (256) فرداً، والمجموعة الأكثر مرغوبة إجتماعياً وقوامها (212) فرداً، تبعاً للدرجة على مقياس الكذب EPQ-R، ومن ثم حساب الفروق بين متوسطات المجموعتين في مقاييس الشخصية باستخدام الاختبار التفاضلي كما هو موضح في الجدول رقم (2).

جدول (1): المتوسطات الحسابية والانحرافات المعيارية واختبار (ت) للمقارنة بين متوسطات المجموعات (المجموعة الأقل مرغوبة إجتماعياً - المجموعة الأكثر مرغوبة إجتماعياً) في مقاييس الشخصية.

مقياس الشخصية	المجموعة الأقل مرغوبة إجتماعياً (256 ن)		المجموعة الأكثر مرغوبة إجتماعياً (212 ن)		قيمة ت	مستوى الدلالة	مرجع أينما
	المتوسط	الانحراف المعياري	المتوسط	الانحراف المعياري			
الكلب EPQ-R-L	6.22	1.57	14.10	1.51	59.97	0.001	0.40
التدين	36.30	8.83	44.43	8.74	96.50	0.001	0.08
الإنجاز BFI-C	29.79	5.16	32.48	5.10	50.14	0.001	0.33
الإنجاز IPIP-C	31.38	4.45	34.35	5.10	66.14	0.001	0.58
الالتزام BDI-II	13.03	8.14	11.65	7.24	2.43	0.12	0.08
القلق BAI	23.30	14.49	19.89	13.26	27.77	0.001	0.13
الاضطراب الكروي للتلميذ PCL-5	19.68	14.44	14.84	14.70	30.52	0.001	0.16

يتضح من الجدول رقم (2) وجود فروق ذات دلالة إحصائية بين المجموعتين المجموعة الأقل مرغوبة إجتماعياً والمجموعة الأكثر مرغوبة إجتماعياً في مقاييس الشخصية حيث حصلت المجموعة الأكثر مرغوبة إجتماعياً على أعلى المتوسطات في كل من الكذب والتدين والإنجاز، وفي حين حصلت المجموعة الأقل مرغوبة إجتماعياً على أعلى المتوسطات في كل من الانسحاب والقلق والاضطراب الكروي للتلميذ، ومضى ذلك أن الاستجابة المرغوبة الأكثر مرغوبة إجتماعياً تتواءم مع مقاييس الشخصية تحت بطريقتين لا تعبر عن السمات الحقيقية لأفراد تلك المجموعة، بل تصدر في اتجاه الاستجابة التي يمكن وصفها بقرينة الأثر لهذه البؤرة، أو أنها الاستجابة على ضوء درجة الرغبة الإجتماعية للبلوغ كما يدرجها المبحوث، وينبع ذلك من الافتراض العام من أن الشخص يميل إلى أن يقدم لنا نفسه في صورة مفضلة مرغوبة اجتماعياً، ويحاول غالباً أن يترك للتسائراً طبعاً حسناً عنه. إذ أن الأخيرة لا تعبر عن السمة المعقدة، بل من الممكن أن تصادف إلى تباين الخطأ في مقاييس الشخصية، وكما يشير الجدول (2) على وجود عدم أثر لاختلاف حجم العينة في مقاييس الشخصية.

التوصيات:

تقترح دراسة هذا الموضوع من جوانب أخرى وفيما يلي بعض المقترحات لمواضيع مستقبلية لدراسة أثر اسلوب الاستجابة المرغوبة اجتماعياً على مقاييس الشخصية:

- دراسة الفروق بين الجنسين في الرغبة الإجتماعية.

- دراسة العوامل المؤكدة لأسلوب الاستجابة المرغوبة اجتماعياً.

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مصدر تمويل البحث: البحث ممول من قبل قطاع الأبحاث بجامعة الكويت مشروع رقم OP04/15 .

الملخص:

اسلوب الاستجابة المرغوبة اجتماعياً للبلوغ عبارة عن ميل إلى الإجابة عن بنود مقاييس الشخصية على أساس الرغبة الإجتماعية لهذه البؤرة، وهو حالة خاصة من التزيف إلى الأمام. تسعى هذه الدراسة للتحقق من تأثير أسلوب الاستجابة المرغوبة اجتماعياً على مقاييس الشخصية. هدفت الدراسة إلى التعرف على الفروق بين الطلبة والطالبات في اسلوب الاستجابة المرغوبة اجتماعياً على مقاييس الشخصية. تكونت عينة الدراسة من مجموعتين المجموعة الأقل مرغوبة إجتماعياً وقوامها (256) فرداً، والمجموعة الأكثر مرغوبة إجتماعياً وقوامها (212) فرداً. استخدمت في هذه الدراسة المقاييس التالية: مقياس الكذب المتفرج من استيفير "إيزنك" المعدل للشخصية EPQ-R، ومقياس الإنجاز المتفرج من قائمة العوامل الخمسة المتكبر BFI، ومقياس الإنجاز المتفرج من قائمة العوامل الخمسة للشخصية IPIP، وقائمة "بيك" للقلق BAI، وقائمة "بيك" للتعبية للكلب BDI-II، ومقياس التدين المتفرج من قائمة جامعة الكويت للتدين الإسلامي، وقائمة الاضطراب الكروي للتلميذ PCL. أسفرت نتائج الدراسة عن وجود فروق جوهرية بين المجموعتين في مقاييس الشخصية، حيث حصلت المجموعة الأكثر مرغوبة إجتماعياً على متوسطات أعلى في المقاييس التالية: الكذب، والتدين، والإنجاز، وفي حين حصلت المجموعة الأقل مرغوبة إجتماعياً على متوسطات أعلى في الكذب والقلق والاضطراب الكروي للتلميذ.

أهداف الدراسة: التعرف على طبيعة العلاقة بين أسلوب الاستجابة المرغوبة اجتماعياً وبعض معوقات الشخصية (الإنجاز، والتدين، والقلق، والاضطراب الكروي للتلميذ).

منهجية الدراسة:

أ- العينة: منهجية البحث:

العينة: تكونت عينة الدراسة الكلية من (760) فرداً من طلاب جامعة الكويت من طلاب جامعة الكويت المقيدين بمقرر مدخل في علم النفس؛ حيث كان متوسط أعمارهم يساوي 21.87 عاماً بخلاف معياره وقدره 3,30. تم تقسيمها إلى ثلاث مجموعات (الأقل- الوسط- الأكثر) تبعاً للدرجة على مقياس الكذب EPQ-R، وعليه تم استبعاد المجموعة المتوسطة في الدرجة على مقياس الكذب وقوامها (292) فرداً ومن ثم الاحتفاظ بمجموعتين المجموعة الأقل مرغوبة إجتماعياً وقوامها (256) فرداً، والمجموعة الأكثر مرغوبة إجتماعياً وقوامها (212) فرداً.

ب- الأدوات:

1. مقياس الكذب (21 بنداً) يبدل لإجابة المتفرج من استيفير إيزنك للشخصية المعدل - Re Eysenck Personality Questionnaire - Eysenck, Eysenck & Barrett, 1985 (Eysenck Personality Questionnaire - Revised (EPQ-R-L). لمزيد من المعلومات عن القائمة (انظر: الأنصاري 2014 -ص، ص: 385-424).
2. مقياس الإنجاز المتفرج من قائمة المتكبر الكلب (BFI Big Five Inventory) التي وضعها جون ودوناهو وكينيث (John, Donahue, and Kentle, 1991) كأداة لقياس سمة الإنجاز وتقييم فقرات الإنجاز (9 فقرات على أساس خمسة بدائل تتراوح بين (1) لا أوافق بشدة إلى (5) أوافق بشدة.
3. مقياس الإنجاز المتفرج من قائمة العوامل الخمسة (IPIP International Personality Item Pool) التي وضعها جون دوبرج (Goldberge, 1999). بواقع (10) عبارات لمقياس الإنجاز، يجب على الأفراد في ضوء مقياس خماسي التدرج (لا تنطبق على الإطلاق - تنطبق على قبلاً - تنطبق على أحياناً - تنطبق على كثيراً - تنطبق على تماماً) لمزيد من المعلومات عن المقياس (انظر: الأنصاري 2014 -ص، ص: 384-341).
4. مقياس التدين (12 بنداً) من اختبار (المتفرج من قائمة جامعة الكويت للتدين الإسلامي (لمزيد من المعلومات عن المقياس: انظر الأنصاري 2010).
5. قائمة "بيك" للتعبية للكلب BDI-II من إعداد (Beck, Steer, Brown, 1996) تعتبر قائمة "بيك" الثانية للكلب BDI-II وتتكون القائمة من (21) بنداً، وتتميز القائمة BDI-II بأنه قد تم بنؤها وتصميمها بغرض تقييم الأعراض المنتمية في محك تشخيص الاضطرابات الاكتئابية في الدليل الأمريكي التشخيصي والإحصائي الرابع للاضطرابات العقلية (لمزيد من المعلومات عن القائمة انظر: الأنصاري، 2014 -ص ص: 298-245).
6. قائمة "بيك" للقلق (BAI Beck Anxiety Inventory) من إعداد "بيك، إيسنك، براون-ستير" (Beck, Epstein, Brown & Steer, 1988) تقيس شدة القلق لدى المرضى في مجال الطب النفسي. تتألف القائمة بصورتها الأصلية من (21) بنداً تستخدم أسلوب التقرير الذاتي، ويصف كل بند عرضاً معروفاً من أعراض القلق، ويدلل الإجابة عبارة عن متصل من (4) نقاط تتراوح من صفر إلى (3)، حيث أن (صفر) يحصل (إطلاقاً)، (=1) (يشكل خفيفاً)، (=2) (يشكل معتدلاً)، (=3) (يشكل حاداً). لمزيد من المعلومات عن القائمة (انظر: الأنصاري 2014-، ص ص: 15-46).
7. قائمة الاضطراب الكروي للتلميذ (PCL-5 DSM-5 The PTSD Checklist for DSM-5) من إعداد (ويتزر، ليتز، كين، بلماري، ماركس، شور (Weathers, Litz, Keane, Palmieri, Marx, & Schnurr 2013) وتتألف القائمة بصورتها الأصلية من (20) بنداً وبدائل الإجابة عبارة عن متصل من (5) نقاط تتراوح من صفر إلى (4)، حيث أن لتقييم نطاق وتقرير المصروف هو 0-4 لكل بند هي: "لا على الإطلاق"، "قليلًا"، "أحيانًا"، "غالبًا"، "دائمًا". ويصف كل بند عرضاً معروفاً من أعراض الاضطراب الكروي للتلميذ ولغا للتلليل الأمريكي الخامس للاضطرابات العقلية DSM-5.

قام الباحثان بحساب ثبات المقاييس الداخلي لمقاييس الدراسة بطريقة معامل الفا "كرونيباخ" على عينة قوامها (760) فرد من طلبة جامعة الكويت بواقع (288) فرداً من الذكور و (472) فرداً من الإناث. جدول (1) يوضح قيم معاملات الثبات لمقاييس الدراسة على عينة من طلبة جامعة الكويت.

جدول (1) قيم معاملات الثبات لمقاييس الدراسة على عينة من طلبة جامعة الكويت

المقاييس	عدد البؤرة	قيمة الفا كرونيباخ
الكلب EPQ-R-L	11	0,70
الالتزام BDI-II	21	0,85
القلق BAI	21	0,94
الإنجاز BFI-C	9	0,73
الإنجاز IPIP-C	10	0,70
التدين	12	0,91
الاضطراب الكروي للتلميذ PCL-5	20	0,92

وتشير نتائج الجدول (1) إلى اتساق داخلي مقبول لجميع المقاييس. وبوجه عام يعد عامل الثبات الذي يساوي أو يزيد على 0.70 مقبولاً في مقاييس الشخصية.



نموذج العوامل الخمسة للشخصية: دراسة ثقافية مقارنة بين الكويتيين والمصريين

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النتائج: للتعرف على دور الثقافة (الكويت-مصر) ، و دور النوع (ذكور-إناث) ، وبيان طبيعة التفاعل بين الثقافة والنوع في نموذج العوامل الخمسة للشخصية. هذا تم استخدام تحليل التباين الثنائي. والجدول (2) بين خلاصة نتائج تحليل التباين الثنائي.

الجدول (2) نتائج تحليل التباين الثنائي لمعرفة أثر الثقافة والنوع والتفاعل بينهما في العوامل الخمسة

المتغير	مصدر التباين	مجموع المربعات	درجات الحرية	متوسط المربعات	قيمة ف	الدلالة الإحصائية
الصلابية	الثقافة (أ)	47236,27	1	47236,27	239,35	0,001
	النوع (ب)	9680,02	1	9680,02	49,05	0,001
	(أ) × (ب)	1494,28	1	1494,28	7,57	0,01
	الخطأ	771862,10	3911	197,36		
الانقباض	الثقافة (أ)	21969,47	1	21969,47	133,87	0,001
	النوع (ب)	1643,43	1	1643,43	10,01	0,02
	(أ) × (ب)	2701,74	1	2701,74	16,46	0,001
	الخطأ	641846,92	3911	164,11		
الانفتاح	الثقافة (أ)	120,99	1	120,99	1,37	غير دالة
	النوع (ب)	714,20	1	714,20	8,09	0,02
	(أ) × (ب)	256,10	1	256,10	2,90	غير دالة
	الخطأ	345349,43	3911	88,30		
القبول	الثقافة (أ)	30999,45	1	30999,45	171,35	0,001
	النوع (ب)	4324,32	1	4324,32	23,90	0,001
	(أ) × (ب)	2860,21	1	2860,21	15,81	0,001
	الخطأ	707560,42	3911	180,92		
الإقناع	الثقافة (أ)	1330,17	1	1330,17	4,69	0,05
	النوع (ب)	2327,43	1	2327,43	8,20	0,02
	(أ) × (ب)	217,23	1	217,23	0,77	غير دالة
	الخطأ	1109823,56	3911	283,77		

يمكن أن نستنتج من الجدول رقم (2) وجود تأثير جوهري للتفاعل بين الثقافة والنوع في الصلابة والانقباض والقبول، مما يعني أن تأثير الثقافة (كويتي-مصري) في مقايير الدراسة (الصلابة والانقباض والقبول) يختلف باختلاف النوع (ذكور- إناث)، كما أن تأثير النوع يختلف باختلاف الثقافة. في حين لم تكشف النتائج عن تأثير جوهري للتفاعل بين الثقافة والنوع في الانفتاح والإقناع ، مما يعني أن تأثير الثقافة (كويتي-مصري) في مقايير الدراسة (الانفتاح والإقناع) لا يختلف باختلاف النوع (ذكور- إناث)، كما أن تأثير النوع لا يختلف باختلاف الثقافة. يتضح من الجدول أن المصريين أكثر من الكويتيين في الصلابة والقبول والانقباض وبوجه عام. كما أظهرت النتائج أن الذكور المصريين أكثر صلابة وانقباضاً وانفتاحاً على الخبرات، وقبولاً من الذكور الكويتيين، فضلاً عن تفوق الإناث المصريات على الإناث الكويتيات في كل من الصلابة والانقباض والقبول والإقناع. كما حصلت الإناث على متوسطات أعلى من الذكور في الصلابة والانقباض والقبول، في حين حصل الذكور على متوسطات أعلى من الإناث في كل من والانقباض والإقناع. كما أظهرت النتائج أن الذكور الكويتيين والمصريين أقل صلابة من الإناث، كما أن الذكور الكويتيين أكثر انبساطاً واتقياً من الإناث الكويتيات، في حين أن الإناث الكويتيات أكثر انفتاحاً على الخبرات من الذكور الكويتيين. كما برهنت النتائج أن الإناث المصريات أكثر قبولاً من الذكور المصريين. وبناءً على نتائج هذه الدراسة فإن متغير الثقافة (كويتي-مصري) والنوع (ذكور- إناث)، لهما وزن كبير في التنبؤ كل من الصلابة والانقباض والقبول. أما عن أسباب هذه الفروق فليس من أهداف هذه الدراسة بحثها، وهي تحتاج إلى دراسة مستقلة.

التوصيات: يوصى الباحثان من خلال نتائج الدراسة الحالية بما يلي:

1. دراسة نموذج العوامل الخمسة للشخصية وفقاً لتصنيف السمات المكونة له.
2. الاهتمام بدراسة نموذج العوامل الخمسة للشخصية في جوانبه التطبيقية على عينات مختلفة مثل المرضى والفئات العمرية المختلفة.
3. استخدام التحليل العائلي التوكيدي للمقارنات عبر الثقافية وبين الجنسين في نموذج العوامل الخمسة للشخصية وباستخدام الصورة المظللة من قائمة العوامل الخمسة للشخصية.

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المخلص: هدفت الدراسة إلى التعرف على الفروق بين الكويتيين والمصريين، وبين الجنسين في العوامل الخمسة للشخصية، فضلاً عن التعرف على أثر تفاعل كل من النوع والثقافة في كل عمل من العوامل الخمسة. تكونت عينة الدراسة من مجموعتين الأولى (2109) من الكويتيين؛ بواقع (900) من الذكور، و (1209) من الإناث من طلاب جامعة الكويت، والثانية (1806) من المصريين؛ بواقع (888) من الذكور، و (918) من الإناث من طلاب جامعة طنطا. استخدمت في هذه الدراسة قائمة العوامل الخمسة الكبرى للشخصية (الصورة المظللة المعدلة) NEO-PI-R. أسفرت نتائج الدراسة عن وجود فروق جوهريّة بين الكويتيين والمصريين في أربعة عوامل للشخصية؛ حيث حصل المصريون على متوسطات أعلى من الكويتيين في العوامل التالية: الصلابة، والانقباض، والقبول، والإقناع. كما كشفت النتائج عن وجود فروق جوهريّة بين الجنسين لدى الكويتيين؛ حيث حصل الذكور على متوسطات أعلى من الإناث في كل من الانقباض، والإقناع، في حين حصلت الإناث على متوسطات أعلى من الذكور في الصلابة، والانفتاح. كما أظهرت نتائج الدراسة أيضاً عن وجود فروق جوهريّة بين الجنسين لدى المصريين؛ حيث حصلت الإناث على متوسط أعلى من الذكور في الصلابة، والقبول. وبرهنت النتائج عن وجود تفاعل بين كل من النوع (ذكور/إناث) والثقافة (كويتي/مصري) في كل من: الصلابة، والانقباض، والقبول.

أهداف الدراسة: التعرف على دور الثقافة (الكويت-مصر) ، و دور النوع (ذكور-إناث) ، وبيان طبيعة التفاعل بين الثقافة والنوع في نموذج العوامل الخمسة للشخصية.

منهجية الدراسة :

أ- العينة: اختيرت عينة عشوائية طبقية من مجموعتين الأولى (2109) من الكويتيين بواقع (900) من الذكور و (1209) من الإناث من طلاب جامعة الكويت المعقدين بمقرر مدخل في علم النفس؛ حيث كان متوسط أعمارهم يساوي 20.47. بالتحراف معياري وقدره 1,14، والثانية (1806) من المصريين بواقع (888) من الذكور و (918) من الإناث من طلاب كلية الآداب بجامعة طنطا المعقدين بمقرر مدخل في علم النفس، حيث كان متوسط أعمارهم يساوي 19.87. بالتحراف معياري 1,33. بلغت قيمة "ت" المحسوبة 15.19، وهي دالة عند مستوى 0.001. بين متوسط عمر العينة الكويتية والعينة المصرية، إلا أن هذه الفروق في العمر لا تؤثر في نتائج الدراسة نظراً لأن كلا المجموعتين تنتميان للفئة العمرية نفسها.

ب- أداة الدراسة: قائمة العوامل الخمسة للشخصية (الصورة المظللة المعدلة) NEO-PI-R

من تأليف كوستا، وماكري (1992) McCrae & Costa) وتعريب ماعري وآخرون (2005) McCrae, et al. وتتكون من 240 بنداً × 5 اختيارات واستقرت فترة التطبيق ما بين 60 إلى 70 دقيقة تقريباً، ويطلب من المفحوص الإجابة على كل مفردة باختبار الدرجة المناسبة له على متصل يمتد من 1 إلى 5. وذلك بصحيفة إجابة منفصلة، حيث تعني الدرجة (1) "معارض بشدة" الدرجة (2) "معارض" (3) "غير متأكد"، (4) "موافق" وأخيراً الدرجة (5) "غير متأكد" وتعني "موافق بشدة" على العبارة. تقيس قائمة العوامل الخمسة الكبرى للشخصية (الصورة المظللة المعدلة) خمسة عوامل للشخصية للراشدين الأسوياء الصلابة، والانقباض، والانفتاح، والقبول، والإقناع (المزيد من المعلومات عن القائمة انظر: الأنصاري 2014 ص: 538-521).

جدول (1): معاملات الثبات الخاصة بالمقايير المتفرعة عن قائمة العوامل

طرق حساب الثبات	الخمسية الكبرى للشخصية (الصورة المظللة المعدلة)				
	الصلابية NEO	الانقباض NEO	الانفتاح NEO	القبول NEO	الإقناع NEO
كرويت	.83	.84	.82	.78	.78
مصر	.84	.82	.78	.79	.78
معامل ألفا	.85	.84	.82	.81	.78

وتشير نتائج الجدول (1) إلى اتساق داخلي مرتفع لجميع المقايير المتفرعة من قائمة العوامل الخمسة، ويوجه عام يعد عامل الثبات الذي يساوي أو يزيد على 0.70 مقبولاً في مقايير الشخصية، وبالتالي فإن معاملات الثبات المستخرجة من المقايير المتفرعة من قائمة العوامل الخمسة تعتبر مقبولة لدى العينة الكويتية والمصرية لأنها تزيد عن 0.70.

ج- الإجراءات: وضعت بنود قائمة العوامل الخمسة للشخصية NEO-PI-R في استمارة واحدة، وتم تطبيقها تطبيقاً جمعياً، حيث ضمت كل جلسة تطبيق حوالي (35) طالباً وطالبة، وجرى التطبيق في فصول الدراسة، وفي وقت المحاضرة، وبعد الانتهاء من عملية التطبيق، جرى مراجعة الاستمارات المجمعة، واستبعدت التي كان بها نقص في الإجابة.

د- التحليل الإحصائي: بواسطة برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS)، خُصبت المتوسطات الحسابية، والاحترافات المعيارية، لأفراد كل مجموعة، وتم استخدام تحليل التباين الثنائي المتعدد لمعرفة أثر التفاعل بين النوع والثقافة في العوامل الخمسة للشخصية.



القلق لدى المراهقين: دراسة مقارنة

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النتائج

أولاً: نتائج الفرض الأول

الذي تصفه كالآتي: "توجد فروق جوهرية بين الطلاب والطالبات في القلق لصالح الطالبات". لتحقيق الهدف الأول للدراسة، وهو التعرف على الفروق بين الطلبة والطالبات في القلق تم استخراج قيمة (ت) للتحقق من دلالة الفروق بين متوسطات الذكور والإناث في القلق، و يوضح جدول (2) نتائج اختبار "ت" لدلالة الفروق بين متوسطات درجات المفحوصين تبعاً لمتغير الجنس (ذكور ن=300 / إناث ن=300) على قائمة "بيك" للقلق، ومن ملاحظة هذا الجدول يتبين أن قيمة "ت" جوهرية مما يشير إلى فروق جوهرية بين الطلاب والطالبات لصالح الطالبات في قائمة "بيك" للقلق، حيث بلغ متوسط الطالبات (18.666) وبلغ متوسط الطلاب (14.523) وأن متغير الدراسة (الجنس) على قائمة "بيك" للقلق قد وصل لمستوى الدلالة، ومن خلال هذه النتيجة يمكن الاستنتاج بأن النوع له أثر على القلق وأن درجة القلق عند الإناث أكثر شدة من درجة القلق لدى الذكور بوجه عام.

جدول (2) اختبار "ت" لدلالة الفروق بين متوسطات درجات المفحوصين تبعاً لمتغير الجنس (طلاب / طالبات) على قائمة "بيك" للقلق.

المتغير	نوع				المتغير الفرعي
	إناث (ن=300)		ذكور (ن=300)		
	ع	م	ع	م	
قائمة "بيك" للقلق	11.12	18.67	10.37	14.52	قيمة "بيك" للقلق
قيمة ت	4.720				مستوى الدلالة
	0.001				

ثانياً: نتائج الفرض الثاني

الذي تصفه كالآتي: "توجد فروق جوهرية بين الطلاب الكويتيين والبدون في" للقلق لصالح البدون. بين جدول (3) نتائج اختبار "ت" لدلالة الفروق بين متوسطات درجات المفحوصين تبعاً لمتغير الجنسية (كويتيين=300 / بدون ن=300) على قائمة "بيك" للقلق، ويتضح من قراءة هذا الجدول أنه توجد فروق جوهرية دالة عند مستوى 0.001 بين الكويتيين والبدون لصالح البدون في قائمة "بيك" للقلق وفقاً لمتغير الجنسية، حيث بلغ متوسط البدون (18.426) في حين حصل الكويتيين على متوسط (14.763).

جدول (3) اختبار "ت" لدلالة الفروق بين متوسطات درجات المفحوصين تبعاً لمتغير الجنسية (كويتيين / بدون) على قائمة "بيك" للقلق.

المتغير	جنس				المتغير الفرعي
	بدون (ن=300)		كويتيين (ن=300)		
	ع	م	ع	م	
قائمة "بيك" للقلق	11.72	18.43	9.78	14.76	قيمة "بيك" للقلق
قيمة ت	4.16				مستوى الدلالة
	0.001				

ثالثاً: نتائج الفرض الثالث

الذي تصفه كالآتي: "يوجد تفاعل بين كل من الجنس (الطلبة / الطالبات) والجنسية (كويتي/بدون) في القلق. وضح جدول (4) نتائج تحليل التباين الثنائي لمعرفة أثر الجنس (ذكور/ أنثى) والجنسية (كويتي/بدون) على قائمة "بيك" للقلق، وأسفرت نتائج هذا التحليل عن استخراج قيمة (ف) = 38.808 في التفاعل بين الجنس والجنسية وهي تعتبر قيمة دالة إحصائية، مما يشير إلى وجود أثر لتفاعل كل من الجنس والجنسية على متغير القلق.

جدول (4) نتائج تحليل التباين الثنائي لمعرفة أثر الجنس (ذكور/ أنثى) والجنسية (كويتي/بدون) على قائمة "بيك" للقلق.

مصدر التباين	مجموع المربعات	درجات الحرية	متوسط المربعات	قيمة ف المحسوبة	الدلالة الإحصائية
الجنس	2575.08	1	2575.08	24.36	0.001
الجنسية	2013.00	1	2013.00	19.04	0.001
التفاعل بين الجنس والجنسية	4102.9	1	4102.9	38.81	0.001
الخطأ	6311.57	596	38.81	-	-

التوصيات

إعادة إجراء الدراسة على عينات من طلاب المدارس الثانوية من جميع المناطق التعليمية بالكويت .

مصدر تمويل البحث

بعث غير ممول

الملخص

هدفت الدراسة الحالية إلى التعرف على الفروق في متغير القلق وفقاً للنوع والجنسية لدى عيّنتين " كويتية والبدون " من طلبة المرحلة الثانوية، وتكونت العينة من (600) طالبا وطالبة من طلاب وطالبات المرحلة الثانوية منهم (300) طالبا وطالبة من الكويتيين، و(300) طالبا وطالبة من فئة غير محددى الجنسية "البدون"، طبق عليهم قائمة "بيك" للقلق، أظهرت النتائج مايلي: توجد فروق جوهرية بين الذكور والإناث في قائمة "بيك" للقلق وفقاً لمتغير الجنس، كما أنه توجد فروق جوهرية بين الكويتيين والبدون في قائمة "بيك" للقلق وفقاً لمتغير الجنسية. بالإضافة إلى وجود أثر لتفاعل كل من الجنس والجنسية على متغير القلق.

الأهداف

تتمثل أهمية الدراسة الحالية في أهمية الموضوع الذي تصدى لدراسة، حيث إنها الدراسة الكويتية الأولى من نوعها استخدمت قائمة "بيك" للقلق لدى عينات من طلاب المدارس الثانوية من الكويتيين والبدون. أما عن فروق الدراسة فهي على النحو التالي:
1- توجد فروق جوهرية بين الطلبة والطالبات في القلق لصالح الطالبات.
2- توجد فروق جوهرية بين الطلاب الكويتيين والبدون في" للقلق لصالح البدون.
3- يوجد تفاعل بين كل من الجنس (الطلبة / الطالبات) والجنسية (كويتي/ بدون) في القلق.

منهجية البحث

أولاً: العينة

أجريت الدراسة على عينة قوامها (600) طالب وطالبة من الكويتيين والبدون، تتراوح أعمارهم بين (15-18) عاماً. ويوضح الجدول (1) توزيع أفراد العينة لمتغيرات الدراسة.

جدول (1) توزيع أفراد العينة وفقاً لمتغيرات الدراسة

المجموع	الصف الدراسي				المتغيرات	
	12	11	10	10	ذكور	كويتي
150	50	50	50	50	ذكور	غير كويتي
150	50	50	50	50	أنثى	كويتي
150	50	50	50	50	ذكور	غير كويتي
150	50	50	50	50	أنثى	غير كويتي
600	200	200	200	200	المجموع	

ثانياً: الأدوات

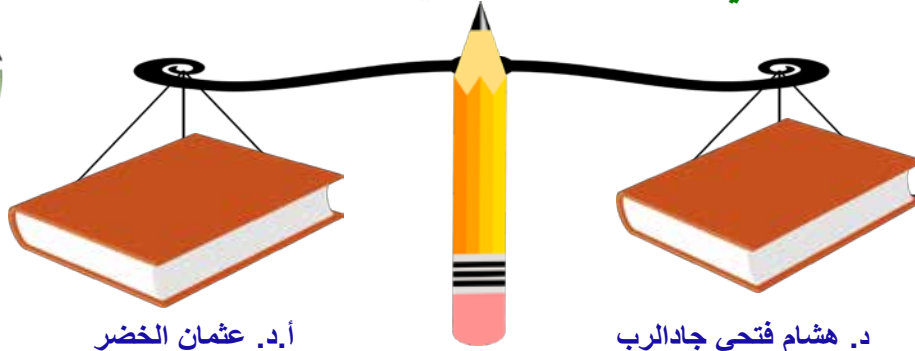
استخدمت الباحثان قائمة "بيك" للقلق (Beck Anxiety Inventory (BAI) وهي قائمة من إعداد Beck, Epstein, Brown & Steer, 1988 وتشتمل هذه القائمة (21) بنداً 4 × بدائل لإجابية، تقيس شدة القلق لدى المرضى في مجال الطب النفسي، ولهذا القائمة في صيغتها الإنجليزية اتساق داخلي مرتفع، فقد وصل معامل ثبات ألفا إلى (0.92)، وثبات إعادة التطبيق بعد أسبوع إلى (0.75)، والنصح أن القائمة تفرق مجموعات القلق التي تم تشخيصها عن المجموعات التي شخصت بغير القلق، ويفضل عن ذلك فقد اتضح أن قائمة "بيك" للقلق ترتبط ارتباطاً متوسطاً مع " مقياس هاملتون المعدل لتقدير القلق" (r=0.51) في حين ارتبطت القائمة "بقائمة هاملتون لتقدير الاكتئاب" ارتباطاً منخفضاً (r=0.25). كما تم حساب ثبات الاتساق الداخلي عن طريق حساب معاملات الارتباط بين كل بند والدرجة الكلية لقائمة "بيك" للقلق بعد استبعاد البند وتبين من خلال النتائج أن معاملات ارتباط بيرسون كانت مقبولة إلى حد ما في قائمة "بيك" للقلق. كما تم حساب صدق القائمة في دراسة "الأنصاري" (2014).

ثالثاً: الأساليب الإحصائية

تم استخدام أساليب إحصائية محددة للتحقق من الفروض باستخدام مجموعة البرامج الإحصائية للعلوم الاجتماعية SPSS. فقد تم إجراء التالي:

- 1- الاختبار التائي t-test لمعرفة الفروق في متغير القلق وفقاً للجنس.
- 2- الاختبار التائي t-test لمعرفة الفروق في متغير القلق وفقاً للجنسية.
- 3- تحليل التباين الثنائي Two way Anova لمعرفة أثر التفاعل بين الجنس والجنسية على القلق.

البناء العاملي والخصائص السيكومترية لمقياس العدالة الأكاديمية



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منهج الدراسة عينة الدراسة

شملت عينة الدراسة 232 طالب وطالبة من جامعة الكويت، وقد كان معظم أفراد العينة من الإناث (189) طالبة بنسبة 81.5% بمتوسط عمر 21.72 سنة وانحراف معياري 2.41 سنة.

أداة البحث

استخدمت الدراسة مقياس العدالة الأكاديمية من إعداد الباحثان الحاليان والذي تكون من 24 بنداً، تقيس أربعة أبعاد فرعية للعدالة الأكاديمية، هي: العدالة التوزيعية (أرقامها من 1-5)، العدالة الإجرائية (أرقامها من 1-12)، العدالة التفاعلية (أرقامها من 13-19)، والعدالة المعلوماتية (أرقامها من 20-24)، وتدل الدرجة المرتفعة على الميول إلى إدراك عال للفرد بالعدالة الأكاديمية، وهناك خمس استجابات محتملة، هي: غير موافق بشدة (1 درجة)، غير موافق (2 درجة)، لحد ما موافق (3 درجات)، موافق (4 درجات)، موافق بشدة (5 درجات)، وقد صيغت جميع البنود صياغة موجبة ولا توجد بنود عكسية.

الأساليب الإحصائية

تم استخدام التحليل العاملي التوكيدي للتحقق من البنية العاملية، ومعادلة براون البديلة لمعامل ألفا كرونياك للتحقق من الثبات.

نتائج الدراسة

مؤشرات ملائمة نموذج التحليل العاملي رباعي العوامل للبيانات			
مؤشر الملاءمة	CFI	TLI	RMSEA
قيمه	.917	.900	.067
الحكم على الملاءمة	ملائمة مقبولة	ملائمة مقبولة	ملائمة مقبولة

يتضح من الجدول ملاءمة النموذج الرباعي العوامل للبيانات بشكل مقبول. تم فحص مصفوفة البواقي المعيارية Standardized Residual Matrix للوصول لأسباب عدم تمام الملاءمة بين النموذج والبيانات.

كانت قيمة اتساق الداخلي المحسوبة بطريقة براون للعدالة الأكاديمية التوزيعية والإجرائية والتفاعلية والمعلوماتية على الترتيب هي 0.85 و 0.77 و 0.81 و 0.89. وهي معاملات اتساق داخلي مقبولة إلى مرتفعة لجميع الأبعاد الأربعة للعدالة الأكاديمية.

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أبعاد العدالة الأكاديمية

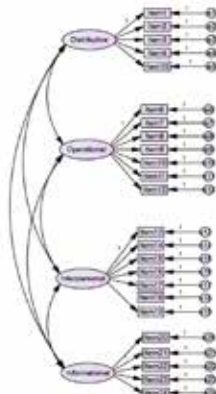
هناك اتجاه حديث يؤكد مصداقية البناء الرباعي من الناحية السيكومترية (Greenberg, 2011) والذي يرى بأن أبعاد العدالة التنظيمية هي: التوزيعية، والإجرائية، والتفاعلية، والمعلوماتية، حيث جاءت الدراسات اللاحقة مؤكدة لرصانة ومصداقية هذا البناء (Bell, Wiechmann & Ryan, 2006; Colquitt, Conlon, Wesson, Porter & Ng 2001; Judge & Colquitt, 2004; Streicher et al., 2007).

العدالة التوزيعية: ويقصد بها درجة إدراك الطالب لتوزيع المخرجات بشكل متكافئ بين الطلاب، بحيث يحصل الطالب على درجة في المقرر على أساس أدائه، ولا تدخل اعتبارات أخرى غير متعلقة بطبيعة المقرر مثل الخصائص الفردية للطلاب كالجنس والسن والعرق والدين والطائفة والانتماء السياسي وغيرها في حصوله على التقدير.

العدالة الإجرائية: ويقصد بها درجة إدراك الطالب للتكافؤ في الطرق والأليات والعمليات المستخدمة في تحديد المخرجات التي تسمه، وتتضمن أن يطبق أستاذ المقرر نفس الإجراءات على جميع الأفراد الذين يخصهم قرار معين (جميع الطلاب أو بعضهم)، دون إعطاء امتياز في الإجراءات لأي منهم دون الآخرين.

العدالة التفاعلية: ويقصد بها درجة إدراك الطالب لاحترام أستاذ المقرر لحقوقه الأكاديمية والإنسانية والتعامل معه بلطف ولباقة وصدق وأمانة، وعدم التمييز في المعاملة بين الطلاب. كما تشمل العدالة التفاعلية إدراك الطالب لوجود الطريقة التي يعامل بها الأستاذ الطالب عندما يتقدم بشكوى أو يطلب تفسير لإجراء من إجراءات المقرر.

العدالة المعلوماتية: ويقصد بها درجة إدراك الطالب لاحترام أستاذ المقرر لأسلته والإجابة عليها وعدم الاستهانة بها وتوضيح جميع الإجراءات المتعلقة بالمقرر للطلاب والتي منها الاختبارات وتوزيع الدرجات والتكليفات ونظام الغياب وتأثيره على الدرجات.



ملخص

يقدم باحثاً هذه الدراسة مفهوماً مستحدثاً للعدالة يتمثل في إدراك الطالب الجامعي للعدالة الأكاديمية، حيث شملت العينة 232 طالب وطالبة من جامعة الكويت (189) طالبة و 43 طالباً) بمتوسط عمري 21.7 سنة (ع=2.4). استخدم الباحثان مقياساً جديداً طور لهذا الغرض مكون من 24 بنداً، يفترض نظرياً أنها تقيس أربعة أبعاد للعدالة الأكاديمية. أظهرت نتائج التحليل العاملي التوكيدي لبيئته أن هناك أربعة أبعاد متميزة للعدالة الأكاديمية هي العدالة التوزيعية، والعدالة الإجرائية، والعدالة التفاعلية، والعدالة المعلوماتية، حيث كانت هذه الأبعاد على درجة كافية من ثبات الاتساق الداخلي.

مقدمة

العدالة مطلب إنساني منذ بدأ الخليقة، وحق أساسي من حقوق الإنسان بل من أرقى الحقوق الإنسانية، وإذا كانت العدالة مطلب مجتمعي فإنها لا تتحقق عملياً إلا بتحقيقها في كل مؤسسة من مؤسسات المجتمع. لذا ظهر مفهوم العدالة التنظيمية والذي يشير إلى إدراك الأفراد المنتمين للمؤسسة للعدالة في بيئة عملهم، ولكن قلما يلتفت أحد للعدالة كما يدركها الطلاب في مؤسساتهم التعليمية رغم أهميتها. أهتم التراث التربوي بمفهوم الحرية الأكاديمية في التعليم الجامعي وجرى تطويره ودراسته عبر زمن طويل، وقد اعتبروا مفهوم الحرية الأكاديمية مميزاً باعتباره المفهوم الذي يجعل الكليات الجامعية تختلف عن المؤسسات والمنظمات التجارية. ولكن مفهوم الحرية الأكاديمية يحمي حقوق الأستاذ الجامعي واستقلالته في حين لم تناقش البحوث التربوية العدالة الأكاديمية التي هي في الأساس موجبة نحو حقوق الطالب وهو أساس العملية التعليمية والمستفيد الأساسي منها.

أهداف البحث

تحاول هذه الدراسة تقديم مفهوم العدالة الأكاديمية Academic Justice إلى التراث التربوي من خلال مقارنته بمفهوم معروف في سياق علم النفس التنظيمي وهو مفهوم العدالة التنظيمية Organizational Justice، حيث يعتقد الباحثان أن مفهوم العدالة التنظيمية هو المفهوم الذي يشير للعدالة في بيئة العمل، وهو يقابل مفهوم العدالة الأكاديمية في سياق المؤسسات الأكاديمية.

تهدف الدراسة الحالية إلى إعداد مقياس للعدالة الأكاديمية في ضوء البناء رباعي العوامل للعدالة الأكاديمية (التوزيعية، الإجرائية، التفاعلية، المعلوماتية) بحيث يسهل على الباحثين وأساتذة الجامعات تقييم العدالة الأكاديمية من وجهة نظر طلابهم. والتحقق من صحة البناء العاملي الرباعي للعدالة الأكاديمية من وجهة نظر طالب الجامعة.



المصق العلمي العام الجامعي ٢٠١٥/٢٠١٦

عنوان البحث: العوامل المؤثرة في الحراك السياسي في المجتمع الكويتي خلال الفترة (٢٠٠٩-٢٠١٤): دراسة ميدانية

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مدرس في قسم العلوم السياسية - كلية العلوم الاجتماعية - جامعة الكويت

المخلص

تركز هذه الدراسة على دراسة ظاهرة الحراك السياسي، وتحاول الدراسة تحليل أهم العوامل المؤثرة في الحراك السياسي في المجتمع الكويتي، في خلال التركيز على دراسة حالة: الحراك السياسي في الكويت خلال الفترة من ٢٠٠٩ و٢٠١٤. وبشكل محدد، تهدف الدراسة إلى تحديد أهم العوامل المؤثرة في الحراك السياسي في الكويت ٢٠٠٩-٢٠١٤. وتتمثل هذه الدراسة على الإجابة كآداة لجميع البيانات المطلوبة، وقد وُضعت الاستبانة على عينة من أفراد المجتمع الكويتي الذين شاركوا في الحراك السياسي في الكويت ٢٠٠٩-٢٠١٤. وكذلك الأفراد الذين لم يشاركوا في هذا الحراك، في محاولة لتحديد أهم العوامل المؤثرة في المشاركة أو عدم المشاركة في الحراك السياسي المعاصر في الكويت ٢٠٠٩-٢٠١٤. كما تهدف الدراسة إلى تحليل تأثير المتغيرات الذاتية في المشاركة في هذا الحراك، وهي: العمر، والجنس، والمستوى التعليمي، وتوجهه أو الانتماء السياسي، والادارة الانتخابية. وتعرض الدراسة بأن هناك علاقات ذات دلالة إحصائية بين المشاركة في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، وثلاثة متغيرات رئيسية هي: الانتماء بالقيم الديمقراطية وفي الأساس حرية الرأي والتعبير، والثقة بالقرارات الذاتية، والثقة بأداء الحكومة.

المحور الأول المقدمة

أهداف الدراسة:

- ١- تحديد أهم العوامل المؤثرة في المشاركة في الحراك السياسي الأخرى في الكويت خلال الفترة ٢٠٠٩-٢٠١٤.
- ٢- تحديد العلاقة بين المتغيرات الديموغرافية لأفراد المجتمع الكويتي وهي (العمر، والجنس والمستوى التعليمي، وتوجهه أو الانتماء السياسي، والادارة الانتخابية) ومدى مشاركتهم في الحراك السياسي الأخرى في الكويت.
- ٣- تحديد العلاقة بين مدى ثقة الأفراد في قدراتهم الذاتية ومشاركتهم في الحراك السياسي الأخرى في الكويت.
- ٤- تحديد العلاقة بين مدى ثقة الأفراد بالقيم الديمقراطية المتطلعة بحرية الرأي والتعبير، ومشاركتهم في الحراك السياسي الأخرى في الكويت.
- ٥- تحديد العلاقة بين مدى ثقة الأفراد في أداء الحكومة وقدرتها على الإنجاز، ومشاركتهم في الحراك السياسي الأخرى في الكويت.

أسئلة الدراسة:

- ١- هل هناك فروق ذات دلالة إحصائية بين أفراد عينة المشاركين في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، وبعية أفراد غير المشاركين في هذا الحراك، تجاه متغير الانتماء بالقيم الديمقراطية المتطلعة بحرية الرأي والتعبير؟
- ٢- هل هناك فروق ذات دلالة إحصائية بين أفراد عينة المشاركين في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، وبعية أفراد غير المشاركين في هذا الحراك، تجاه متغير الثقة بالقرارات الذاتية للأفراد؟
- ٣- هل هناك فروق ذات دلالة إحصائية بين أفراد عينة المشاركين في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، وبعية أفراد غير المشاركين في هذا الحراك، تجاه متغير الثقة بأداء الحكومة وقدرتها على الإنجاز؟
- ٤- هل هناك علاقة ذات دلالة إحصائية بين المتغيرات الديموغرافية للمتعلقة بالجنس والعمر والمستوى التعليمي، وتوجهه أو الانتماء السياسي، والادارة الانتخابية من ناحية، والمشاركة في الحراك السياسي في الكويت في الفترة ٢٠٠٩-٢٠١٤ من ناحية أخرى؟
- ٥- هل هناك علاقة ذات دلالة إحصائية بين متغيرات الانتماء بالقيم الديمقراطية المتطلعة بحرية الرأي والتعبير، والثقة بالقرارات الذاتية للأفراد، والثقة بأداء الحكومة وقدرتها على الإنجاز، من ناحية، والمشاركة في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، من ناحية أخرى؟

المحور الثاني: إجراءات الدراسة:

منهج وأدوات الدراسة:

تعتمد الدراسة على المنهج الوصفي التحليلي في محاولة الوصول إلى النتائج الرئيسية للدراسة، وذلك من خلال الاعتماد على أداة الاستبانة وتوزيعها على عينة عشوائية من أفراد المجتمع الكويتي، وتتمثل هذه الدراسة على أدوات بحث متنوعة أهمها: الاستبانة، وصنادير بحث مثل الكتب والمجلات والدراسات العلمية ذات الصلة بوضوع البحث، والمعلومات الشخصية للدراسة بالمرتبطة بالحراك السياسي في الكويت.

عينة الدراسة:

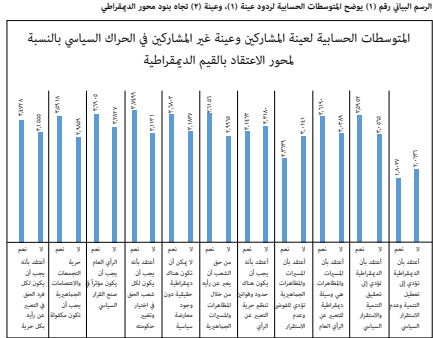
يشتمل مجتمع الدراسة على عينة من المواطنين من الذكور والإناث في دولة الكويت، وتتكون العينة من ٥٧٧ مشارك ومشاركة في الاستبانة، وقد اخذت العينة بطريقة عشوائية، وتم تقسيم مجتمع الدراسة إلى مجموعتين رئيسيتين، هما مجموعة المشاركين في الحراك السياسي في خلال الفترة ٢٠٠٩-٢٠١٤، والتي تم تقسيمها في هذه الدراسة ب (صينة رقم ١)، ومجموعة غير المشاركين في هذا الحراك، والتي تم تقسيمها (صينة رقم ٢). من حيث المنهج المتغيرات الديموغرافية للعينة الكلية هي: الجنس، والعمر، والمستوى التعليمي، واتجاهه أو الانتماء السياسي، والادارة الانتخابية، وتكونت أسئلة الدراسة من السؤال الرئيسي الذي يأسسه تم تقسيم أفراد العينة إلى مجموعتين رئيسيتين وهما: هل شاركت في الحراك السياسي الأخرى في الكويت خلال الفترة من ٢٠٠٩ و٢٠١٤؟

- كما اشتملت الاستبانة على الأسئلة الرئيسية المتعلقة بالمتغيرات الديموغرافية وهي:
- الجنس (ذكر، أنثى)
- الفئة العمرية (أقل من ١٨ من ١٨ إلى ٤٠ من ٤٠ إلى ٥٠ أكثر من ٥٠)
- المستوى التعليمي (دراسات عليا، جامعي، دبلوم، ثانوية، أخرى)
- توجهه أو الانتماء السياسي (إسلامي أو محافظ - مستقل - ليبرالي)
- الإدارة الانتخابية (الأولى، الثانية، الثالثة، الرابعة، الخامسة)

- وتكونت العينة من ثلاثة محاور رئيسية هي:
- محور الانتماء بالقيم الديمقراطية، وخصوصاً تلك المتعلقة بحرية الرأي والتعبير، وتشتمل هذا المحور على ١١ عبارة.
- محور ثقة الأفراد بقدرتهم الذاتية، وتشتمل على عبارتين.
- ومحور الثقة بأداء الحكومة وقدرتها على الإنجاز، وتشتمل على ٤ عبارات.
- وقد استخدمت الاستبانة مقياس ليكرت الخماسي في قياس استجابات المشاركين فيها، وهو مقياس يتكون من خمس درجات تتراوح: موافق بشدة (٥)، موافق (٤)، محايد (٣)، غير موافق (٢)، غير موافق بشدة (١).

المحور الثالث نتائج الدراسة

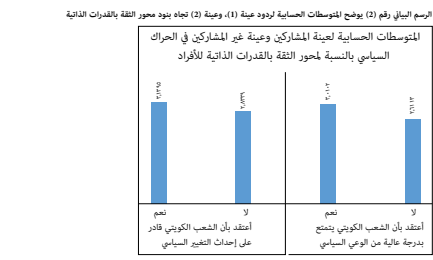
- ١- أن هناك فروق ذات دلالة إحصائية بين عينة المشاركين وبعية غير المشاركين في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، تجاه اعتمادهم بالقيم الديمقراطية.
- ٢- أن هناك علاقة ذات دلالة إحصائية بين متغير الانتماء بالقيم الديمقراطية من جهة، والمشاركة في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤ من جهة أخرى.
- حيث أوضحت النتيجة رقم ١ بأن هناك فروق ذات دلالة إحصائية بين أفراد المشاركين في الحراك من جانب والأفراد غير المشاركين في الحراك من جانب آخر تجاه اعتمادهم بالقيم الديمقراطية. بحيث إن الأفراد المشاركين في الحراك كانوا أكثر اعتماداً بالقيم الديمقراطية من غيرهم من أفراد غير المشاركين في هذا الحراك، وتعرضت هذه النتيجة بالنتيجة رقم ٣ التي أثبتت وجود علاقة ذات دلالة إحصائية بين متغير الانتماء بالقيم الديمقراطية من جانب والمشاركة في الحراك السياسي في الكويت من جانب آخر، بحيث أوضحت الدراسة بأن هناك علاقة ذات دلالة إحصائية بين الانتماء بالقيم الديمقراطية والمشاركة في الحراك السياسي، أي أنه كلما زاد اعتماد الأفراد بالقيم الديمقراطية، زادت فرص مشاركتهم في الحراك السياسي.



الرمح البياني رقم (١) يوضح المتوسطات الحسابية لردود عينة (١)، وبعية (٢) تجاه بند محور المتغيرات الديموغرافية

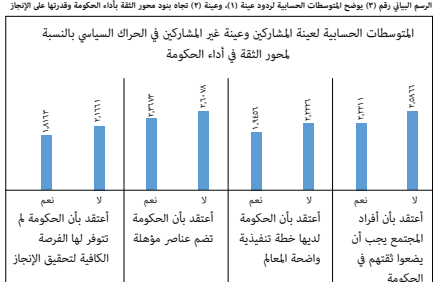
٢-٣ أن هناك فروق ذات دلالة إحصائية بين عينة المشاركين وبعية غير المشاركين في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، تجاه تقويم بقدراتهم الذاتية على العمل.

٢-٤ أن هناك علاقة ذات دلالة إحصائية بين متغير الثقة بالقرارات الذاتية للأفراد من جهة، والمشاركة في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤ من جهة أخرى. كما كشفت الدراسة من خلال النتيجة رقم ٣ عن وجود فروق ذات دلالة إحصائية بين أفراد المشاركين في الحراك السياسي من جانب، والأفراد غير المشاركين فيه من جانب آخر، تجاه تقويم بقدراتهم الذاتية، وخصوصاً قدراتهم على التعبير، بحيث إن الأفراد المشاركين في الحراك كانوا أكثر ثقة بقدراتهم الذاتية على التعبير من الأفراد غير المشاركين، وهي النتيجة التي تأكدت من خلال النتيجة رقم ٤، والتي أوضحت وجود علاقة ذات دلالة إحصائية بين متغير الثقة بالقرارات الذاتية للأفراد من جانب، والمشاركة في الحراك السياسي من جانب آخر، بحيث أوضحت الدراسة بأن هناك علاقة ذات دلالة إحصائية بين الثقة في القرارات الذاتية للأفراد والمشاركة في الحراك السياسي، أي أنه كلما زادت ثقة الأفراد في قدراتهم الذاتية على التعبير، زادت فرص مشاركتهم في الحراك السياسي.



- ٥- أن هناك فروق ذات دلالة إحصائية بين عينة المشاركين وبعية غير المشاركين في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤، تجاه تقويم أداء الحكومة وقدرتها على الإنجاز.
- ٦- أن هناك علاقة ذات دلالة إحصائية بين متغير الثقة بأداء الحكومة وقدرتها على الإنجاز من جهة، والمشاركة في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤ من جهة أخرى.

وأوضحت الدراسة من خلال النتيجة رقم ٥ بأن هناك فروق ذات دلالة إحصائية بين أفراد المشاركين في الحراك السياسي من جانب، والأفراد غير المشاركين في الحراك تجاه تقويم أداء الحكومة وقدرتها على الإنجاز، بحيث إن الأفراد المشاركين في الحراك كانوا أقل ثقة بأداء الحكومة من أفراد غير المشاركين في الحراك، وهي النتيجة التي تعززت من خلال النتيجة رقم ٦، والتي أثبتت وجود علاقة ذات دلالة إحصائية بين متغير الثقة بأداء الحكومة وقدرتها على الإنجاز من جانب، والمشاركة في الحراك السياسي من جانب آخر، بحيث وجدت هذه الدراسة أن هناك علاقة ذات دلالة إحصائية بين الثقة في أداء الحكومة، والمشاركة في الحراك السياسي، أي أنه كلما قلت ثقة الأفراد في أداء الحكومة وقدرتها على الإنجاز، زادت فرص مشاركتهم في الحراك السياسي.



الرمح البياني رقم (٢) يوضح المتوسطات الحسابية لردود عينة (١)، وبعية (٢) تجاه بند محور الثقة بالقيم الديمقراطية وقدرتها على الإنجاز

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- ٧- أن هناك علاقة ذات دلالة إحصائية بين متغيرات الجنس، والعمر، والمستوى التعليمي من جهة، والمشاركة في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤ من جهة أخرى.
- ٨- أنه لا توجد هناك علاقة ذات دلالة إحصائية بين متغيرات الانتماء السياسي، وميل الناظر الانتخابية من جهة، والمشاركة في الحراك السياسي في الكويت خلال الفترة ٢٠٠٩-٢٠١٤ من جهة أخرى.

جدول اخبار كمي لقياس العلاقة ما بين المتغيرات الديموغرافية ومتغير المشاركة في الحراك السياسي

المتغير الديموغرافي	متغير المشاركة في الحراك السياسي	الجنس
درجة الحرية مستوى الدلالة	Chi-square ٥٥,٦١٤ ١ ٠٠٠٠	
العمر	Chi-square ٣٩,٧٦٥ ٤ ٠٠٠٠	
المستوى التعليمي	Chi-square ٩,٩٥٩ ٤ b,c,*٠٤١.	
الانتماء السياسي	Chi-square ١,٣٨٢ ٣ ٥٠١.	
الدائرة الانتخابية	Chi-square ٥,٥٥٥ ٤ ٣٣٥.	

جدول يوضح التوزيع التكراري لقيمة رقم ١، وبعية رقم ٢

المتغير الديموغرافي	المشاركة في الحراك السياسي		الجنس
	لا نعم	نعم	
الفترة العمرية	أقل من ١٨ ما بين ١٨ و ٣٠ ما بين ٣١ و ٤٠ ما بين ٤١ و ٥٠ أكثر من ٥٠ سنة	٢٧, ٢٥٤,٨ ٣١٠,٠ ٣٨,٢ ٣٥,٤	٣٢٧ ١٦٦ ٩١ ٢٤ ١٦
المستوى التعليمي	دراسات عليا جامعي دبلوم ثانوية أخرى	٤٩ ٢٠١ ٢٧ ١٧ -	٢٥ ٢١٦,٧ ٢١٩ ٢٨٤,٤ ٢٥ ٣٩,٢ ١٣ ٣٥,٨ ١ ٣٤,٠
الانتماء السياسي	إسلامي مستقل ليبرالي	١٣٢ ١٥٨ ١٤	١٠٥ ٣٤١,٥ ١٦٦ ٣٥٣,٧ ١٧ ٣٤,٨
الدائرة الانتخابية	الأولى الثانية الثالثة الرابعة الخامسة	١٥ ٣٠ ٥١ ١٣٣ ٧٥	١٧ ٣٥,١ ٣١ ٢١٠,٢ ٦٥ ٢١٧,٣ ١١٧ ٣٤١,٨ ٥٣ ٢٦٥,٥

Religion, Electoral Rules, and Women's Representation: A Cross National Examination



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Abstract

This paper examines cultural and institutional variables that affect the percentages of women's representation in national parliaments in 64 countries worldwide. Religion and sub-religious groups as cultural variable show that variation of women's representation could be explained accordingly. Also, quota rule law, electoral system, and type of government explain the variation of women's representation in parliaments. Those results confirm that both cultural and institutional factors matter in explaining women's representation.

Question

While there is an increase interest in gender and women studies there are too many controversies and gaps in explaining why women is under represented in the national parliaments and if represented what explain the variation in the percentages among national parliaments. Our endeavor in this paper is to present multiple explanatory variables that would speak to the representation of women in parliament in both its deficit and its variation in 64 countries worldwide.

Data and Method

Data:

- This research includes 64 countries worldwide divided as follow:
- 21 Arab countries.
- 21 quota rule countries.
- 21 non-quota rule countries.

Selection and justification:

- We include Arab countries due to our interest and speciality.
- Saudi Arabia was excluded because women is not granted women suffrage law.
- The quota and non-quota rule countries are randomly sampled using Saint Joseph College website for random sampling: www.sjc.edu.
- Australia is included in the data to have a comprehensive study of all regions.
- Elections years are included from 1990-2010.

Method:

- National examination across time.
- Linear regression was used because the data are categorical.
- Random effect model for countries was also used.
- We are using a 0.10 alpha-level for statistical test in the figures

Dependent variable:

- Women's representation in national parliaments.

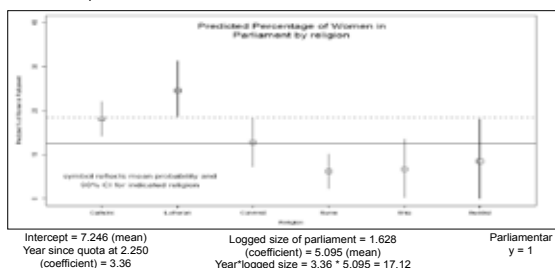
Independent variables:

- Dominant religion: Islam, Christianity, Buddhist, Agnostics.
- Dominant sub-religious group: Sunni, Shi'a, Catholic, Lutheran Protestant, Calvinist Protestant.
- Quota rule system: legislative quota, party quota, sanctions for non-compliance.
- Electoral systems: proportional representation (PR), plurality/majority, mixed, and other.

Results

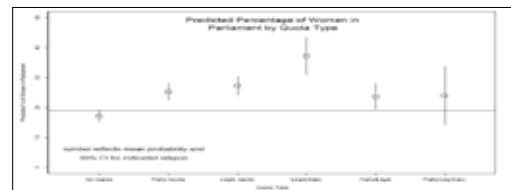
1. Religion and sub-religious:

- Christian countries have higher percentages of women representation than Islamic and Buddhist countries significantly.
- Lutheran Protestant countries have higher gender representation than do Calvinist Protestant countries. But, there is no significant difference between the gender representation of Lutheran Protestant countries and Catholic countries.
- No significant different between Shi'a and Sunni countries in the Islamic world as anticipated.



2. Quota, quota type and sanctions:

- Countries that adopt the quota system has higher and significant results than non-quota countries for women's representation.
- Countries that apply sanctions for non-compliance also show higher and significant results for women's representation than absence of sanctions.
- Legislative quota countries tend to have a positive effect on women's representation.
- Party quotas also have a positive effect on women's representation, but less than legislative quotas.
- In quota rule countries, as the size of parliament increases and the longer quotas are in place, the percentage of women in parliament declines. This suggests that women are more isolated in larger sized parliaments and more integrated in smaller sized parliaments.



Conclusion

This paper shows that there is a relationship between religions in general and sub-religious groups and women representation in national parliaments in particular. It also shows that quota system has a role in explaining the dependent variable. Although most of the variables proven to be significant when tested individually, yet we conclude that testing their significance through a model within variable interaction and accounting for case randomness is more profound. Hence, the presented model shows that sub-religious groups and quota system are the most explanatory variables that account for variation among women's representation and that was shown through the random effect model results which was significant for both variables. Most importantly are the findings of the Lutheran Protestant over the Calvinist in explaining women's representation. Plus, that in quota rule countries, as the size of parliament increases and the longer quotas are in place, the percentage of women in parliament declines. This paper results confirm that both political culture through religious factors and political structure through institutional factors like the quota rule matter in explaining gender studies in general and women's representation in national parliaments in particular. Last but not least, this research program needs more effort and further research in the field; it needs more countries and more elections to further confirm or add to the results shown.

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العلوم الاجتماعية



عنوان البحث : أثر كل من المخالفة والاختلاف في عقد الوكالة في الفقه الإسلامي - دراسة فقهية مقارنة

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أهم النتائج :

- 1- الأصل في الوكالة المطلقة أن يراعى الإطلاق ما لم يخالف الشرع أو العرف.
- 2- يجوز للوكيل وكالة مطلقة أن يشتري ويبيع بثمن المثل ويغيب يسير.
- 3- إذا اشترى الوكيل وكالة مطلقة أو باع بغبن فاحش فالموكل بالخيار بين الإمضاء أو الفسخ.
- 4- إذا اشترى الوكيل وكالة مطلقة سلعة معينة وهو لا يعلم بالعيب وقت العقد فالشراء صحيح ويقع للموكل.
- 5- إذا اشترى الوكيل وكالة مطلقة سلعة معينة وهو يعلم بالعيب وقت العقد فيلزم البيع الموكل إذا كان العيب يسيراً وفيه مصلحة له، ولا يلزمه إذا كان العيب كثيراً إلا إذا رضي به.
- 6- لا يجوز للوكيل وكالة مطلقة بالبيع أن يبيع المتاع بثمن مؤجل.
- 7- إذا اشترى الوكيل بأكثر من الثمن الذي قدر له فيخبر الموكل بين الإمضاء والفسخ.
- 8- ليس للوكيل أن يخالف الموكل إذا عين له شخصاً أو مكاناً أو زماناً.
- 9- إذا اختلف الموكل والوكيل في أصل الوكالة، فيؤخذ بقول من تؤيده البينة، وإلا فالقول للموكل.
- 10- إذا اختلف الموكل والوكيل في صفة الوكالة فيؤخذ قول من تؤيده البينة، وإلا فالقول قول الموكل.
- 11- إذا اختلف الموكل والوكيل في تعدي الوكيل أو تفريطه في الحفظ فالقول لمن تؤيده البينة، وإلا فالقول قول الموكل يمينه.
- 12- إذا وقع الاختلاف بين الموكل والوكيل في التلف فيؤخذ بقول من تؤيده البينة وإلا فالقول قول الوكيل يمينه.
- 13- إذا اختلفا الموكل والوكيل في الرد فيؤخذ بقول الوكيل يمينه.

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ملخص البحث :

الوكالة من محاسن الإسلام، حيث أجاز للإنسان توكيل غيره ليقوم نيابة عنه بتحقيق مصالحه وتلبية حاجاته، وفي كثير من الأحيان تحقق الوكالة المقصود من شرعيتها، وهو تحقيق مصلحة الموكل على الوجه الذي يريده ويرتضيه، وفي بعض الأحيان لا يتحقق ذلك المقصود؛ إما بسبب مخالفة الوكيل لتوجيهات موكله، وإما لظن الموكل أن الوكيل قد خالفه، والوكيل ينكر ذلك، وهنا يأتي الفقه الإسلامي . ممثلاً في مذاهبه المعتمدة . ليقدّم الأحكام العملية التي تحسم الخلاف، وترفع النزاع، مبينة الآثار الفقهية لمخالفة الوكيل لموكله، وموضحة من يأخذ بقوله عند اختلاف قول كل من الموكل والوكيل وإدعاء كل منهما خلاف ما يدعيه الآخر.

أهداف البحث :

يهدف هذا البحث الموجز إلى تقديم خلاصة تلك المسائل التي ذكرت في مصادر الفقه الإسلامي المذهبية والمقارنة، ويقربها للراغبين في معرفتها والإطلاع عليها، لا سيما مع كثرة وقوعها، وكثرة التقاضي فيها، مما يؤكد سعة الفقه الإسلامي ومرونته لاستيعاب أسئلة الناس، وما يستجد لهم من نوازل كما قال تعالى: { ما فرطنا في الكتاب من شيء } .

خطة البحث :

قسمت البحث إلى تمهيد وفصلين وخاتمة:
المقدمة : ذكرت فيها أهمية الموضوع، وسبب اختياره، وخطة البحث ومنهج البحث.
والتمهيد: في تعريف الوكالة، وبيان مشروعيتها، وأركانها وشروطها.
الفصل الأول: أثر مخالفة الوكيل للموكل.
الفصل الثاني: أثر الاختلاف بين الموكل والوكيل.
الخاتمة: وفيها أهم نتائج البحث.

منهجية البحث :

سلكت في هذا البحث الموجز المنهج الاستقرائي والمنهج الاستنباطي والمنهج المقارن، من خلال تتبع مذاهب الفقهاء وبيان ما قرروه من أحكام المخالفة والاختلاف بين الموكل والوكيل، ثم استنباط الحكم الراجح من مذاهبهم بعد عرض أدلتهم ومناقشتها، وتلخيص ملامح منهج البحث في الآتي:
أولاً : بيان مواضع الآيات التي ورد ذكرها في ثنايا البحث بذكر اسم السورة ورقم الآية في الهامش .
ثانياً : تحريج الأحاديث النبوية الواردة في البحث من كتب السنة المعتمدة .
ثالثاً : الرجوع إلى المصادر الأصلية والمراجع المعتمدة عند بيان موقف الفقه الإسلامي ، مع ذكر مذاهب الفقهاء وأدلتهم والمناقشة والترجيح ، مع توثيق ذلك بالهامش .
رابعاً : ختمت البحث بذكر قائمة المصادر والمراجع وفهرس المحتويات .

96950225



عنوان البحث : المزاد الخيري .. حكمه وضوابطه الشرعية

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كلية الشريعة والدراسات الإسلامية

ملخص البحث :

يتحدث البحث عن انتشار المزايدات الخيرية التي تقوم بها الجهات الخيرية في الوقت الحاضر والضوابط والأحكام الفقهية المتعلقة به، حيث تم تعريف المزاد الخيري وأهدافه ثم تكلم البحث عن التكليف الفقهي للمزاد الخيري وحكمه الشرعي وفي نهاية البحث وضع البحث ضوابط فقهية عامة للمزايدات الخيرية بالإضافة إلى الخاتمة والتناجيج والتوصيات والفهارس.

مشكلة البحث :

تكمن مشكلة هذا البحث في زيادة عقد المزايدات الخيرية في الآونة الأخيرة، بهدف دعم مؤسسات وجهات العمل الخيري، فتعقد هذه المزايدات لتحصيل أكثر قدر من التبرعات لصالح مثل هذه المؤسسات، ومن هنا تصبح الحاجة ماسة إلى معرفة الأحكام والضوابط الفقهية لمثل هذه المزايدات، خاصة أنها تتضمن في طياتها بعض الإشكالات الفقهية التي تستوجب الوقوف عندها قبل الإقدام على عقدها وتنظيمها، مثل التكليف الفقهي لهذا العقد.

أسباب اختيار الموضوع :

- 1- مما هو مشاهد الآن العمل بالمزاد الخيري من قبل مؤسسات العمل الخيري الإسلامية، وزيادة الإقبال عليه من قبل الناشطين في العمل التطوعي والخيري، وما استتبعه ذلك من كثرة الأسئلة والفتاوى حول المزايدات الخيرية، فكل هذا يستوجب بحث هذا النوع من المزايدات، لبيان حكمه الفقهي.
- 2- كما أن الحاجة تمس إلى معرفة الضوابط الفقهية التي ينبغي أن تراعى أثناء عقد هذه المزايدات.
- 3- رغبي في إبراز مرونة الفقه الإسلامي، وراثته الكمي والكيفي، وقدرته على تناول كافة القضايا المستجدة، وطرح الحلول لها.
- 4- لم يتناول أحد من الباحثين هذا الموضوع من قبل بحث مستقل.

أهداف البحث :

- 1- الوقوف على التكليف الفقهي لتنظيم عقد المزاد الخيري.
- 2- الوقوف على الحكم الفقهي لتنظيم عقد المزاد الخيري.
- 3- بيان الضوابط الفقهية لتنظيم عقد المزاد الخيري.

منهجية البحث :

- اعتمد الباحث أكثر من منهج علمي في هذا البحث، حيث كان المنهج الاستقرائي لجمع المادة العلمية للبحث من أمهات الكتب الفقهية القديمة والمعاصرة، ثم المنهج التحليلي؛ لتحليل المادة العلمية موضوع البحث، ثم المنهج المقارن، للمقارنة بين مذاهب الفقهاء في المسائل الخلافية التي يتعرض لها البحث. وإلى جانب ذلك، فقد سرت في كتابة هذا البحث وفق الخطوات التالية:
- 1- جمع مادة البحث من المصادر الأصلية في الفقه الإسلامي القديمة والمعاصرة.
 - 2- التعريف بمصطلحات البحث قبل الدخول إلى التعرف على رأي الفقه الإسلامي في المسألة موضوع البحث.
 - 3- توثيق الأقوال من مصادرها، وعدم اللجوء إلى النقل بالوساطة إلا عند عدم وجود الأصل.
 - 4- عرض أقوال الفقهاء في المسألة، وذكر الأدلة، ووجه الاستدلال، مع المناقشة والترجيح.
 - 5- بيان القول الراجح في المسائل الخلافية بعد الموازنة بين الأدلة.
 - 7- التركيز على المسائل المتعلقة بالبحث، وعدم الخروج عن موضوعه.
 - 8- عزو الآيات القرآنية إلى مواضعها في المصحف الشريف، بذكر السورة ورقم الآية.
 - 9- ترجيح الأحاديث والآثار الواردة من كتب السنة المعتمدة.

أهمية الموضوع :

- تكمن أهمية الموضوع في النقاط التالية:
- 1- إنه يتناول بالدراسة الفقهية واحدة من الوسائل المستحدثة لمصادر العمل الخيري، وهو المزاد الخيري.
 - 2- إنه يكشف عن الضوابط الفقهية التي ينبغي مراعاتها في عقد المزاد الخيري حتى يكون موافقاً للشرعية الإسلامية، غير متصادم مع أي من مبادئها.
 - 3- يعد هذا الموضوع إضافة متواضعة إلى مكتبة الدراسات الفقهية المعاصرة التي تعنى بدراسة المسائل المستجدة التي تنزل بالمسلمين يوماً بعد يوم بسبب التطور السريع في كل مناحي الحياة من حولنا.

أهم النتائج :

- 1- التعريف المختار لبيع المزايدة هو أنه: "بيع لمن يزيد، تستحق السلعة فيه لمن يبدل فيها أكثر من الباقين".
- 2- المزاد الخيري نوع من أنواع البيع بالمزايدة، ولا يخرج في حقيقته وتكليفه الفقهي عن بيع المزايدة.
- 3- رجحان ما ذهب إليه جمهور الفقهاء من أن بيع المزايدة بيع من البيوع الجائزة.
- 4- هناك بعض الضوابط الشرعية التي ينبغي الالتزام بها من قبل منظمي المزايدات الخيرية، وهي: الضابط الأول: ألا تكون قيمة السلع مرتفعة بسبب اتساعها إلى أصحاب المهن المحرمة. الضابط الثاني: أن تكون الجهة التي يعقد المزاد لصالحها مما يجوز التبرع لها. الضابط الثالث: أن يكون قصد المشتري هو التقرب إلى الله بالتبرع للجهات أو الأشخاص المحتاجين. الضابط الرابع: عدم البهجة والإسراف في إقامة المزاد الخيري من جانب منظميه. الضابط الخامس: ألا يرجع المتبرع بالسلعة فيكون أحد المسالمين في ثمنها.

التوصيات البحث :

- 1- أوصي هيئات العمل الخيري الإسلامي بتنوع مصادر تمويلها، من خلال ابتكار طرق وأساليب جديدة لحث المومنين على التبرع للضعفاء والمحتاجين.
- 2- أوصي القائمين على عقد المزايدات الخيرية بضرورة مراعاة الضوابط الشرعية لعقد المزاد الخيري، والتي عرضنا لها في هذا البحث.

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- 4- أحكام القرآن. تأليف: القاضي محمد بن عبد الله أبو بكر بن العربي المعافري الأشبيلي المالكي (المتوفى: 543هـ). تحقيق: محمد عبد القادر عطا. دار الكتب العلمية، بيروت. الطبعة الثالثة، 1424 هـ - 2003 م.
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- 6- الاستبصار الجامع لمذاهب فقهاء الأمصار وعلماء الأقطار فيما تضمنته الموطأ من معاني الرأي والآثار وشرح ذلك كله بالإيجاز والاختصار. تأليف: أبي عمر يوسف بن عبد الله بن عبد البر النمري القرطبي 368هـ - 463هـ. تحقيق: عبد المعطي أمين قلعجي. دار قتيبة، دمشق - دار الوعي، حلب. الطبعة: الأولى، 1414هـ - 1993م.
- 7- إعانة الطالبين على حل ألفاظ فتح المعين (هو حاشية على فتح المعين بشرح فرة العين بمهمات الدين). تأليف: أبي بكر (المشهور بالبكري) عثمان بن محمد شطط الدمايطي الشافعي (المتوفى: 1310هـ). دار الفكر للطباعة والنشر والتوزيع. الطبعة: الأولى (1418 هـ - 1997 م).
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عنوان البحث : زيادة الضرائب على السلع المحرمة في ضوء السياسة الشرعية

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كلية الشريعة والدراسات الإسلامية

ملخص البحث :

يتحدث البحث عن السياسة الشرعية للدولة في تقليل المحرم عن طريق زيادة الضرائب عليها ورفع أسعارها مما يؤدي إلى تقليل شرائها، حيث تكلم البحث ابتداءً عن تعريف الضريبة والسلع المحرمة وتعريف السياسة الشرعية ثم تحدث عن حكم فرض الضرائب بصفة عامة وكيفية تعامل الدولة مع السلع المحرمة، وأخيراً تعرض البحث لحكم زيادة الضرائب على السلع المحرمة كسياسة للدولة في تقليل المحرم و أوضح الباحث ضوابط شرعية لفرض الضرائب على هذا النوع من السلع وفي الختام ذكر الباحث النتائج والتوصيات والفهارس.

مشكلة البحث :

تكمن مشكلة هذا البحث في أن التعامل في بعض السلع المحرمة كالمدخن والخمور والمشروبات الكحولية أصبح منتشرًا بصورة واسعة النطاق في الكثير من الدول الإسلامية، بحيث لا تستطيع هذه الدول منع هذه السلع مرة واحدة، مما يستوجب البحث عن طرق للحد من تداولها وتناولها تمهيداً لمنعها بالكلية، ومن هذه الطرق: رفع الضرائب على هذه السلع مما يؤدي إلى ارتفاع أسعارها ومن ثم الحد من تداولها.

أسباب اختيار الموضوع :

1- إن بعض السلع المحرمة أصبح تداولها وتناولها مما يعم به البلوى، وتحتاج إلى التفكير في حلول مبتكرة للحد من استهلاكها تمهيداً لمنعها بالكلية.
2- إنني لم أجد من سبق إلى دراسة هذا الموضوع من قبل.
3- إن هذا الموضوع يضيف لبنة إلى الجهود المباركة للجنة العليا للعمل على استكمال تطبيق أحكام الشريعة الإسلامية التابعة للديوان الأميري الكويتي، حيث استطاعت هذه اللجنة تقديم مشروع كامل وتصور شامل عن إحلال الشريعة الإسلامية محل القوانين الوضعية، وما زالت جهودها تتواصل في هذا المجال.

أهداف البحث :

يسعى هذا البحث إلى تحقيق الأهداف التالية:
1- تبين موقف الشريعة الإسلامية من فرض الضرائب على السلع بصفة عامة.
2- تبين موقف الشريعة الإسلامية من التعامل مع بعض المحرمات التي لا يمكن منعها إلا بالتدرج.
3- التعرف على موقف الشريعة الإسلامية من زيادة الضرائب على السلع المحرمة للحد من استهلاكها والإقبال عليها.
4- تبين الضوابط الشرعية لفرض الضرائب على السلع المحرمة.

منهجية البحث :

تمت كتابة هذا البحث وفق خطوات المنهج التالي:
1- جمع المادة العلمية من مصادرها الأصلية من كتب الفقه الإسلامي القديمة والمعاصرة.
2- التثبت من نسبة كل قول إلى قائله، والاجتهاد في التحقق من حقيقة درجة الفعل المحرم.
3- توثيق جميع الأقوال والفتاوى من مراجعها الأصلية، دون الاعتماد على المراجع الوسيطة في نسبة الأقوال أو الأدلة.
4- عزو الآيات القرآنية إلى مواضعها في المصحف الشريف، وذلك بذكر اسم السورة ورقم الآية.
5- تخرīj الأحاديث النبوية من مصادرها من كتب السنة، وفق القواعد العلمية في التخرīj وذلك بذكر الكتاب والباب ورقم الجزء والصفحة، وبيان حال الحديث من حيث القوة والضعف من خلال كلام المحدثين.
6- الاقتصاد في الدراسة على المسائل محل البحث، وعدم الاستطراد إلى موضوعات أخرى.

أهم النتائج :

1- أثبت البحث منهج الشريعة الإسلامية في التدرج في التعامل مع المحرمات ذائعة الانتشار في المجتمع، ذلك المنهج الذي يدل على مراعاة الحكمة والتبصر في مآلات التصرفات.
2- الأصل في الشريعة الإسلامية: أن السلع المحرمة يجب منعها منعاً تاماً، ومنع كل ما يتصل بها من أفعال أو تصرفات، مثل بيعها، أو تصديرها، أو جلبها، أو تصديرها.
3- أثبت البحث بالعديد من الأدلة جواز قيام الحكومة الإسلامية بزيادة الضرائب على السلع المحرمة للحد من استهلاكها وتقليل أعداد المتعاطين لها، تمهيداً لمنعها بالكلية.
4- قدم البحث العديد من الضوابط الشرعية التي ينبغي مراعاتها في حال قيام الحكومات في الدول الإسلامية بزيادة الضرائب على السلع المحرمة تمهيداً لمنعها بالكلية، وهذه الضوابط هي:
أ- الضابط الأول: ألا يكون هناك سبيل إلى منع هذه السلع المحرمة منعاً كلياً.
ب- الضابط الثاني: أن يكون إجراء زيادة الضرائب على هذه السلع ناجعاً إلى الحد من استهلاك السلع المحرمة والإقبال عليها.
ج- الضابط الثالث: أن يكون هذا الإجراء مؤقتاً.
د- الضابط الرابع: ألا يصرف ريع هذه الضرائب في أعمال الربو.

التوصيات البحث :

1- أوصي ولاة الأمور حكام الدول الإسلامية بضرورة الإسراع في تطبيق الشريعة الإسلامية، امتثالاً لأوامر المولى سبحانه وتعالى، ولتبل سعادتي الدنيا والآخرة، ولإصلاح الأوضاع غير المرضية للمسلمين في مشارق الأرض ومغاربها بسبب غياب تطبيق الشرع الخفيف.
2- كما أوصي ولاة الأمور ممن لا يستطيع تطبيق الشريعة بصورة كاملة، أن يسعوا جهدهم في منع المنكرات والمحرّمات، لأن دفع المفاسد مقدم على جلب المصالح.
3- أوصي جميع الحكومات في الدول الإسلامية التي لا تستطيع تطبيق الشريعة في الوقت الراهن تطبيقاً كاملاً، باعتماد أسلوب زيادة الضرائب على السلع المحرمة، للحد من استهلاكها وتقليل أعداد المتعاطين لها فما لا يدرك جلله لا يترك كله.

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عنوان البحث : الدو الإنساني للبنوك الإسلامية العاملة في الكويت

أ.د. كمال توفيق حطاب

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كلية الشريعة والدراسات الإسلامية

تم تمويل البحث مالياً من إدارة الأبحاث بجامعة الكويت برقم (HJ01/14)

أهم النتائج :

بعد اختبار الفرضية الصفريّة الأولى التي تنص على أنه " لا توجد مساهمات إنسانية للبنوك الإسلامية العاملة في الكويت تجاه العاملين" ومن خلال المعالجة الإحصائية للجدول رقم (9) تبين أنه توجد فروق ذات دلالة إحصائية، وبذلك تم رفض الفرضية الصفريّة الأولى . وهذا يعني أن البنوك الإسلامية في الكويت لها مساهمات إنسانية جيدة أو قوية تجاه العاملين لديها.

بعد اختبار الفرضية الصفريّة الثانية التي تنص على أنه " لا توجد مساهمات إنسانية للبنوك الإسلامية العاملة في الكويت تجاه المجتمع " ومن خلال المعالجة الإحصائية للجدول رقم (11) تبين أنه لا توجد فروق ذات دلالة إحصائية، ومعنى ذلك قبول الفرضية الصفريّة ، وبالتالي فإن المساهمات الإنسانية للبنوك الإسلامية تجاه المجتمع تعتبر ضعيفة أو لا تكاد تذكر .

بعد اختبار الفرضية الصفريّة الثالثة التي تنص على أنه " لا توجد مساهمات إنسانية للبنوك الإسلامية العاملة في الكويت تجاه العملاء " ومن خلال المعالجة الإحصائية للجدول رقم (13) تبين أنه توجد فروق ذات دلالة إحصائية، وبذلك فإننا نرفض الفرضية الصفريّة ، وهذا يعني وجود مساهمات إنسانية كبيرة للبنوك الإسلامية العاملة في الكويت تجاه العملاء.

بعد اختبار الفرضية الصفريّة الرابعة التي تنص على أنه " لا توجد مساهمات إنسانية للبنوك الإسلامية العاملة في الكويت تجاه البيئة " ومن خلال المعالجة الإحصائية للجدول رقم (15) تبين أنه لا توجد فروق ذات دلالة إحصائية، ومعنى ذلك قبول الفرضية الصفريّة ، وهذا يعني وجود مساهمات إنسانية كبيرة للبنوك الإسلامية تجاه البيئة.

ملخص البحث :

يهدف هذا البحث إلى بيان وتوضيح مدى فاعلية الدور الإنساني للبنوك الإسلامية العاملة في الكويت، وذلك من خلال الكشف عن مدى التزام هذه البنوك بتطبيق المعايير الإنسانية الاجتماعية. وللوصول إلى هذا الهدف يبدأ البحث بتحديد مفهوم الدور الإنساني وعلاقته بالمسؤولية الاجتماعية، ومن ثم يحاول اكتشاف مدى قيام البنوك الإسلامية بهذا الدور الإنساني. ومن أجل قياس حجم هذا الدور وأهميته وبجالاته المختلفة، تم اختيار عينة من أقدم أربعة بنوك إسلامية كويتية هي (بيت التمويل الكويتي ، بنك بوبيان، وبنك الكويت الدولي، والبنك الأهلي المتحد)، ثم عمل استبانة خاصة بمعايير وبجالات الدور الإنساني للبنوك الإسلامية، ثم وزعت الاستبانة على العاملين في البنوك المشار إليها ، حيث تم توزيع 100 استبانة، اعتمد منها لغايات التحليل والدراسة 63 استبانة.

وقد خلص البحث ومن خلال تحليل نتائج الاستبانة إلى أن المساهمات الإنسانية لهذه البنوك فيما يتعلق بالمجتمع والبيئة ضعيفة أو لا تكاد تذكر ، أما فيما يتعلق بالعملاء والعاملين فإن المساهمات الإنسانية تعتبر قوية، وبناء على ذلك فقد اقترح البحث آليات جديدة لتطوير وتفعيل الدور الإنساني لهذه البنوك.

أهداف البحث :

1. قياس مدى مراعاة الجوانب الإنسانية في البنوك الإسلامية العاملة في الكويت.
2. اقتراح أدوات تكافلية جديدة لتفعيل الدور الإنساني للبنوك الإسلامية.

منهجية البحث :

اعتمدت الدراسة على استخدام عدد من مناهج وأساليب البحث العلمي للخروج بنتائج تُخدم الأهداف التي تجرى من أجلها.

1. المنهج الوصفي التحليلي لدراسة الحقائق ومعرفة الوقائع المتعلقة بواقع البنوك الإسلامية ، وتقييم دورها الإنساني في المجتمع الكويتي ، من خلال الحصول للمعلومات الضرورية والكافية والدقيقة عنها من المصادر الأولية والثانوية.

2. المسح الميداني : حيث يسعى الباحث إلى استقصاء آراء الشرائح والفئات المتعددة ذات العلاقة بموضوع الدراسة وذلك من خلال أسلوب الاستبيان والمقابلات الشخصية مع متخذي القرار في مختلف المجالات ذات العلاقة بالموضوع.

التوصيات :

من خلال تحليل نتائج الاستبانة ظهر جلياً أن الدور الإنساني للبنوك الإسلامية لا يزال في حدود ضيقة جداً، خاصة بما يتعلق بالمجتمع والبيئة ، ولذلك فقد اقترح الباحث في هذه الدراسة أدوات مبتكرة يمكن تطبيقها في البنوك الإسلامية، بشكل عام، وفي البنوك الإسلامية في الكويت بشكل خاص، بحيث تعمل على تفعيل الدور الإنساني المنشود للبنوك الإسلامية، وذلك في ثلاثة مطالب هي :

المطلب الأول : مقترح إنشاء أقسام للقروض المحسنة في البنوك الإسلامية.

المطلب الثاني : مقترح إنشاء أقسام لإنظار المعسرين في البنوك الإسلامية.

المطلب الثالث : مقترح إنشاء صناديق وقيمية في البنوك الإسلامية.

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عنوان البحث : اللغة العربية (نشأتها ومكانتها في الإسلام، وأسباب بقائها)

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كلية الشريعة والدراسات الإسلامية

نتائج البحث :

تعد كلمة اللغة العربية أصيلة، ذات جذور عربية، وتجري في اشتقاقها ودلالاتها على سنن الكلم العربية. اللغة العربية: هي أداة تواصل وتعبير عما يتصوره الإنسان ويشعر به، وهي وعاء للمضامين المنقولة، سواء أكان مصدرها الوحي، أم الحس، أم العقل، وهي أداة لتمحيص المعرفة الصحيحة، وضبط قوانين التخاطب السليم. اللغة العربية: هي اللغة السامية الوحيدة التي قدر لها أن تحافظ على وجودها وأن تصبح عالمية، وما كان ليحقق لها ذلك لولا نزول القرآن الكريم بها؛ إذ لا يمكن فهم كتاب الله تعالى الفهم الصحيح والديق وتدقيق إعجازه اللغوي والبياني إلا بقرائه باللغة العربية. كما أن التراث الغني من العلوم الإسلامية وأمها كتب مكتوبة باللغة العربية. ومن هنا كان تعلم العربية هدفاً لكل المسلمين.

تعتبر اللغة العربية واحدة من اللغات العريقة في العالم الآن، يرجع تاريخها إلى ما يقارب ألف وخمسة مئة سنة، بالشكل الذي نقلته إليها المعاجم التي يرجع تاريخ تدوينها إلى نهايات القرن الثاني الهجري وبدايات القرن الثالث الهجري، ولا سيما بعد ظهور صناعة الورق في البلدان العربية.

تناول الإسلام مفهوم اللغة من زاوية أخرى إضافة لما تحدث عنه علماء اللغة، فاللغة في الإسلام ليست مجرد وسيلة تواصل وترابط إنساني واجتماعي، إنما هي أكثر من ذلك فقد اعتبرت أيضاً نعمة من نعم الله تعالى علينا، منحنا إياها لتمتكن من العيش وتلبية متطلبات الحياة والقدرة على التأقلم والتعايش في المجتمع.

تملك اللغة العربية من المرونة ما لا تملكه لغة أخرى، بحيث يستطيع العرب المحدثون العودة إلى كتب ما قبل الإسلام وفهم نصوصها فهماً جيداً، فالرونة التي تنطوي عليها جاءت نتيجة لطبيعة اللغة العربية.

التوصيات البحث :

- نشر مراكز تعليم القرآن الكريم وحفظه والتركيز عليها من قبل متخصصين ومؤهلين في هذا المجال، كأساس تقويم لغتنا العربية هو التفقه بكتابه الحكيم، وحفظ آياته، وتدبرها.
 - نشر مراكز تعلم وتعليم اللغة العربية والإشراف عليها من قبل معلمين مؤهلين قادرين على ذلك.
 - التركيز على تعلم وتعليم العلوم الشرعية باللغة العربية.
 - التركيز على تعلم العلوم الطبيعية باللغة العربية قدر الإمكان.
 - الإشراف المباشر على المناهج التربوية والتعليمية بحيث تزرع محبة اللغة العربية في نفوس الناشئة.
- وهذه التوصيات لا تعني بالضرورة الانعزال عن التطورات المتسارعة، وعدم التخلف عن ركب الحضارة، بل كل ما علينا أن نعي أكثر باللغة العربية وأن نعطها حقها ومكانتها.

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ملخص البحث :

العربية: هي اللغة التي قدر لها بفضل الله عز وجل أن تستمر وتديم، ولا عجب، فهي لغة القرآن الكريم، حفظت بحفظه إلى يوم الدين، قال تعالى: "إنا نحن نزلنا الذكر وإنا له لحافظون". ومع أن اللغة العربية لغة العرب قاطبة، إلا أنها لغة عالمية يتكلم بها المسلمون في شتى بقاع العالم، فقد كانت اللغة العربية منذ الأزل لغة الفصحاء والبلغاء والخطباء يتباهون فيها في شتى مناسباتهم وخصوصاً عند اعتلاء المنابر، حيث تظهر القدرة البلاغية والبيانية من خلال منابهم، ومع سطوع فجر الإسلام، والقضاء على الجهل والكفر والعصيان، استمر الازدهار، بل واستطاعت أن تتيباً المنزلة الأرفع والأسمى، حيث تمكنت من مواكبة كافة العصور والسبب مرونتها وسعتها وقدرتها على ملائمة العصر الذي تعيش فيه، فأخذت بفضل الله عز وجل المكانة الواسعة إلى أن وصلت لعصرنا الحالي، الذي اعتبرته بعض الجهات عصر الجمود والركود، حيث أخذت جهات معينة من الأدباء والمثقفين تنادي بعزلها والابتعاد عنها، ويرجع السبب بحسب رأيهم إلى أنها غير قادرة على مواكبة تطورات العصر المتسارعة. فكل ما سنحاول قوله هنا: هو التأكيد على أهمية اللغة العربية، وأن الله تعالى هياً لها سبل البقاء والقوة، وكرمها بأنها لغة القرآن الكريم.

أهداف البحث :

هذا البحث يهدف إلى:

1. الكشف عن مدى تأثير اللغة العربية الفصحى بالمجمعات المتتابعة لطمسها.
2. بيان مفهوم ازدواجية اللغة وثنائية اللغة.
3. توضيح موقف العلماء من الدعوة إلى العامية وهجر اللغة الفصحى.

أهمية البحث :

تكمن أهمية البحث في أنه:

الكشف عن تأثير اللغة العربية الفصحى بالمجمعات المتتابعة يلقي الضوء على المشاكل التي واجهت اللغة العربية والجهود المبذولة للتصدي لها. التأكيد على عالمية اللغة العربية وقدرتها على مقاومة التغيير.

مشكلة البحث :

تكمن مشكلة البحث في تعرض اللغة العربية لهجمات متتابعة ومنظمة من قبل دعاة العولمة، ساعين من وراء تلك الهجمات إلى طمس الهوية العربية وإضعافها، عاملين في عدة محاور، نذكر منها: الدعوة الخطيرة والأوسع انتشاراً وهي استبدال العربية الفصحى بالعامية، بالإضافة إلى انتشار ما يسمى "بالعريزية" وهو مصطلح جديد ساهم أيضاً بإضعاف اللغة العربية لدى أهلها، وانتشار اللغة الأجنبية والاهتمام بها وتقديرها على حساب اللغة العربية، متسلحين وداعين من وراء ذلك بأن اللغة العربية لغة قديمة لا تصلح في هذا العصر. فرأيت من الواجب علينا أن نقوم بتصحيح المفاهيم الخاطئة لدى دعاة العولمة بأن اللغة العربية قادرة على مواجهة العولمة اللغوية بكافة أشكالها، والتصدي لها بقوة أكبر، وإظهار قدرات اللغة العربية بأنها قادرة على الوقوف والتصدي لمثل هذه الموجات، وأن لغتنا العربية ترتقي لمستوى هذا التحدي، وفيها من القوة والإتراف لتصلح في كل زمان ومكان. وإنني أدعو الله أن قد وثقت في تقدم هذا البحث لمعالجة هذه المشكلة.

منهجية البحث :

منهجي في هذا البحث هو المنهج الاستقرائي أي الرجوع إلى المصادر والمراجع العلمية كلما تطلب الأمر ذلك، بالإضافة إلى أمم استعدادي في إبداء آرائي وتوجيه النقد إلى الآراء التي أرى أن من حقها النقد، وذلك في دائرة الأدب العلمي، والمنهج الاستدلالي.

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عنوان البحث: الإدارة العامة وأخلاقية التقوى في ضوء القرآن الكريم والسنة النبوية

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ملخص البحث :

هذا البحث محاولة للكشف عن أن مفهوم "الإدارة وأخلاقية التقوى في ضوء القرآن والسنة النبوية" حقيقة تاريخية لا تقبل الشك، عاشها المسلمون فترة طويلة من الزمن، وأن العمل الإداري في النظام الإسلامي بكل أنواعه وأشكاله مسؤولية عظيمة يتطلب جهدا وإخلاصا كبيرين من المكلف به، وإحساسا دائما بالتقوى حتى يكتب له النجاح وهو شريف عزيز، غير محتمل ولا نصاب مهين. إن الإسلام بنظرته الشمولية قدم مفهوما للإدارة يستوعب كافة شؤون الحياة البشرية، وقدم نظاما فريدا في تدبير الله سبحانه وتعالى للأرض والسموات وما فيها. وأسس رسول الله صلى الله عليه وسلم في ضوء هذا النظام الإسلامي الفريد شؤون حكومته الإدارية والقضائية والتنفيذية من مسجده الذي اتخذه مقرا للدولة الإسلامية الوليدة. ثم تطور النظام الإداري في عصر الخلفاء الراشدين خاصة في عهد أمير المؤمنين عمر الفاروق رضي الله عنه. هذا من ناحية ومن ناحية أخرى تناول البحث بشيء من الشرح المناسب مبادئ الإدارة في الإسلام، وأهم العناصر التي يتجلى فيها معنى الإدارة وأدواتها، مثل: التخطيط والتنظيم والتوجيه والرقابة، كما تناول اهتمام القرآن الكريم والسنة النبوية بالتقوى، ومدى أهميته في العمل الإداري الإسلامي، والعوامل التي يكون بها تحقيق التقوى وصلاح القلب.

أهداف البحث :

وانطلاقا مما سبق فإنه مما يهدف إليه بحثنا المتواضع هذا، ويريد مناقشه من خلال عرض هذا الموضوع المهم جدا هو أربع نقاط، وهي الأهداف الرئيسية للبحث:

1. محاولة إظهار الصورة الحقيقية للنظام الإداري في الإسلام.
2. التعرف على أهم مبادئ الإدارة الإسلامية.
3. بيان أهمية أخلاقية التقوى في الإدارة الإسلامية من خلال القرآن الكريم والسنة النبوية.
4. محاولة شرح الموضوع وتحليله تحليلا علميا مستندا إلى الأدلة المستنبطة من القرآن الكريم والسنة النبوية، وسيرة السلف الصالح.

منهجية البحث :

منهجي في هذا البحث هو المنهج الاستقرائي أي الرجوع إلى المصادر والمراجع العلمية كلما تطلب الأمر ذلك، بالإضافة إلى أتم استعدادي في إبداء آرائي وتوجيه النقد إلى الآراء التي أرى أن من حقها النقد، وذلك في دائرة الأدب العلمي، والمنهج الاستدلالي.

أهم النتائج :

1. أن الإدارة وأخلاقية التقوى حقيقة تاريخية عند المسلمين، وأن القرآن الكريم والسنة النبوية اهتمتا بها أي اهتمام، مما يدل على أن لاكرامة ولا حياة شريفة للأمة الإسلامية بغير الإدارة الإسلامية المنبثقة من التقوى.
2. أن الأمة الإسلامية تمر بمرحلة التخلف في حياتها الاجتماعية والسياسية والاقتصادية والأخلاقية إلى حد بعيد، وبالتالي يكون للإدارة الإسلامية الدور الرائد في تحديد الهدف الاستراتيجي وكيفية الاستفادة من طاقات الأمة الإسلامية، حتى تتمكن من التغلب على التخلف الموجود.
3. أن الإسلام بنظرته الشمولية قدم مفهوما للإدارة يستوعب كافة شؤون الحياة البشرية، وبين أن الله سبحانه وتعالى نظاما فريدا في تدبير الأرض والسموات وما فيها. "لَوْ كَانَ فِيهَا أَهَةٌ إِلَّا اللَّهُ لَفَسَدَتَا فَسُبْحَانَ اللَّهِ رَبِّ الْعَرْشِ عَظِيمًا".
4. أن العمل الإداري في النظام الإسلامي بكل أنواعه وأشكاله مسؤولية عظيمة من غير شك. كَلِّمُوا زَوْجَكُمْ مَسْفُوفًا عَنْ زَيْجَبِي: الإمام زاع ومسفوف عن زعيبي، والزجل زاع في أهله وهو مسفوف عن زعيبي، والمرأة زاعية في بيت زوجها ومسفوفة عن زعيبي، والحادم زاع في مال سيده ومسفوف عن زعيبي، قال الراوي: وخبيث أن قد قال: والزجل زاع في مال أبيه ومسفوف عن زعيبي، وكَلِّمُوا زاع ومسفوف عن زعيبي.

5. أسس رسول الله صلى الله عليه وسلم في ضوء هذه العقلية الفريدة الموحاة إليه شؤون الحكومة الإدارية والقضائية والتنفيذية من مسجده الذي اتخذه مقرا للدولة الإسلامية الوليدة في المدينة المنورة على ساكنها أفضل الصلاة وأتم التسليم.

6. لقد شهد النظام الإداري الإسلامي في عصر الخلفاء الراشدين خاصة في عهد أمير المؤمنين عمر الفاروق رضي الله عنه تطورات إيجابية كبيرة وعظيمة في شتى المجالات. إلا أن هذا التطور لم يستمر بالشكل المطلوب في عهد أمير المؤمنين عثمان بن عفان، وعلي بن أبي طالب رضي الله عنهما بسبب الاختلافات التي حدثت بين المسلمين آنذاك.

7. توصلت إلى حقيقة بالغة الأهمية ألا وهي أن هناك مبادئ للإدارة الإسلامية، وعناصر يتجلى فيها معنى الإدارة وأدواتها مثل التخطيط والتنظيم والتوجيه والرقابة، وأن الإدارة الإسلامية المنشودة لا يمكن تحقيقها في دنيا الناس إلا بالتقوى وصلاح القلب.

التوصيات البحث :

1. وجوب الاهتمام الجاد بدراسة موضوع " الإدارة العامة وأهمية أخلاقية التقوى فيها في المنهج الإسلامي " من قبل الأفراد والجماعات والمؤسسات الحكومية وغير الحكومية.
2. جعل هذا الموضوع ضمن المقررات المقررة في الكليات المعنية حتى تتمكن الكلية من تخرج جيل ماهر وواع لمفهوم الإدارة من المنظور الإسلامي.
3. نشر ثقافة أهمية الإدارة من جانب، وأهمية أخلاقية التقوى فيها في المنهج الإسلامي من جانب آخر.

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عنوان البحث : مَعَالِي الْأَخْلَاقِ وَسَفْسَافُهَا وَأَثَرُهَا فِي الْأَدَاءِ الْوُظَيْفِيِّ

أ.د. وليد بن مُحمَّد بن عبد الله العلي

العميد المُساعد لشؤون الأبحاث والاستشارات والتدريب

والأستاذ بقسم العقيدة والدعوة

بكلية الشريعة والدراسات الإسلامية - جامعة الكويت

منهجية البحث :

تتبع النُصوص الشَّرعية من الوحيين المطهرين، ومن ثمَّ تحليلها وتزليلها في مواطنها من البحث، مع العناية بتوثيقها من جهة العزو والتَّحريك، مع توخي الأمانة العلميَّة في كُلِّ ما يُضَمَّن أو يُقتبس من الآثار والأقوال والأشعار، والتَّشويه بكُلِّ ما تمت الاستفادة منه في فهرس المراجع والمصادر العلميَّة.

توصيات البحث :

- 1- ترغب الموظف بحفظ ما أسند إليه من المسؤوليَّة، وذلك بحفظ الأوقات، وحفظ الممتلكات، وحفظ الأمان، وحفظ الجوارح، وحفظ الغُهود، وحفظ الأموال، وبيان أنَّ هذا الحفظ من الأعمال الصَّالحة، وأثمة سبب لبركة الكسب، وكما أنَّ الحفظ من الحاصل المستحسنة، فإنَّ التَّضييع من الحلال المستهجنة، وهو يدلُّ على: نقصان الدِّيانة؛ وهوان الصَّيانة.
- 2- حتَّى الموظف على تعلُّم كُلِّ ما من شأنه الارتقاء بصنعه، ومُتابعتة جميع ما يستجدُّ ويُستحدث من شؤون عمله، والحرص على تعلُّم تفاصيل أمور المهنة والمعرفة بدقائق شؤون الوظيفة، والحذر من الجهل الذي يحمل صاحبه على وضع الشَّيء في غير موضعه.
- 3- عود الموظف إلى التَّحلِّي بالقوَّة التي لا تُخرجه إلى حدِّ كونه في وظيفته ومع رفقته شديداً عتياً، بحيث يُستخر قُوَّته لنفع الآخرين، وتحمله قُوَّته على كظم الغيظ والعفو عن النَّاس، والرَّفْع عن أن يكون عاجزاً عن أداء أعماله، وسبيل ذلك أن يعرف الحدَّ بين توكلِّ القويِّ وتوكلِّ العاجز.
- 4- حضُّ الموظف على لزوم الأمانة في عمله، بأن يكون أميناً في كُلِّ أمرٍ من أموره، وأن لا يُحفظ عليه تقصير ولا يُنتقص بحياته، ويتحلَّى ذلك بأن يُؤدِّي عمله بإخلاص وصدق مُستشعراً أمانة ما أسند إليه، ومتى لم يلتفت إلى حفظ وعلم العامل فهذا من الإضاعة، لأنَّ إسناد الأمر إلى المُقصِّر الجاهل من أضرار الشَّاعة.

بعض مراجع ومصادر البحث :

- 1- أخبار الفضلاء: مُحمَّد بن خلف بن حيَّان الضَّبيِّ المعروف بوكيع - مكتبة المدائن (الرياض) / المملكة العربيَّة السعوديَّة.
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- 3- تاريخ مدينة دمشق وذكر فضلها وتسمية من حلَّها من الأماثل أو اجتاز بنواحيها من واردتها وأهلها: علي ابن الحسن بن هبة الله الشَّافعيُّ المعروف بابن عساکر - دراسة وتحقيق: عُمر بن غرامة العمري - دار الفكر (بيروت/ لبنان) - الطَّبعة الأولى (1417هـ-1997م).
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- 8- مدارج السَّالكين بين منازل إياك نعبد وإياك نستعين: مُحمَّد بن أبي بكر الدَّمشقيُّ المعروف بابن قيم الجوزيَّة - تحقيق: عبدالعزيز بن ناصر الحَلَّيل - دار طيبة (الرياض) / المملكة العربيَّة السعوديَّة - الطَّبعة الأولى (1423هـ).
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مُلخَّص البحث :

إنَّ من نواميس السُّلوك وقوانينه التي لا تتغيَّر ولا تتبدَّل؛ وقواعده الكُليَّة المُطرَّدة المضبَّطة التي لا تزول ولا تتحوَّل: أنَّ الأخلاق الحميدة المستقيمة: يُؤدِّد بعضها بعضاً، كما أنَّ الأخلاق الذميمة السَّقيمة: يُؤدِّد بعضها بعضاً، فمعالي الأخلاق تُؤدِّد في قلب الموظف استشعاره بالمسؤوليَّة وأثمة مُؤمَّنٌ ومُحاسبٌ على ما أُسند إليه من وظيفة، وسفساف الأخلاق تُؤمِّن في صدره حمل أمانة ثقيلة تنوء بحملها السَّمَاوات والأرض والجبال وثُريه أهما خفيفة، فمتى ما اكتنف الموظف الظُّلم والجهل: كان موصوفاً في وظيفته بسفساف الأخلاق الذميمة، ومتى ما تدبَّر براءه العدل وإزار العلم: كان مُتَحَلِّياً في أداء عمله بمعالي الأخلاق القويمة، فبيَّرت عن الظُّلم: الموظفون الأقوياء الأمانة، ويُرَّو من الجهل: العاملون المُحَفَّظُ الغلما، وإنَّ من أمانة التَّعلُّم؛ المرشد لتعليم الأمانة: دلالة أرباب الفطر المستقيمة؛ وهداية أصحاب الغفول السَّليمة؛ لمعرفة أثر معالي الأخلاق الرُّبعية في الأداء الوظيفيِّ المستقيم، ومعرفة أثر سفساف الأخلاق الوضيعة في الأداء الوظيفيِّ السَّقيم.

أهداف البحث :

بيان محاسن الأخلاق الوظيفيَّة؛ وتقرير أشرف السَّحايا المهنيَّة؛ والتعريف بصالح السُّبب العمليَّة؛ والتشويه بمعالي الطُّباع الحرفيَّة؛ والتي لا يُتصوَّر قيام ساقها إلا على: الحفظ؛ والعلم؛ والقُوَّة؛ والأمانة؛ فهذه أربعة أوصاف تدلُّ على: متين الدِّيانة؛ ورضين الصَّيانة؛ فما رُكِّبَ مُوظَّفٌ بمعالي الأخلاق في مسيرته: إلا لأنَّه ممنوعٌ بالحفظ والعلم في سيرته؛ وموصوفاً كذلك بالقُوَّة والأمانة في سيرته، وضدَّ ما تقدَّم أنفأ من معالي الأخلاق الأربعة القويمة التَّقيسة: ما استهجن من سفساف الأخلاق الأربعة الذميمة الخسيسة، فوصف الموظف بحفظ العمل: يقابله وصفه بالتَّضييع والرَّيْل، ووصف العامل بالعلم الرُّبعية: يقابله وصفه بالجهل الوضيعة، ووصف القائم بالقُوَّة وشِدَّة البأس: يقابله وصفه بالعجز وخُور النَّفس، ووصف المُكَلَّف بخسلة الأمانة: يقابله وصفه بضدَّها وهي الخيانة، وملاك ذلك كُلُّه أصلان: اعتدال النَّفس بالقُوَّة، أو احتلال النَّفس بالعجز، فيتولَّد من اعتدال النَّفس بالقُوَّة -الذي هو ثمرَةٌ من ثمار قُوَّة إيمانها-: معالي الأمور ومحاسن الأخلاق؛ من الحفظ والعلم والأمانة، ويتولَّد من احتلال النَّفس بالعجز -الذي هو أثرٌ من آثار ضعف إيمانها-: سفساف الأمور ومسائوئ الأخلاق؛ من التَّضييع والجهل والخيانة.

نتائج البحث :

- 1- إنَّ الله جمع معالي الأخلاق في الأُسوة الحسنة؛ وأودع أشرف الأمور في العُدوة المستحسنة، حيث أتى على نبيِّه صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ وَرَكَدَا، ثُمَّ أَرشَدَ أُمَّتَهُ إِلَى النَّاسِي بِمَحَاسِنِ سَمَائِلِهِ وَهَدَاهُ.
- 2- إنَّ تنميط الأخلاق وتحسين السَّحايا يدلُّ على أهما قابلة للزَّيادة فيرتقي أربابها إلى محاسن الأمور وأشرفها، ومُلاحظة السُّبب ومُعالجة الطُّباع يُرشد إلى أهما مُعرَّضة للتَّقْصَان فيشقى أصحابها بمسائوئ السُّلوك وسفسافها.
- 3- إنَّ أشرف الأخلاق ومعالي الأمور في محبتها وحسنها ذوات أفضان، لكنَّها قد تتبدَّل أو تتغيَّر بحسب ما يُقابِلها من إنسان أو زمانٍ أو مكان، فما من خُلقي من الأخلاق إلا له مقامٌ معلومٌ، وهو المقام الذي تستلطفه النَّفوس وتُدركه النَّفوس.

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عنوان البحث : بُرْهَانُ الصَّدَقَةِ عَلَى الْإِيمَانِ

أ.د. وليد بن مُحَمَّد بن عبد الله العليّ

العميد المساعد لشؤون الأبحاث والاستشارات والتدريب

والأستاذ بقسم العقيدة والدعوة

بكلية الشريعة والدراسات الإسلامية - جامعة الكويت

ملخص البحث :

إنّ من جوامع الكلم الذي فضّل به رسول الله صلى الله عليه وسلّم على جميع الأنبياء والمرسلين؛ إيجاباره عن الصدقة أنّها من أصدق البراهين؛ وعلى إسلام المسلمين؛ وإيمان المؤمنين؛ وإحسان المحسنين، وذلك في قوله: (والصدقة بُرْهَانٌ).

فالصدقة بُرْهَانٌ على الإيمان بالله تعالى؛ إيماناً بربوبيّته؛ وإيماناً بألوهيّته؛ وإيماناً بأسمائه الحسنى وصفاته العلى: الدائنة منها والفعلية، كما أنّ الصدقة بُرْهَانٌ على الإيمان بالملائكة؛ والإيمان بالكتب؛ والإيمان بالرسل؛ والإيمان باليوم الآخر؛ والإيمان بالقضاء والقدر.

أهداف البحث :

- 1- بيان معنى الحديث الشريف وأنّ الصدقة بُرْهَانٌ مُتَحَقِّقٌ، وأنّها دليلٌ على صدق إسلام وإيمان وإحسان المصدّق.
- 2- تعريف الصدقة وأنّها إنّما تُمْتِيت بذلك لأنّها دليلٌ على تصديق أصحابها؛ فالصدقة بُرْهَانٌ صادقٌ على صحة الإيمان الظاهر والباطن من قبل أربابها.
- 3- غرس مفهوم أنّ الصدقة كما أنّها بُرْهَانٌ للمتصدّق وحجّة له على الإيمان؛ فإنّها تبلغ بصاحبها المؤمن الموقن أعلى درجات الدّين وهي درجة الإحسان.
- 4- التأكيد على أنّ الإيمان هو قرين التّفقّة، وأنّ زيادة إيمان المؤمن هو ثمرة الصدقة، فالإيمان والإحسان قرينان، والإنفاق والتّفاق ضدّان لا يجتمعان، لأنّ الإنفاق شعبةٌ من شعب الإيمان، كما أنّ صدّه وهو البُخل والشُّحّ شعبةٌ من شعب الكُفر والسوق والعصيان.
- 5- أنّ براهين الصدقة على إيمان المصدّق كثيرة، وأماراتها وحججها ودلائلها وعلاماتها وفيرة، فما أثبتت الخيرية للمتصدّق؛ إلا لأنّه بعروة الإيمان مُتَوَقِّفٌ.

منهجية البحث :

- 1- اعتماد المنهج الاستقرائيّ وجمع ما يتعلّق بموضوع البحث من النصوص الشرعيّة، ثمّ الانتقال إلى المنهج الاستنباطيّ التحليليّ لتوظيف هذه النصوص الشرعيّة في مواطنها من البحث.
- 2- توثيق النصوص الشرعيّة بعزو الآيات القرآنيّة إلى سورها الكريمة، وتخرّيج الأحاديث الشريفة من مصادرها الأصليّة، وبيان معاني المفردات الغريبة في الحاشية.
- 3- التزام الأمانة العلميّة في نسبة الأقوال إلى قائلها، مع ذكر اسم المرجع ومؤلّفه في الحاشية، وذكر البيانات التفصيليّة له في فهرس المراجع والمصادر العلميّة.

نتائج البحث :

- 1- أنّ الصدقة بُرْهَانٌ على الإيمان وما يتشعب منه من صالح الأعمال، سواء كانت صدقة بالمال أو صدقة بالأفعال أو صدقة بالأقوال.
- 2- أنّ الصدقة بُرْهَانٌ على الإيمان بربوبيّة الله تعالى؛ وأنّه ربّ كلّ شيءٍ ومليكه، والإيمان بألوهيّة الله تعالى؛ وأنّه الإله المستحقّ بأن يُقرّد العبادة التي يُجْهِبها ويرضاها من الأفعال والأقوال الباطنة والظاهرة، والإيمان بأسماء الله الحسنى وصفاته الدّائنة والفعلية؛ التي لا يُسميه فيها أحدٌ ولا يُماتله ولا يُكافئه.
- 3- أنّ الصدقة بُرْهَانٌ على الإيمان بأنّه ما من ملّكٍ من الملائكة إلا له مقامٌ معلومٌ في الأرض أو في السّماء، وأنّ ملكين كريمين ينزلان صبيحة كلّ يوم من السّماء إلى الأرض قد أقامهما الله تعالى للّدعاء، فيدعو أحدهما للمُتَفَقِّين بالعبوديّة والخلف، ويدعو الآخر على المسكين بالمُخِّق والتّلّف.

- 4- أنّ اقتران الصدقة بكتاب الله تعالى؛ للتّنبية على أنّ المصدّق امتثل أمر الله تعالى وعمل بما جاء في مُحْكَم كتابه المبين، وللتّوبية على أنّ كتاب الله تعالى يُرْعَب أولي الفضل والسّعة بالتّصدّق على المساكين.
- 5- أنّ إيمان المصدّق بالأنبياء والمرسلين؛ الذين ورد ذكرهم في الكتاب المبين؛ يدلّ على الاقتداء بسيرتهم الحميدة، ويُرشدّه إلى الاهتداء بمسيرتهم السّديدة، فهم الأسوة الحسنة في ظاهر سيرتهم؛ والقُدوة المستحسنة في باطن سيرتهم، فهم أبسط النَّاسِ يداً وأجودهم مالاً؛ وأسْخاهم نفساً؛ وأطيبهم نفقة؛ وأكرمهم ضيفاً؛ وأوفاهم كيبلاً، فالْمُصَدِّقُ كُلُّمَا كَانَ أَكْثَرَ إِيمَاناً وَتَصَدِيقاً: أعطى عطاءً من لا يخشى الفقر لإدعائنا للموافقة وتحقيقاً.
- 6- أنّ إيمان المصدّق بأنّه سيُؤْتَى في اليوم الآخر بما قدّم وأخّر؛ يُرْعِبُهُ بالصدقة ويُبَصِّرُهُ بأنّ ماله ما قدّم وماله وارثه ما أخّر، فيشعل الإيمان باليوم الآخر وأهواله وعقباته: الإيمان بمُتَمَدِّماتِهِ وعرضاته وحساباته.
- 7- أنّ إيمان المصدّق بما قضاه الله تعالى وقدره عليه مُنذ ولدته أنّه إلى أن يبلغ الأجل: جعله يُنْفِق من سعته ليصير إلى عمل أهل السّعادة ولا يمكث على كتابه ويدع العمل، مُوقِناً أنّ للصدقة تأثيراً عجيبيّاً في المقصود المقدور، فهي تقي المصدّق من أنواع البلاء والشّوء والشّور، فما يكاد يتسلّط عليه شيءٌ من صوارف الدّهور، وإن تسلّط عليه كان مُعاملاً فيه بالطف وأيسر الأمور.

توصيات البحث :

- 1- الحثُّ على صدقة الجهر وبيان أنّها لا تُنابي إخلاص عمل المنفق وصدق نيّته، فزُيْرَتْ صدقة جهري رحمت بصدقة السرِّ لاقتداء النَّاسِ بصديقه وحسن طويّته.
- 2- ترغيب المؤمن بالصدقة وبيان أنّ مولاة سيّوئِهِ الثُّواب والجزاء، لأنّ الإيمان حمل هذا المنفق على التّفقّة رجاء الخلف والعطاء، لاعتماد أنّ الصدقة لا تُنْقِص المال بل تزيد في البركة والنّعماء.
- 3- توضيح أنّ العبد المؤمن إذا أعطى وأنقى فقد مَلَكَ المال، بخلاف العبد السّحيح فإنّه إذا بخل واستغنى فقد مَلَكَه المال، وأنّ المؤمن الكريم يُجْتَدَى بالكرامة واللطيف، وأنّ المنافق التّميم فإنّه يُجْتَدَى بالهانة والغف، فصدقة المؤمن تُجَبِّه إلى أعدائه وأضداده، ويُجَلِّ المنافق يُعْضِضُ إلى أخلائه وأولاده.

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عنوان البحث : الأعداد بين الفيثاغورية والباطنية

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أستاذ مساعد بقسم العقيدة والدعوة

كلية الشريعة والدراسات الإسلامية

الخاتمة والنتائج :

وفي خاتمة هذا البحث أذكر أهم النتائج التي توصلت إليها:

1. العدد عند الفيثاغورية ليس مجموعاً حسابياً مقداراً وشكلاً فحسب؛ بل لم يعرفوه كعلم قائم بذاته، وإنما كمنهج للتوصل إلى الحقيقة اللاحسوسة.
2. المعتقدات التي كانت تدين بما الفيثاغورية لم تكن مجرد أفكار منطقية محدودة، وإنما كانت عقائد باطنية أساسها الشعور الجماعي بالقوة الإلهية السارية في الوجود والحياة الواحدة التي تصل جميع الكائنات ببعضها.
3. الفكر الفيثاغوري هو أول منظومة فكرية أسست رؤيتها إلى العالم على الرياضيات.
4. كان تأثير الفلسفة اليونانية بشكل عام والفيثاغورية بشكل خاص على العقائد والأفكار الباطنية واضحاً حتى أنها عدت مصدراً من مصادرها.
5. يرى الفيثاغوريون أن المبدأ الأول للأشياء هو العدد، مخالفين في ذلك غيرهم من الفلاسفة الذين قالوا: إن أصل العالم هو المادة.
6. ربط الفيثاغوريون الأعداد بمعتقداتهم الدينية، ونسبوا إليها فضائل وأسراراً خاصة .
7. أخذ الباطنية ما قاله الفلاسفة الفيثاغوريون الذين جعلوا كل الأعداد أصولاً لعقيدتهم، وصبغوا آراءهم بالصبغة الإسلامية.
8. يعتبر إخوان الصفا العدد أصل الموجودات؛ ولهذا رتبوه على الأمور الطبيعية والروحانية، واعتقدوا أن الموجودات إنما وجدت بحسب طبيعة العدد وخواصه.
9. الغرض من النظر في العلوم الرياضية عند إخوان الصفا هو الوصول من خلالها إلى علوم الطبيعيات، ثم الصعود والترقي من خلال النظر في الطبيعيات إلى العلوم الإلهية.
10. شارك النصرانية سائر الفرق الباطنية في الاعتقاد في العدد سبعة وأثني عشر.
11. استعمل الدروز الأعداد وأنسوا عقائدهم عليها، ولم يتحرجوا -كغيرهم من الفرق الباطنية- من تأويل آيات القرآن الكريم للدلالة على معتقداتهم.

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ملخص البحث :

يتحدث هذا البحث عن أحد آثار الفلسفة اليونانية على الفكر الإسلامي، إذ من المقرر عند الجميع أن الفرق الإسلامية والأخرى التي تنتسب إلى الإسلام قد تأثرت بالفلسفة اليونانية بمدارسها المختلفة؛ فظهر ذلك الأثر في عقائدها وأصولها ومناهجها في التعامل مع النصوص الشرعية وقضايا الدين الرئيسة، ومن القضايا التي لا بد للمتخصص من معرفتها ومعرفة أصولها قضية الأعداد عند الفرق الباطنية وكيف أتمهم قد أسسوا عقائدهم بل وشرائعهم عليها، وهذا البحث يبحث في أصل هذه القضية في الفلسفة الفيثاغورية موضعاً بشكل خاص - بعد التعريف بالفيثاغورية والباطنية - محددات تلك النظرية عند الفيثاغورية، ثم سريان تأثيرها على عقائد الفرق الباطنية العالية.

المقدمة :

الحمد لله رب العالمين، وأشهد أن لا إله إلا الله وحده لا شريك له، وأشهد أن محمداً عبده ورسوله، صلى الله عليه وعلى آله وصحبه أجمعين، أما بعد:

فإن موضوع الأعداد وعلاقته بالفلسفة والوجود والعلوم الطبيعية والمعاني الباطنية من الموضوعات التي لم تحظ بدراسة تستوي جميع جوانبها، لاسيما أن هذه القضية كانت تشغل حيزاً من الفلسفة اليونانية متمثلة بالمدارس الفيثاغورية وأتباعها، وكما هو معلوم بأن فلسفات اليونان قد أثرت تأثيراً واضحاً على الفرق الإسلامية والفرق التي تنتسب إلى الإسلام؛ إذ التمسك في عقائد الفرق الباطنية على وجه الخصوص يلحظ ذلك التأثير بشكل واضح.

ومن ذلك أتمهم قد أسسوا عددًا ليس بالقليل من عقائدهم بل وشرائعهم على الأعداد، مستندين في ذلك إلى أدلة شرعية -ينتظعون في تأويلها تأويلات باطنية غريبة- وأمور طبيعية لا علاقة لها أبداً بتلك العقائد والأفكار ليدلوا على صحة ما ذهبوا إليه.

ولما كان هذا الأمر ظاهرًا في كتبهم ومؤلفاتهم الأصلية، ومنتشرًا بين أتباعهم، ولم يتناول بالبحث والدراسة المتخصصة على الرغم من كثرة الدراسات والبحوث التي تناولت الباطنية على اختلاف فرقها- كان هذا دافعا لي لسبر تلك العقائد وتتبّع أصولها ومصادرها.

ولما كانت الفلسفة الفيثاغورية لها قدم السبق في الربط بين الأعداد وبين الوجود والعلوم الطبيعية والمعاني الباطنية الإلهية، فقد رأيت أن أقارن بين تلك العقائد الباطنية وبين نظرية العدد عند الفيثاغورين، ومن هنا جاءت فكرة هذا البحث والذي عنونته بـ (الأعداد بين الفيثاغورية والباطنية).

خطة البحث :

اقتضت طبيعة هذا البحث أن أقسمه إلى: مقدمة، وتمهيد، وثلاثة مباحث، وخاتمة.

أما المقدمة: فبنت فيها أهمية الموضوع وسبب اختيارها وخطة البحث.

وأما التمهيد: فجاء فيه تحديد مصطلحات العنوان ويشتمل على التعريف بالأعداد والفيثاغورية والباطنية.

وأما المباحث فهي على النحو التالي:

المبحث الأول: أثر الفلسفة الفيثاغورية في الفكر الباطني.

المبحث الثاني: الأعداد عند الفيثاغورية.

المبحث الثالث: الأعداد عند الباطنية.

وأما الخاتمة: فلنركز فيها أهم النتائج التي توصلت إليها خلال البحث.

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عنوان البحث : فلسفة الرموز في الأديان الشرقية التقليدية – دراسة تحليلية

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الخلاصة والنتائج :

فيما يلي بيان لأهم النتائج التي تم التوصل إليها خلال هذا البحث، ومنها :

1. الرمز الديني يدخل ضمن إطار المقدس الذي يوضح علاقة الإنسان مع الإله الذي يعبده أو العقيدة التي يعتقدها؛ وهذا هو سبب الغلو فيها وتقديسها.
2. رمز الأوم أشهر الرموز وأكثرها قداسة عند الهندوس، وتعود قداسته إلى اعتقادهم أنه البذرة المقدسة الأولى، أو أنه أول لفظ تم النطق به، وأن الكون خلق بواسطته .
3. هذا الرمز فيه إشارة-عندهم- إلى أحد الطرق التي يتحقق للإنسان من خلالها التحرر من الحزن، والوصول إلى الغبطة الحقيقية الأبدية، أو تحقيق الذات، أو الاتحاد.
4. يشير هذا الرمز في الهندوسية إلى شكلين للإله (خالق) براهما؛ سيّد جميع الآلهة في اعتقاد الهندوس والقوة الخالقة للطبيعة.
5. تكاد تنحصر رمزية هذا الرمز منذ القدم في أحد أمرين: القوة، والحظ الحسن.
6. يعتقد الهندوس أن زهرة اللوتس هي الزهرة الأولى التي نُورّت مع بداية خلق الكون، فأصبحت بعد ذلك رمزاً للسلطان الإلهي وعرش الكون.
7. ترمز هذه الزهرة -عندهم- إلى الحيز والبقاء، وهيئتها رمز للحمال والخصوبة، وكثيراً ما يعنون بها الخصوبة الأنثوية، كما تعني الخلق والابتعاث، وترمز للطبيعة المتحددة.
8. عجلة دارما عند البوذية- ويسمونها البعض عجلة القانون- لها ثمانية أطراف ترمز إلى الطريق ذي الشعب الثماني، ويهدفون به قانون بوذا في طريقه إلى التنوير.
9. تحتل زهرة اللوتس مكانة مهمة في الفكر البوذي؛ فالاعتقاد الديني السائد عند البوذية أن بوذا جاء إلى الوجود من زهرة لوتس طافية على سطح الماء.
10. ترمز هذه الزهرة -عندهم- للنقاء والطهارة الكاملة لتلوث الجسم، وقد استخدمت استخداماً واسعاً في تصوير عملية التنوير التي حصلت لبوذا.
11. اكتسبت المرأة والسيوف والجوهره معنى رمزياً يمثّل في الحكمة أو الشجاعة أو الخير أو الذكاء أو الإرادة أو الضحية في علم اللاهوت الشنتوي.
12. البوابة المقدسة أو «الطوري Toji» رمز رئيس عند الشنتوية، ويرمز بها إلى الوصول من العالم الدنيوي إلى عالم الكامي، ومن العلمانية إلى الروحانية.
13. الطاو عند الطاوية رمز للواحد الذي جاء عنه الاثنان، ومن الاثنان جاء الثلاثة، ومن الثلاثة نشأ الكون المخلوق.

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ملخص البحث :

من المقرر عند الجميع أن الدين عنصر أساس في التكوين الفطري للإنسان، قال تعالى: "فأقم وجهك للدين حنيفاً فطر الله الناس عليها لا تبديل لخلق الله ذلك الدين القيم ولكن أكثر الناس لا يعلمون"، إلا أن الناس - كما هو معلوم - منهم من التزم دين الله تعالى القيم الذي أنزله على أنبيائه ورسله، ومنهم من حاد عنه؛ إما إلى أديان أصلها من عند الله (عز وجل) غير أنها حرّفت وبدّلت، أو إلى أديان وضعية أمّا كان واضعها.

والمتمعّن في تاريخ هذه الأديان التي تصرّف فيها البشر، يلحظ أهمّ قد عبّروا عنها وعمّا يقصدونه من معبودات وعقائد برموز دينية تمثل تلك الآلهة أو العقائد، فصار الدين عندهم يتكوّن من مجموعة من العقائد والطقوس والدلالات والمعاني الرمزية.

والسبب في ذلك أهمّ استطاعوا أن يختزلوا جزءاً كبيراً من أفكارهم وعقائدهم ومعانيهم الدينية في صور محسوسة مادية، وإن كانت في أغلبها تعتمد على خرافات وأساطير مزعومة وُجدت في كتبهم أو تناقلوها فيما بينهم؛ أو لأنّ " المعاني يسهل تخزينها في الرموز كما هو في: الصليب والتعبان وغيرها، فالرموز الدينية كما نجدتها في الطقوس أو مرموية في الخرافات تختصر بالنسبة إلى الذين يؤمنون بها كل ما هو معروف عن العالم، وعن الحياة العاطفية التي يدعّمها هذا العالم، وعن الطريقة التي ينبغي للمرء أن يتصرف وفقها، بينما هو يعيش في هذا العالم " .

ومن هنا يظهر لنا أهمية دراسة الرموز؛ إذ تعتبر علماً آخر من المعاني والدلالات التي تختلف صورها وتجسّداتها حسب مهادتها الثقافية والدينية؛ فالرموز عبّر عن الأفكار بشكلها الصوري.

ولذا فإن دراسة الأديان وفهمها متوقف على معرفة رموزها، وإدراك دلالة تلك الرموز وفلسفتها، وبيان ما تحمله من معاني وأثرها على القائلين بها، وعلاقتها بطقوسهم وعقائدهم.

ومن هنا جاءت فكرة هذا البحث، الذي سأقتصر فيه على دراسة أهم الرموز التي باتت تعرف بها الأديان الشرقية التقليدية، وصارت علامة تميّزها عن غيرها. وهذا يعني أن هذه الدراسة تعني بأهم الرموز دون غيرها من الصور والعلامات والشعارات.

أهداف البحث :

يهدف هذا البحث إلى :

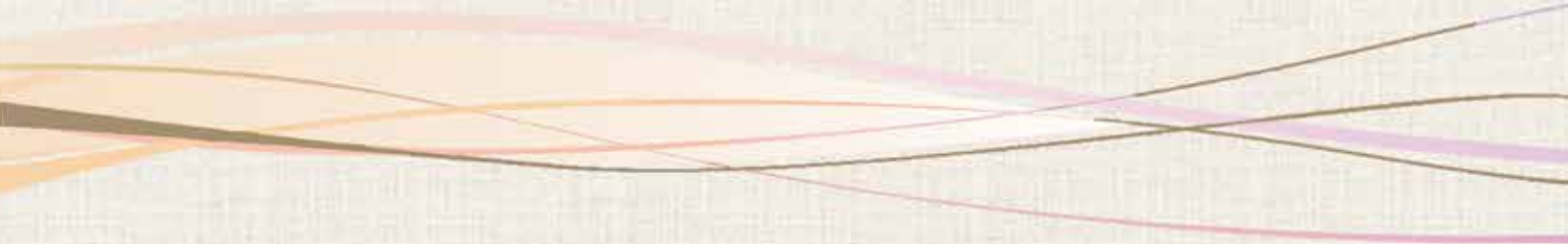
1. بيان مكانة الرمز في الأديان وعلاقته بالعقائد.
2. التعرف بأهم رموز الأديان الشرقية التقليدية.
3. توضيح ما تتضمنه تلك الرموز من دلالات وما تشير إليه من عقائد.
4. بيان علاقة هذه الرموز بأصول تلك الأديان.

خطة البحث :

اقتضت طبيعة البحث أن أقسمه إلى: مقدمة وتمهيد وأربعة مباحث، ثم خاتمة. أما المقدمة فقد اشتملت على: أهمية الموضوع، وسبب اختياره، وخطة البحث. وأما التمهيد فقد بيّنت فيه معنى الرموز، ومكانتها في الأديان، وعلاقتها بالعقائد. وأما المباحث فهي كالتالي:

- المبحث الأول: الرموز في الهندوسية.
- المبحث الثاني: الرموز في البوذية.
- المبحث الثالث: الرموز في الشنتوية.
- المبحث الرابع: الرموز في الطاوية.

وأما الخاتمة، فأوردت فيها أهم النتائج التي توصلت إليها خلال البحث.



الشريعة والدراسات الإسلامية





What makes regulation 'good regulation' ?

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Abstract

There is no recipe for good regulation. However, as the literature on regulation is evolving and beginning to have a distinct shape, identifying principles of good regulation may be achievable whether relating to the regulation as a process or as a final product. The research suggests that there is no 'optimal regulation' as what is optimal from a specific perspective may not be so from another which entails reconciliations in order to reach a better off solution. What is sought to be reached, therefore, is a good regulation and not the best regulation.

Introduction

Regulation is considered to be a significant policy tool that aims at directing the society in the pursuit of achieving policy objectives that underpin regulations. It is, moreover, a sophisticated technique in that it involves different players from policy makers to enforcement officers cutting across different sectors and institutions from governments and administrations to public and businesses.

In a globalized world, regulation intends to attain policy objectives within sophisticated areas and correlations causing complexed direct and indirect impacts.

Discussion

Upon observing the concept of regulation and the regulatory cycle, the research concluded that good regulation entails ensuring a good regulatory process' and a good regulatory 'product' which would, collectively, amount to good regulation.

Regulation as a 'product'

- **Rule formation:** Designing the forms of rules plays a significant role in achieving the underlying policy objectives. Prescriptive detailed rules are believed to be easier in enforcement for their determinacy, though, might quickly become outdated for being over or under inclusive. Principle-based rules, on the other hand, are more flexible, however, their generality may cause uncertainty as they trigger different interpretations and accordingly different applications.
- **Regulatory clarity and consistency:** The main objective of regulations is to be complied with in order to attain the underlying policy objectives. Regulations should be, therefore, designed in a way that could be reasonably clear and consistent to be applied by the addressees. Nevertheless, we occasionally encounter unclear or inconsistent regulations.

Regulation as a 'process'

- **Pre regulatory procedures:** Proposed regulations require careful pre-scrutiny and IMPACT ASSESSMENTS in order to ensure reaching the required outcomes and preventing the occurrence of unintended ones. Pre regulatory procedures should also include stakeholders' consultation as this consultation is in itself considered to be a matter of 'legitimacy' which is based on the fact that as long as regulation is affecting some parts of the society, the voice of those likely to be, directly or indirectly, affected has to be heard in the pre-regulatory process. In addition to the benefit of enhancing their voluntary compliance to the regulations, stakeholders' consultation generates other advantages in that it is a source of data and information specially if the regulated industries are complexed. It also contributes to identifying unintended effects and practical problems.
- **Post regulatory procedures:** There should be an evaluation that assesses to what extent the regulation succeeded/ failed in achieving the policy objectives as intended on the one hand, and if any unintended consequences have occurred on the other. The implemented regulation might, moreover, prove to be even counter-productive and should also be scrutinized (see Kuwait labor law case - figure1). The post regulatory evaluation may, as a result, require regulatory adjustments to maintain the regulation as 'good regulation'.

Methods

The research has an analytical and critical dimension and an evaluative approach touching upon the theory of economic analysis of law.

Objectives

Regulation is a prominent state's tool to control, direct and shape the societies attitude. In today's sophisticated world, attempts must be made to identify the notion of good regulation and to highlight any deficiencies in its presumed features.



Findings and recommendations

• rule formation

Good rule formation would be a matter of balance between the advantages and disadvantages of prescriptive detailed rules on one hand and principle-based rules on the other. Both the frequency of change in the regulated industry, and the level of good faith to comply with regulations are factors in determining the better rule form. In general, an approach towards hybridization between the two forms would amount to a better regulation.

• Regulatory consistency

Good level of communication among relevant regulators would contribute to delivering consistent rules, as the regulators' different views would be reconciled in the pre-regulatory process instead of being clashed within the regulations. Therefore, it would serve in producing consistent regulations, setting a well-established governance framework that sets, *inter alia*, convenient standards of regulators' communications or consolidations in accordance with the level of complexity and correlation of the regulated industries. Moreover, regulation, specially those targeted to the public, should be written in plain language and not lawyers' language.

• Pre regulatory procedures

- Stakeholders' consultations: One of the common ongoing concerns regarding consulting stakeholders is the risk of regulators being captured by stakeholders, therefore, there should exist some objective guidelines in consultations that take into account this risk (see figure2)
- Impact assessments: the cons of pre assessments might, sometimes, outweighs its pros. In emergency cases, for example, (e.g. the occurrence or the continuation of national security threats or incidences), the cost of impact assessments (risks) would be higher than the benefits and thus a good regulation in this case would probably be a 'fast regulation'. However, this must be limited and linked to the emergency situation and not as an excuse to exploit this situation. (see figure 3)

• Post regulatory procedures

There should be a balance between the regulatory adjustments and the regulatory stability. Therefore, constant amendments, as a result of post evaluation, may not be preferable if it evades regulations' stability, consequently, a balance must be struck between the benefits of regulatory amendments and the benefits of regulatory stability and certainty. Hence, if other techniques may serve in rebalancing the outcomes of regulations to maintain as required, then these techniques would be favoured over constant regulatory amendments to ensure the value of stability and certainty. Such techniques include providing specific compensation schemes, or even being passive and leaving it to the market to do the rebalance.

Figure 1: Kuwait Labor law policy is to protect workers

Articles 28&62: prohibiting the reduction of labor wages even with mutual agreement.
Articles 44: permitting contract termination after a 3 months notice to the worker
Rational outcome: under financial difficulties, termination would be a better option for the employer as salary reduction is prohibited
Implication on workers: they are worse off as agreed salary reduction is better than termination!
So: regulation may seem to be counter productive

Figure 2

Regulatory capture is a form of political corruption that occurs when a regulatory agency, created to act in the public interest, instead advances the commercial or political concerns of special interest groups (stakeholders) that dominate the industry or sector it is charged with regulating.

Figure 3: Emergency situations may be viewed as 'golden phases' by the governments to impose what would otherwise be a controversial regulation, as the general public would view any intervention at this stage as justified. In Kuwait, an unprecedented regulation commanding a compulsory DNA test to be taken by all citizens and visitors, days after a terrorist attack in June 2015 is a clear example.

Conclusion

Good regulation is truly an outcome of trade-offs. Thus, regulators should not purport to craft an 'optimal' regulation because it simply does not exist unless from a specific dimension which does not entail being optimal as a whole. Hence, what should be focused on in the discourse of good regulation is the development of good reconciliation strategies and tradeoffs guidelines.

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مدة السقوط

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ملخص البحث

كانت القاعدة في القانون الروماني أنه ليس للوقت ثمة أثر على حقوق الأفراد ، حيث ينبغي على المدين أن يفي بدينه مهما طال الزمن ، ثم مع مرور الوقت ظهرت ما تسمى بمدة التقادم المسقط ، وهذه المدة تخضع للوقف والانقطاع . ثم ظهرت الحاجة ، خلال القرن العشرين ، إلى إيجاد مدة حاسمة للنزاعات أصطلح على تسميتها مدة السقوط وهذه المدة من الناحية التقليدية لا تقبل الوقف ولا الانقطاع . في الحقيقة إن مدة السقوط لم تحظ باهتمام كبير من الفقه ، حيث إن الدراسات المتعلقة بها نادرة جداً على الرغم من أهميتها من الناحية العلمية ، إذ تعج المحاكم بالدفع المتعلقة بمدة السقوط . إن اختيارنا لهذا الموضوع كان نابعاً من الحاجة إلى الإجابة عن جملة من الأسئلة ؛ ما المقصود بمدة السقوط ؟ و هل يوجد لها نظام قانوني خاص بها ؟ و هل ظلت محافظة على نظامها القانوني على الرغم من التطورات الكبيرة التي لحقت بها ؟ و ما حقيقة علاقتها بمدة التقادم المسقط ؟

أهداف البحث

- يهدف البحث إلى تحقيق ما يلي :
- 1- تحديد ماهية مدة السقوط .
 - 2- بيان الجهة التي تملك الاعتراف بوجود مدة السقوط .
 - 3- تحديد النظام القانوني لمدة السقوط .
 - 4- بيان علاقة مدة السقوط بمدة التقادم المسقط .
 - 5- معيار التفرقة بين مدة التقادم المسقط و مدة السقوط .

منهجية البحث

منهج تحليلي وتأصيلي .

النتائج

- أولاً : لا يوجد أساس فلسفي ومنطقي لتبرير وجود مدة السقوط .
- ثانياً : لا يوجد معيار علمي دقيق للتفرقة بين مدة السقوط و مدة التقادم المسقط .
- ثالثاً : إذا كان المشرع الفرنسي يقبل بانقطاع مدة السقوط فمن باب أولى أن يقبل بوقف مدة السقوط

التوصيات

يوصي الباحث في هذه الدراسة باعتبار أن المدتين متماتلتين و لاسيما بعد صدور قانون BADANTAIR في فرنسا 1985 الذي نص على جواز انقطاع مدة السقوط لحماية حق المضرور ، لذلك نتمنى أن يتدخل المشرع الكويتي لتوحيد المدتين ، بحيث تخضع مدة السقوط إلى الانقطاع و الوقف كما هو الحال بالنسبة لمدة التقادم المسقط و ذلك لحماية حق المضرور على غرار القانون الفرنسي .

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LA PRESCRIPTION ACQUISITIVE EN DROIT FRANÇAIS ET EN DROIT ISLAMIQUE



أ.د. سامي عبدالله الدريعي
أستاذ القانون المدني

الملخص:

Historiquement dans les sociétés primitives, la propriété individuelle n'existait pas. L'immeuble appartenait à tous les membres de la tribu, de la famille.

Aux premiers temps de Rome, chaque individu cultivait une parcelle déterminée. Il y avait un partage de jouissance, mais la propriété de la terre restait toujours collective. Au cours du temps, la propriété individuelle est apparue tant à Rome que dans tout l'Occident, surtout à l'époque féodale. La Révolution française reconnaît la propriété individuelle, la considérant comme un droit naturel.

Cependant, force est de constater que la situation de fait pénètre de plus en plus dans la vie juridique. Ainsi en matière civile, le législateur français définit la prescription acquisitive comme moyen d'acquisition de la propriété immobilière. Alors que, sous l'influence du droit islamique, le législateur koweïtien a considéré que l'écoulement du temps, dans certaines conditions, entraîne la non-audition, de l'action. Il en découle que la propriété immobilière même inscrite est toujours menacée par la possession. Il est certain que cette attitude législative ne se réalise pas sans difficultés puisqu'il en résulte une situation paradoxale. Comment peut-on en effet justifier qu'une situation de fait soit prise en compte par la loi, au point qu'il lui arrive de triompher d'une situation de droit ? Nous envisageons cette question dans une première section. Dans une seconde section, nous nous demanderons si le développement des sciences juridiques n'est pas remis en cause par de telles justifications.

أهداف البحث:

- يهدف البحث إلى تحقيق ما يلي:
- 1) معرفة مدى تأثير الوقت على الحقوق المالية.
 - 2) عرض مبررات اكتساب الحق بمضي المدة.
 - 3) دحض الحجج التي سبقت لتبرير سقوط الحق بمضي المدة.

منهجية البحث:

تحليلية ونقدية.

النتائج:

أولاً: عدم سلامة المبررات التي سبقت لتبني فكرة سقوط الحق بمضي المدة.

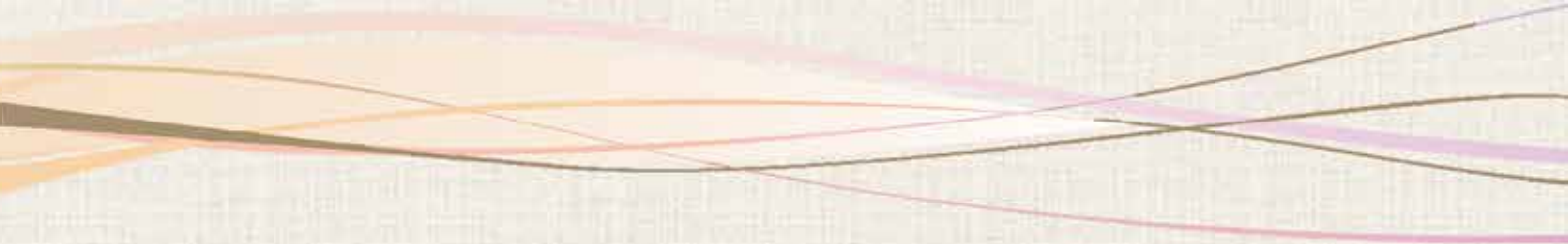
ثانياً: عدم ملائمة فكرة سقوط الحق بمضي المدة مع قواعد الأخلاق والتطور التكنولوجي الهائل التي تمر بها المجتمعات الحديثة.

التوصيات:

يوصي الباحث من خلال هذا البحث إلى تبني ما يسمى بالتسجيل العيني للعقار على نحو يمنع التمسك بالتقادم لكسب الملكية، بحيث إذا تم تسجيل العقار بالسجل العيني تكون الملكية محصنة، ومن ثم لا يجوز للغير أن يكسب هذا الملك بمضي المدة.

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الحقوق



واقع استخدام معلمات التعليم العام في المرحلة الابتدائية بدولة الكويت لشبكات التواصل الاجتماعي وتطبيقاتها في الربط بين الأسرة و المدرسة

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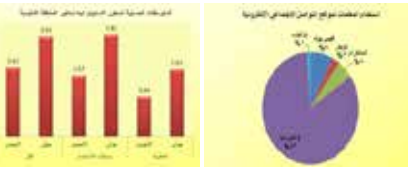
مريم محسن غالب البراك الرشيدى
قسم أصول التربية - كلية التربية - جامعة الكويت

تشير نتائج الجدول رقم (9) إلى أن المتوسط الحسابي لآراء المعلمات في المحور الثالث (اثر الاستخدام) جاء مرتفعا

جدول رقم (9) التكرارات الحسابية والنسب المئوية والمتوسطات الحسابية لمحور اثر الاستخدام

م	مؤلف	متوسط	النسبة المئوية	التكرار	المتوسط الحسابي	النسبة المئوية	التكرار
1	متوسط	4.41	88.2%	10	4.41	88.2%	10
2	متوسط	3.83	76.6%	5	3.83	76.6%	5
3	متوسط	3.25	65.0%	4	3.25	65.0%	4
4	متوسط	2.67	53.4%	3	2.67	53.4%	3
5	متوسط	2.09	41.8%	2	2.09	41.8%	2
6	متوسط	1.51	30.2%	1	1.51	30.2%	1
7	متوسط	0.93	18.6%	1	0.93	18.6%	1
8	متوسط	0.35	7.0%	1	0.35	7.0%	1
9	متوسط	-0.23	-4.6%	1	-0.23	-4.6%	1
10	متوسط	-0.81	-16.2%	1	-0.81	-16.2%	1

ولدت نتائج اختبار (ت) على وجود فروق ذات دلالة إحصائية في آراء المعلمات في محافظتي "حولي" و "الأحمدي" في جميع محاور الاستبيان وهي أهمية الاستخدام ، ومجالات الاستخدام و أثر الاستخدام لمواقع التواصل الاجتماعي في الربط بين الأسرة و المدرسة ، حيث كانت قيم ت لها جميعا ذات دلالة إحصائية عند مستوى دلالة $(\alpha \geq 0.05)$ ، وكانت الفروق في المحاور الثلاثة لصالح معلمات منطقة حولي التعليمية؛ وجاءت الفروق في المحاور الثلاثة لصالح رؤساء الأقسام أيضا. كما دلت نتائج اختبار ف على عدم وجود فروق ذات دلالة إحصائية بين آراء المعلمات في نوع البرنامج المفضل في التواصل الاجتماعي .



التوصيات:

1. سن قوانين تحمي المعلم عند استخدامه لأي شبكة إلكترونية أو تطبيق في التواصل مع ولي الأمر بما يضمن له عدم التعرض للإساءة و تشجيعه على ممارسة عمله بكل حرية
2. الاهتمام بإنشاء مواقع إلكترونية خاصة لكل مدرسة وإعطاء اسم ورقم تسلسلي معروف لكل معلم ومعلمة تحت مظلة وزارة التربية و حمايتها.

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مجتمع الدراسة: تكون مجتمع الدراسة من جميع معلمات المرحلة الابتدائية في منطقة " الأحمدي " و "البالغ عددهن (4465) ، و جميع معلمات المرحلة الابتدائية في منطقة " حولي " التعليمية البالغ عددهن (025) في العام الدراسي 2013 / 2014م . بما يشكل العدد الإجمالي (7490) معلمة .

عينة الدراسة :

تم اختيار عينة الدراسة النهائية المكونة من (1000) معلمة من معلمات المرحلة الابتدائية - سمدارس البنين و البنات في منطقتي " الأحمدي " و " حولي " التعليمية " بدولة الكويت "

أداة الدراسة:

محرور كاتلبي:
المحور الأول : أهمية استخدام المعلمات لشبكات التواصل الاجتماعي وتطبيقاتها في الربط بين الأسرة و المدرسة ، وتكون من عشرة بنود .
المحور الثاني : مجالات استخدام المعلمات لشبكات التواصل الاجتماعي وتطبيقاتها في الربط بين الأسرة و المدرسة وتكون من عشرة بنود .
المحور الثالث : أثر استخدام المعلمات لشبكات التواصل الاجتماعي وتطبيقاتها في الربط بين الأسرة و المدرسة وتكون من عشرة بنود .
وتم تحديد طريقة الاستجابات باستخدام مقياس ليكرت الخماسي (موافق بشدة - موافق - محايد - غير موافق - غير موافق بشدة) .

الإجراءات:

1. تم الحصول على الأوراق الخاصة بتسهيل المهمة بعد توقيعها من مكتب العميد المساعد للشؤون الأكاديمية .
2. الحصول على موافقة قطاع البحث التربوية واستخراج التصاريح المطلوبة بعد ختم الاستبانة .
3. تم الحصول على التصاريح الخاصة بموافقة المناطق التعليمية (الأحمدي - حولي) لتطبيق الأداة في مدارس المرحلة الابتدائية التابعة لكل منطقة .

أساليب المعالجة الإحصائية : استخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية " SPSS " الإصدار العشر- التكرارات الحسابية والنسب المئوية لتكرارات العينة (Frequency- Percent) - مقياس النزعة المركزية من متوسطات حسابية (Means) والحرفات معيارية (Standard deviation) - الإحصاء الاستنتاجي للدلالة الإحصائية (T-Test) للفروق بين المتوسطات في المجموعات المستقلة للمقارنة بين متغيرات الدراسة تحليل التباين الأحادي الاتجاه (One - Way ANOVA) - الارتباطات (Correlation) .

النتائج:

تشير النتائج المبينة بالجدول رقم (7) إلى أن المتوسط الحسابي لآراء المعلمات للمحور الأول جاء مرتفعا ،

جدول رقم (7) التكرارات الحسابية والنسب المئوية والمتوسطات الحسابية لمؤشر المحور الأول (أهمية الاستخدام)

م	مؤلف	متوسط	النسبة المئوية	التكرار	المتوسط الحسابي	النسبة المئوية	التكرار
1	متوسط	4.41	88.2%	10	4.41	88.2%	10
2	متوسط	3.83	76.6%	5	3.83	76.6%	5
3	متوسط	3.25	65.0%	4	3.25	65.0%	4
4	متوسط	2.67	53.4%	3	2.67	53.4%	3
5	متوسط	2.09	41.8%	2	2.09	41.8%	2
6	متوسط	1.51	30.2%	1	1.51	30.2%	1
7	متوسط	0.93	18.6%	1	0.93	18.6%	1
8	متوسط	0.35	7.0%	1	0.35	7.0%	1
9	متوسط	-0.23	-4.6%	1	-0.23	-4.6%	1
10	متوسط	-0.81	-16.2%	1	-0.81	-16.2%	1

تشير نتائج الجدول رقم (8) إلى أن المتوسط الحسابي لآراء المعلمات في المحور الثاني جاء بدرجة مرتفعة ،

جدول (8) التكرارات الحسابية والنسب المئوية والمتوسطات الحسابية لمحور مجالات الاستخدام

م	مؤلف	متوسط	النسبة المئوية	التكرار	المتوسط الحسابي	النسبة المئوية	التكرار
1	متوسط	4.41	88.2%	10	4.41	88.2%	10
2	متوسط	3.83	76.6%	5	3.83	76.6%	5
3	متوسط	3.25	65.0%	4	3.25	65.0%	4
4	متوسط	2.67	53.4%	3	2.67	53.4%	3
5	متوسط	2.09	41.8%	2	2.09	41.8%	2
6	متوسط	1.51	30.2%	1	1.51	30.2%	1
7	متوسط	0.93	18.6%	1	0.93	18.6%	1
8	متوسط	0.35	7.0%	1	0.35	7.0%	1
9	متوسط	-0.23	-4.6%	1	-0.23	-4.6%	1
10	متوسط	-0.81	-16.2%	1	-0.81	-16.2%	1

الملخص:

تأولت هذه الدراسة واقع استخدام معلمات التعليم العام في المرحلة الابتدائية بدولة الكويت وتحديدًا بمنطقتي حولي والأحمدي التعليميتين لشبكات التواصل الاجتماعي وتطبيقاتها في الربط بين الأسرة و المدرسة " وقد تم استخدام المنهج الوصفي لتحقيق أهداف الدراسة ، والتي اتخذت الاستبانة كأداة لها ؛ وتكونت عينة الدراسة من (1000) معلمة في المرحلة الابتدائية في العام الدراسي 2013 / 2014 م ؛ تم اختيارهن بطريقة عشوائية . وأسفرت النتائج عن وجود اتجاهات إيجابية عالية نحو استخدام شبكات التواصل الاجتماعي وتطبيقاتها لربط الأسرة بالمدرسة على جميع محاور الدراسة ، وأشارت النتائج إلى وجود فروق ذات دلالة إحصائية لآراء المعلمات تعزى لمختر المنطقة التعليمية على جميع محاور الدراسة لصالح منطقة حولي التعليمية ، ووجود فروق ذات دلالة إحصائية لآراء المعلمات تعزى لمختر المسمى الوظيفي على جميع محاور الدراسة لصالح رؤساء الأقسام ، كما دلت النتائج على وجود فروق ذات دلالة إحصائية لآراء المعلمات تعزى لمختر التخصص في المواد الأساسية لصالح معلمات (التربية الإسلامية) وفي المواد الفنية (غير الأساسية) لصالح (معلمات التربية الموسيقية) ، كما أظهرت النتائج عدم وجود فروق على جميع محاور الدراسة لآراء المعلمات تعزى لمختر جنس المتعلمين ، كما لم تظهر النتائج وجود فروق لآراء المعلمات تعزى لمختر لتغير سنوات الخبرة . وفي ضوء النتائج التي توصلت إليها الدراسة تم تقديم بعض التوصيات والمقترحات ذات الصلة .

مقدمة:

يعد استخدام شبكة المعلومات العالمية من أهم وأسرع وسائل التكيف والتوعية والتواصل التي يمكن تطويرها لخلق آليات اتصال جيدة بين أولياء الأمور والمعلمين والطالب وإدارات المدارس . كما " أن هذه التكنولوجيا المعلوماتية تعمل على أن يكون هذا السياق مهيا لاستيعاب هذه التكنولوجيا وإفادة مستنها ولابد أن يكون هذا السياق مهيا لاستيعاب هذه التكنولوجيا وإفادة مستنها " (صالح ، 2001 : 58) . ومواقع التواصل الاجتماعي الإلكترونية قد تمد المدارس بأدوات جديدة من أجل التواصل مع أولياء الأمور وإظهارهم بشأن أولادهم و عن العملية التعليمية فيها بكافة ممارستها ونشاطاتها ، لذا صار من الضروري التعرف على آراء المعلمات حيال استخدامهن لشبكات التواصل الاجتماعي الإلكترونية . لربط الأسرة بالمدرسة لما قد يحققه من تواصل تعليمي وتربوي بنسب ، وأن يكون استخدام التكنولوجيا فرصة من أجل تحقيق ذلك .

مشكلة الدراسة:

1. ما أهمية استخدام شبكات التواصل الاجتماعي وتطبيقاتها في ربط الأسرة بالمدرسة من وجهة نظر المعلمات ؟
2. ما مجالات استخدام المعلمات لشبكات التواصل الاجتماعي وتطبيقاتها للربط بين الأسرة والمدرسة ؟
3. ما أثر استخدام المعلمات لشبكات التواصل الاجتماعي وتطبيقاتها لربط الأسرة بالمدرسة ؟
4. هل توجد فروق ذات دلالة إحصائية بين آراء المعلمات حول استخدام شبكات التواصل الاجتماعي وتطبيقاتها لربط الأسرة بالمدرسة وفقا للمتغيرات التالية (المنطقة التعليمية - المسمى الوظيفي - جنس المتعلمين - التخصص - سنوات العمل - أكثر شبكات التواصل الاجتماعي الإلكترونية وتطبيقاتها استخداماً) ؟

أهداف الدراسة:

1. التعرف على مجالات استخدام المعلمات لشبكات التواصل الاجتماعي وتطبيقاتها في الربط بين الأسرة و المدرسة .
2. التعرف إلى الفروق بين المعلمات حول استخدامهن لشبكات التواصل الاجتماعي وتطبيقاتها للربط بين الأسرة و المدرسة تبعاً لبعض المتغيرات (المنطقة التعليمية - المسمى الوظيفي - جنس المتعلمين - التخصص - سنوات العمل - أكثر شبكات التواصل الاجتماعي استخداماً) .
3. التعرف على التوصيات المقترحة لاستخدام الأمل لشبكات التواصل الاجتماعي وتطبيقاتها للربط بين الأسرة و المدرسة .

مصطلحات الدراسة:

شبكات التواصل الاجتماعي وتطبيقاتها Social Network Service (SNS) :

يعرف " راضي " مواقع التواصل الاجتماعي بأنها " منظومة من الشبكات الإلكترونية تستعمل تقنية (Web2) التي تسمح للمستخدم فيها بإنشاء موقع خاص به ، و من ثم ربطه من خلال نظام اجتماعي إلكتروني مع أعضاء آخرين لديهم الاهتمامات والهوايات نفسها " . (راضي ، 2003 : 23) .

منهج الدراسة:

اعتمدت الدراسة الحالية على المنهج الوصفي التحليلي ، والذي بدوره يستخدم المقابلات والاستبيانات لمعرفة الآراء والتصورات وبالتالي يتم التوصل إلى البيانات والتفسيرات التي في ضوئها يتم استخراج النتائج .



أثر اللغة المحفزة في مقاومة التغيير

لدى معلمي مدارس التعليم العام بدولة الكويت

The Impact of motivating language in teacher's resistance to change in Kuwait public schools

أطروحة مقدمة لدرجة الماجستير في التربية (الدرجة الوحيدة) - مسار الإدارة التربوية

المؤلفة: د. سعاد سعد الهاجري

مقدمة من العالمة: أنوار فاهد الهرشاني

ملخص الدراسة

هدفت هذه الدراسة إلى التعرف على تصورات المعلمين حول استخدام وإساءة الأسماء العنصرية لتسمية المحفزة، ولصعوبة فهم الدرجة مقصودها لتغيير في مدارس التعليم العام بدولة الكويت. وقد أُنعت الدراسة المنهج التحليلي للأدلة طبيعة الدراسة الذاتية التحليلي هذا النهج، إذ استخدمت استبيانان هما: اللغة المحفزة ومقاومة التغيير، وتم تطبيقهما على عينة (936) معلمة ومعلمة، وباستخدام الأدوات الإحصائية المناسبة، فوجدت الدراسة أن عدد من النتائج: (1) يتزايد إساءة الأسماء العنصرية في اللغة المحفزة بدرجة عالية لدى المدرسات المعلمين (ب) يتزايد المعلمين بدرجة متوسطة بعد تصورات المعلمين (ج) لغة فروع ذات دلالة إحصائية في استخدام وإساءة الأسماء العنصرية لتسمية المحفزة والدرجة التعليمية (د) لغة فروع ذات دلالة إحصائية في مقاومة المعلمين لتغيير لغة تسمية المحفزة (هـ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة (أ) صاغ المعلمين في مدارس التعليم العام بدولة الكويت كان له أثر ذو دلالة إحصائية في مقاومة المعلمين لتغيير بحدس استراتيجيات الأسماء العنصرية، وفي ضوء النتائج، خرجت الدراسة بتوصيات ذات صلة منها: (1) ضرورة توعية المسلمات التربويين في مدارس التعليم العام عبر الورش والدورات التدريبية، وأهمية النوع في الخطاب اللغوي باستخدام المسماة اللغة المحفزة (2) اللغة المناسبة عند التحدث للمعلمين، لغة صاغ المعلمين (ب) الحد من مقاومة المعلمين لتغيير من خلال توفيرهم بالمعلومات والقرارات المناسبة بالتعبير والترافيم في عملية اتخاذ تلك القرارات (ج) ضرورة تركيز وإساءة الأسماء العنصرية لتسمية المحفزة على المعلمين في خطابهم خلال فترات التغيير، لتحد من مقاومة التغيير التي قد تظهر نتيجة عيوب الأسماء التي لا تتناسب مع إمكانيات وموارد البيئة التعليمية.

نتائج الدراسة

النتائج الأولى: تصورات المعلمين حول استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت
تبدت النتائج من عينة الإحصائية الكلية لتصورات أفراد عينة الدراسة حول عينة الدراسة حول استخدام وإساءة الأسماء العنصرية لتسمية المحفزة، وقد أظهرت استبيانات العينة حسب نوع الجنس من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة من حيث درجة الإحصائية، إذ احتل بعد اللغة العنصرية فهدمة الترتيب الشدة التي إن الأسماء العنصرية بعد لغة التحدث للمعلمين، والآخر احتل لغة صاغ المعلمين.

المتغيرات	المتوسط الحسابي	الانحراف المعياري	درجة الحرية
لغة التحدث للمعلمين	4.35	0.682	936
لغة صاغ المعلمين	4.31	0.710	936
لغة التحدث للمعلمين	4.30	0.501	936
لغة صاغ المعلمين	4.2	0.658	936

النتائج الثانية: تصورات المعلمين لدرجة مقاومتهم لتغيير في مدارس التعليم العام بدولة الكويت
تبدت النتائج من عينة الإحصائية الكلية لتصورات أفراد عينة الدراسة حول عينة الدراسة حول درجة مقاومتهم لتغيير في مدارس التعليم العام بدولة الكويت، وقد أظهرت استبيانات العينة حسب نوع الجنس من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة من حيث درجة الإحصائية، إذ احتل بعد اللغة العنصرية فهدمة الترتيب الشدة التي أكثر الأسماء العنصرية في مقاومة المعلمين لتغيير. بعد اللغة التي لا تتناسب مع إمكانيات وموارد البيئة التعليمية.

المتغيرات	المتوسط الحسابي	الانحراف المعياري	درجة الحرية
لغة التحدث للمعلمين	3.02	0.735	936
لغة صاغ المعلمين	3.39	0.889	936
لغة التحدث للمعلمين	3.31	0.500	936
لغة صاغ المعلمين	3.00	0.671	936

النتائج الثالثة: صلات فروع ذات دلالة إحصائية في تصورات المعلمين حول استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت
تشهد نتائج التباين التفاضلي أن صلات فروع ذات دلالة إحصائية في تصورات المعلمين حول استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت، وقد أظهرت استبيانات العينة حسب نوع الجنس من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة من حيث درجة الإحصائية، إذ احتل بعد اللغة العنصرية فهدمة الترتيب الشدة التي أكثر الأسماء العنصرية في مقاومة المعلمين لتغيير. بعد اللغة التي لا تتناسب مع إمكانيات وموارد البيئة التعليمية.



أهداف الدراسة

- 1. التعرف على تصورات المعلمين حول استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت.
- 2. التعرف على تصورات المعلمين لدرجة مقاومتهم لتغيير في مدارس التعليم العام بدولة الكويت.
- 3. تحديد مدى تأثير معيار (التعبير العنصرية، عدم العدالة، التقليل، العنصرية، المرحلة التعليمية) على تصورات المعلمين تجاه استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت.
- 4. تحديد مدى تأثير معيار (الجنس، العنصرية، عدم العدالة، التقليل، العنصرية، المرحلة التعليمية) في مقاومة المعلمين لتغيير في مدارس التعليم العام بدولة الكويت.
- 5. التعرف على صلات فروع ذات دلالة إحصائية في تصورات المعلمين حول استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت.

منهجية الدراسة

اعتمدت الدراسة التحليلية على المنهج التحليلي للأدلة، وذلك من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت.

عينة الدراسة

تكون مجتمع الدراسة العنصرية من جميع المعلمين في مدارس التعليم العام في المرحلة الابتدائية والمتوسطة والثانوية، في المناطق التعليمية الست بدولة الكويت، في الفصل الدراسي الثاني 2015-2015. وقد تم اختيار عينة العنصرية، وفقا لأسلوب العينة العشوائية العنصرية البسيطة (Cluster Sample)، التي تعطي كل فرد في مجتمع الدراسة فرصة متساوية وأن يتم اختياره ضمن عينة الدراسة. وقد تم اختيار العينة بصورة عشوائية، وذلك لأن مجتمع الدراسة - التمثيل في العنصرية - كبير ومتناثر على مساحة جغرافية واسعة، وأعداد كبيرة، وهي تعرض وصفي وتتضمن لعدد من الأسماء العنصرية لتسمية المحفزة، المرحلة التعليمية، العنصرية، مقاومة التغيير، والآخر. على عكس ذلك، تم اختيار العينة من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت، وقد أظهرت استبيانات العينة حسب نوع الجنس من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة من حيث درجة الإحصائية، إذ احتل بعد اللغة العنصرية فهدمة الترتيب الشدة التي أكثر الأسماء العنصرية في مقاومة المعلمين لتغيير. بعد اللغة التي لا تتناسب مع إمكانيات وموارد البيئة التعليمية.

أدوات الدراسة

اعتمدت الدراسة العنصرية الأداة الأولى، إذ لها بعد أكثر أدوات البحث التحليلي المستخدمة في البحوث الكمية والأدلة العنصرية منها، وقد استخدمت في دراسة من قبل فهد العنصرية، وفيها استخدمت (Mayfield & Mayfield, 2009) ودراسة (Ong et al., 2008) كعناوين مقاومة التغيير، وقد تم ترجمة الأداة وتكثيفها لتسمية العنصرية، وتكونت أداة الدراسة من ثلاثة أجزاء رئيسية هي: الجزء الأول: استبيان التغيرات الديموغرافية، وهي تعرض وصفي وتتضمن لعدد من الأسماء العنصرية لتسمية المحفزة، المرحلة التعليمية، العنصرية، مقاومة التغيير، والآخر. على عكس ذلك، تم اختيار العينة من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت، وقد أظهرت استبيانات العينة حسب نوع الجنس من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة من حيث درجة الإحصائية، إذ احتل بعد اللغة العنصرية فهدمة الترتيب الشدة التي أكثر الأسماء العنصرية في مقاومة المعلمين لتغيير. بعد اللغة التي لا تتناسب مع إمكانيات وموارد البيئة التعليمية.

توصيات الدراسة

1. ضرورة توعية المسلمات التربويين في مدارس التعليم العام عبر الورش والدورات التدريبية، وأهمية النوع في الخطاب اللغوي باستخدام المسماة اللغة المحفزة (2) اللغة المناسبة عند التحدث للمعلمين، لغة صاغ المعلمين (ب) الحد من مقاومة المعلمين لتغيير من خلال توفيرهم بالمعلومات والقرارات المناسبة بالتعبير والترافيم في عملية اتخاذ تلك القرارات (ج) ضرورة تركيز وإساءة الأسماء العنصرية لتسمية المحفزة على المعلمين في خطابهم خلال فترات التغيير، لتحد من مقاومة التغيير التي قد تظهر نتيجة عيوب الأسماء التي لا تتناسب مع إمكانيات وموارد البيئة التعليمية.
2. ضرورة تركيز وإساءة الأسماء العنصرية لتسمية المحفزة في مدارس التعليم العام بدولة الكويت، وقد أظهرت استبيانات العينة حسب نوع الجنس من حيث: (أ) إن استخدام وإساءة الأسماء العنصرية لتسمية المحفزة من حيث درجة الإحصائية، إذ احتل بعد اللغة العنصرية فهدمة الترتيب الشدة التي أكثر الأسماء العنصرية في مقاومة المعلمين لتغيير. بعد اللغة التي لا تتناسب مع إمكانيات وموارد البيئة التعليمية.

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مستوى الثقة برئيس القسم وأثره على رغبة المعلم بالانتقال من المدرسة

The level of trust in head of department and its impact on teacher's intent to leave present school

Dr. Salem Saad Alhajeri
Dr. Ahmad Salamah Alanezi

قسم الإدارة والتخطيط التربوي

كلية التربية

د. سالم سعد الهاجري
د. أحمد سلامة العنزي

المخلص

تهدف الدراسة الحالية إلى معرفة أثر درجة الثقة برئيس القسم على رغبة المعلمين بالانتقال من مدارسهم الحالية إلى مدارس أخرى. ولتحقيق هدف الدراسة استخدم الباحثان الداتين: الأولى لقياس درجة الثقة، والثانية لقياس مدى رغبة العينة بالانتقال. وقد طُبقت الدراسة على عينة، قوامها (381) معلماً ومعلمة، وتوصلت إلى عدة نتائج، منها: وجود فروق في درجة الثقة تبعاً لمُتغير جنس العينة وسنوات الخبرة، بينما لم يكن هناك فروق تبعاً لمُتغير الجنسية. وفيما يتعلق بالرغبة في الانتقال من المدرسة أظهرت النتائج أنه ليس هناك فروق تبعاً لمُتغير الجنس، بينما كان هناك فروق تبعاً لمُتغير الجنسية وسنوات الخدمة. كما وجدت الدراسة أن درجة الثقة برئيس القسم تتنبأ برغبة المعلم بالانتقال، واختتمت الدراسة بالتوصيات والاقتراحات.

أهداف الدراسة

تهدف الدراسة الحالية إلى معرفة درجة ثقة المعلمين برؤساء أقسامهم، وكذلك الكشف عن أثر بعض المتغيرات الديموغرافية على درجة الثقة. وتهدف أيضاً إلى معرفة مدى رغبة أفراد العينة بالانتقال من مدارسهم الحالية إلى مدارس أخرى، والكشف عن أثر بعض المتغيرات الديموغرافية على تلك الرغبة. كما تهدف هذه الدراسة إلى معرفة أثر درجة الثقة برئيس القسم على مدى رغبة المعلم في الانتقال من مدرسته الحالية.

إجراءات الدراسة

تمثلت إجراءات الدراسة على التالي:

استخدم الباحثان المنهج الوصفي الارتباطي لتطبيق هذه الدراسة، حيث سمح هذا المنهج بدراسة العلاقات الارتباطية بين المتغيرات المختلفة (المحطاني، العامري، آل مذهب، والعمر، 2000). مجتمع الدراسة وعينها

تألف مجتمع الدراسة من جميع معلمي ومعلمات التعليم العام بدولة الكويت. أما عينة الدراسة فقد اختيرت تبعاً للطريقة العشوائية العنقودية، حيث تم اختيار مدرستين عشوائياً من كل منطقة تعليمية (المناطق التعليمية الست؛ بواقع مدرسة للذكور وأخرى للإناث من كل منطقة تعليمية، وذلك يكون مجموع المدارس (12) مدرسة. ووزعت الاستبانة على جميع المعلمين في المدارس المختارة، استرجع منها (381) استبانة صالحة، والجدول التالي يوضح الخصائص الديموغرافية لعينة الدراسة.



أهداف الدراسة: استعان الباحثان باستبانتيين للإجابة عن تساؤلات الدراسة:

الاستبانة الأولى: تتعلق بقياس الثقة، وقد اعتمد الباحثان في إعدادها على الأدب النظري والدراسات السابقة وبشكل كبير على دراسة (Hoy & Tschanned-Moran, 2003). وقد قيمت عيرات التقييم على مقياس خماسي الدرجات (دائماً = 5؛ غالباً = 4؛ أحياناً = 3؛ نادراً = 2؛ أبداً = 1). وكانت جميع العبارات إيجابية بالمتابعة الجارة رقم 14.

الاستبانة الثانية: تقيس رغبة المعلمين بالانتقال من المدرسة وتنبأت بالاعتماد على الأدب النظري. وقد احتوت على خمس عبارات، وكان المقياس المستخدم لاسجابات العينة مقياساً خماسياً (موافق بشدة = 5؛ موافق = 4؛ محايد = 3؛ غير موافق = 2؛ غير موافق بشدة = 1). صدق الأدوات: تم التحقق من صدق الأدوات، وذلك باستخدام صدق المحتوى (Content Validity)، وكذلك صدق التكوين (Construct Validity).

صدق المحتوى: عُرضت الأدوات على خمسة من أعضاء هيئة التدريس في قسم الإدارة والتخطيط التربوي في جامعة الكويت، وكذلك على أربعة معلمين من وزارة التربية؛ وذلك لإدلاء آرائهم حول وضوح العبارات من حيث المعنى ومناسبتها لكل مجال من مجالات الدراسة، وتم تعديل الاستبانة بناء على ملاحظات المحكمين ومقترحاتهم.

صدق التكوين: وكذلك تم التأكد من الصدق وذلك باستخدام التحليل العاملي (Factor Analysis) بأسلوب (Principal Component Analysis) المتكامل من صدق التكوين (Construct Validity) للأدوات المستخدمة في الدراسة الحالية، وبالاعتماد على قيمة (KMO) والتي كانت أعلى من (6,0)، حيث بلغت في أداة الثقة (0,92)، وفي أداة الرغبة في ترك المدرسة (0,79)، وقد كانت قيمتا (KMO) الداتين إحصائياً عند مستوى 0,05. فقد كانت تشيقات استبانة الثقة في العامل الأول عالية ويتضح أنها كلها تشيقت وارتبطت في عامل واحد يعبر عنه في الدراسة الحالية بـ "الثقة برئيس القسم"، وكذلك أداة الرغبة بترك المدرسة تشيقت في عامل واحد يعبر عنه في الدراسة الحالية بـ "رغبة المعلم في الانتقال من مدرسته الحالية". وعليه، فقد تم التحقق من صدق التكوين للأدوات الحاليين.

ثبات الأدوات: للتحقق من ثبات الأدوات قام الباحثان بتطبيقها على عينة استطلاعية (Pilot Study) من مجتمع الدراسة (N = 36) بطريقة الاستقاس الداخلي كرونباخ-ألفا (Cronbach-Alpha). فكان الثبات لاستبانة الثقة (0,91)، ولإستبانة الرغبة في الانتقال (0,84). وهذا يدل على ثبات الأدوات بثبات عالٍ، ويدل كذلك على الاتساق الداخلي للأدوات وتماسك عباراتها، بحيث إنها تقاسم ما وضعتا من أجله.

التحليل الإحصائي: مستخدمت التوسلات الحاسوبية والاحتراف المعيارية للإجابة على السؤال الأول والسؤال الثالث. مستخدمت اختبار T-Test للمجموعات المستقلة (Independent Sample) للإجابة على السؤال الثاني والرابع والخامس بتغير الجنس والجنسية. مستخدمت اختبار One Way ANOVA للإجابة على الأسئلة المتعلقة بالمتغير ذي المستويات الأكثر من اثنين (سنوات الخدمة).

مستخدم الباحثان تحليل الانحدار الخطي البسيط (Simple Linear Regression) للإجابة على السؤال الخامس والمتعلق بمعرفة أثر الثقة برئيس القسم على رغبة المعلم بالانتقال من مدرسته الحالية.

تطبيق الدراسة
محصل الباحثان على الموافقة من وزارة التربية لتطبيق الدراسة.

أكد الباحثان على المشاركين أن الإشتراك في الدراسة اختياري وأن إجاباتهم ستحاط بالسرية التامة وسوف تستخدم لغراض البحث العلمي فقط.

نتائج الدراسة ومناقشتها

في هذا الجزء سيتم عرض النتائج ومناقشتها.

النتائج المتعلقة بالسؤال الأول: ما مستوى الثقة بين المعلمين ورؤساء أقسامهم من وجهة نظر المعلمين؟

من خلال استخدام التوسلات والاحتراف المعيارية أُجيب عن السؤال السابق على النحو الموضح في الجدول التالي.

الدرجة	م	ن
1. يثق المعلمون برئيس القسم.	3.64	10.4
2. تتوافق أفعال رئيس القسم مع أقواله.	3.48	9.5
3. يحترم المعلمون رئيس القسم.	3.96	9.9
4. يتصف رئيس القسم بالزاهة.	3.86	10.1
5. يهتم رئيس القسم بمشكلات المعلمين.	3.92	11.3
6. يعبر رئيس القسم عن مشاعره بصراحة.	3.27	10.7
7. يصدق رئيس القسم المعلمين.	3.96	10.1
8. يؤدي رئيس القسم أعماله بكفاءة.	3.78	10.3
9. يظن رئيس القسم المعلمين على ما يدور حولهم.	3.65	10.1
10. يراعى رئيس القسم مصلحة المعلمين.	3.70	10.1
11. يتكلم رئيس القسم المتعلمون مع المعلمين.	3.83	10.7
12. يتكلم أفعال رئيس القسم بعجاب المعلمين.	3.59	10.2
13. يصرح رئيس القسم برأيهم مع مشاعرهم.	3.27	10.3
14. يُثير أفعال رئيس القسم الريبة.	3.22	10.3
15. يظن رئيس القسم بغيره.	3.92	10.4
16. يمتلك رئيس القسم الخبرة.	3.92	10.2
الأداة ككل	3.60	7.1

من الجدول السابق يتبين أن مستوى الثقة برئيس القسم جاء بمستوى متوسط، وتتفق هذه النتيجة مع دراسة (الشرفي والنظر، 2013). وعند النظر إلى العبارات نجد أن عبارة "يحترم المعلمون رئيس القسم" حصلت على أعلى متوسط تلتها عبارة "يسانء رئيس القسم المعلمين" ومن العبارات تبيين أن رئيس القسم يحظى بالاحترام، وأنه يقوم بدوره في الوفاء إلى جانب المعلمين عند الحاجة، في حين أتت عبارة "أعمال رئيس القسم تثير الريبة" في المرتبة الأخيرة بأقل متوسط وحلّ فيها عبارة "يصرح المعلمون رئيس القسم بمشاعرهم"، وعبارة "يعبر رئيس القسم عن مشاعره بصراحة".

النتائج المتعلقة بالسؤال الثاني: هل هناك اختلافات ذات دلالة إحصائية بين آراء أفراد العينة حول مدى تكتهم برؤساء أقسامهم تبعاً لمتغيرات الدراسة، وهي:

• الجنس: كُشف اختبار T-Test أن هناك فروق ذات دلالة إحصائية بين التوسلات الحاسوبية في درجة ثقة المعلمين برؤساء أقسامهم، وذلك لصالح الذكور؛ بمعنى أن درجة ثقة المعلمين برؤساء أقسامهم أعلى من درجة ثقة العلمات برئيسات أقسامهن.

• جنسية المعلمين: كُشف اختبار T-Test أنه لا توجد فروق ذات دلالة إحصائية بين التوسلات الحاسوبية في درجة ثقة المعلمين برؤساء أقسامهم تبعاً لمُتغير الجنسية؛ أي أن تصورات العينة تجاه درجة الثقة لا تختلف باختلاف جنسية المعلم، والنتيجة الحالية تتفق مع دراسة (Ball, 2010)، وهذا قد يدل على أن المعلمين على اختلاف جنسياتهم يحفظون بالمعاملة نفسها من قبل رئيس القسم، ولا يوجد هناك تحيز (Partiality) لجنسية دون أخرى.

• سنوات الخدمة: استخدم اختبار One-Way ANOVA للإجابة عن السؤال الحالي، وكانت النتيجة أن هناك فروق ذات دلالة إحصائية في مستوى الثقة تبعاً لمُتغير سنوات الخدمة وللمعرفة اتجاهات الفروق استخدم الباحثان اختبار توكي البعدي.

كُشف الاختبار البعدي أن ثقة المعلمين ذوي سنوات الخدمة من (4-1) برؤساء أقسامهم أعلى من ثقة أفرادهم ذوي سنوات الخدمة من (8-5) و(9) فاكتر؛ بمعنى أنه كلما طُقت سنوات الخدمة زادت ثقة المعلمين برئيس القسم. وهذه النتيجة تختلف عن نتائج كل من دراسة إسكندر (2007) ودراسة (Ball, 2010) ودراسة (Kursunoglu, 2009)، ويمكن تفسير ذلك بأن المعلم صاحب الخبرة من 1-4 سنوات يرى في رئيس القسم خبرة تعني عليه جانباً كبيراً من الثقة، أو قد يكون راجعاً إلى أن المعلمين الجدد لم يتسنى لهم معرفة رئيس القسم بشكل تكفيف لهم سلوكياته المتعلمة.

النتائج المتعلقة بالسؤال الثالث: ما درجة رغبة المعلمين بالانتقال من مدرستهم الحالية إلى مدرسة أخرى؟

للإجابة عن السؤال السابق استخرجت التوسلات والاحتراف المعيارية لبيد الاستبانة كما هو موضح في الجدول التالي.

العبرة	م	ن
1. أفكر بالانتقال إلى مدرسة أخرى.	2.17	13.8
2. لو كان الخيار يبدي لانتقلت إلى مدرسة أخرى.	2.77	14.3
3. أتحب دائماً عن العمل.	1.93	10.9
4. أترادى دائماً فكرة الانتقال إلى مدرسة أخرى.	2.84	13.4
5. أتنقص فكرة الانتقال إلى مدرسة أخرى مع الوقت.	2.80	13.0
الأداة ككل	2.60	11.0

يتضح من التوسلات أن رغبة المعلمين بالانتقال من المدرسة الحالية إلى مدرسة أخرى جاءت بمتوسط (2,60)، وبانحراف معياري (1,10)، وهذه النتيجة تستدعي الحاجة إلى دراسات مستقبلية لتلويح على الأسباب الكامنة وراء الرغبة بالانتقال.

النتائج المتعلقة بالسؤال الرابع: هل هناك اختلافات ذات دلالة إحصائية بين آراء أفراد العينة حول رغبتهم بالانتقال من المدرسة تبعاً لمُتغير الدراسة، وهي:

• الجنس: يتضح من نتائج الاختبار عدم وجود فروق ذات دلالة إحصائية بين التوسلات الحاسوبية في رغبة المعلمين بالانتقال وفقاً لمُتغير الجنس. وهذه النتيجة تتفق مع كل من دراسة (Luekens, Lyter, & Fox, 2004) ودراسة (Theobald & Michael, 2004). بينما اختلفت مع نتيجة دراسة (Ingersoll, 2001) التي توصلت إلى أن معدل انتقال النساء أعلى منه لدى الرجال. وقد توقع الباحثان خلاف ذلك نتيجة، حيث توقعوا أن تكون رغبة الذكور أعلى، لما ينبغي على طبع الذكور من تتمر مقارنة بالنساء، كما ذكر (خليل وشريب، 2008).

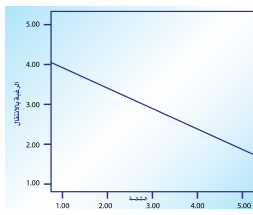
• جنسية المعلمين: تبين وجود فروق ذات دلالة إحصائية بين التوسلات الحاسوبية في رغبة المعلمين بالانتقال من المدرسة تبعاً لمُتغير الجنسية، وذلك لصالح الكويتيين؛ أي أن رغبة الانتقال بين المعلمين الكويتيين أعلى من رغبة غير الكويتيين.

• سنوات الخدمة: استخدم اختبار One-Way ANOVA للإجابة عن السؤال الحالي، وقد أظهرت النتائج أن هناك فروق ذات دلالة إحصائية في الرغبة بالانتقال تبعاً لمُتغير سنوات الخدمة. ولمعرفة اتجاهات الفروق استخدم الباحثان اختبار توكي البعدي.

كُشف الاختبار البعدي أن رغبة المعلمين ذوي سنوات الخدمة من (4-1) في الانتقال أعلى من أفرادهم ذوي سنوات الخدمة (9 فاكتر). بمعنى أنه كلما زادت سنوات خدمة المعلم قلت رغبته في الانتقال من المدرسة. وانفتحت النتيجة الحالية مع دراسة (Boe, Bobbitt, Cook, Whitener, 1997, Weber)، واختلفت جزئياً مع دراسة (Ingersoll, 2001). وهذه النتيجة منطقية؛ حيث إن وجود المعلم لعدّة سنوات في المدرسة نفسياً يجعله يعتاد على المدرسة وجوّها العام، وكذلك على التعامل معه على اختلاف مستوياتهم.

النتائج المتعلقة بالسؤال الخامس: هل هناك أثر لدرجة ثقة المعلمين برؤساء الأقسام على رغبة المعلمين بالانتقال من مدارسهم الحالية؟

كُشف اختبار الانحدار البسيط (Simple Regression) محسوبة هذا التأثير؛ فقد بلغت قيمته (R² = 11,0)، مما يعني أن درجة الثقة تفسر ما مقداره 11% من التباين في الرغبة بالانتقال من المدرسة الحالية، كما يتضح من النتائج الإحصائية الواردة في الجدول نفسه ومن خلال قيمة B التي بلغت 0,34، ويشير النموذج إلى أن درجة الثقة برئيس القسم تتنبأ عكسياً وبدلالة إحصائية برغبة المعلم بالانتقال من مدرسته الحالية إلى مدرسة أخرى، أي أنه كلما زادت درجة الثقة برئيس القسم قلت رغبة المعلم بالانتقال من مركز عمله الحالي، والعكس صحيح. وهذه النتيجة تتفق مع ما توصلت إليه حكم من دراسة (Stawski, Deal, & Runderman, 2010) ودراسة (Reid, 2008) (Stawski) من أنه كلما زادت الثقة بالرئيس زادت احتمالية بقاء الموظف. ويضيف كل في قرار (Deal, & Runderman, 2010) أن درجة الثقة بالرئيس تؤثر على النساء أكثر من الرجال في قرار البقاء في المنظمة؛ أي أن درجة الثقة تؤثر في رغبة الإناث في البقاء أكثر من أقرانهم الذكور.



التوصيات

- لتعزيز رغبة المعلمين بالبقاء في مدارسهم، لا بد لروساء الأقسام من العمل على زيادة ثقة المعلمين بهم من خلال:
- الإبداع في الأفعال التي من شأنها تظليل الثقة بينهم وبين المعلمين كإجراءات المفاجئة واستبدالها بالزيارات المنقطة عليها مسبقاً.
- اتباع الشفافية في تعاملهم مع المعلمين وإطلاعهم على الأمور التي تتعلق بهم كمتسوهم التدريسي وتقديرهم السنوية.
- إشراك المعلمين ذوي سنوات الخدمة العالية في إدارة الأقسام العلمية إلى جانب رؤساء الأقسام.
- إعداد دورات وورش عمل لروساء الأقسام من أجل تثقيفهم في بناء الثقة مع معلمهم.
- أن يدرس رؤساء الأقسام والإدارة المدرسية طبقات الفقل ليقوا على الأسباب الكامنة وراءه.

المقترحات

- القيام بإجراء دراسة مستقبلية تعلق على أثر الثقة على أداء المعلمين.
- القيام بإجراء دراسة مستقبلية لمعرفة العوامل الأخرى المؤثرة في رغبة المعلم بالانتقال.

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Politeness and Power in School Board Meetings: A Qualitative Study of Selected Public Schools in Kuwait

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Introduction

Managers in organizations spend approximately 90% of their time in verbal interaction (Laufer, Shapira & Telem, 2008; Morand, 2000). Verbal interaction in organizations not only furthers collegiality but can also uncover power relationships.

These power relationships are linked to the way individuals interact with each other. Victoria (2009), in her study of politeness and power during social interaction in business meetings, found evidence that politeness goes hand in hand with the exercise of power in the workplace. Although politeness might be clear in concept and application, power is not necessarily so. In other words, power is controversial (Fairclough, 1989; Morand, 2000; Raven, 2008; Truter, 2008). This controversy is based on the multiple sources of power (Raven, 2008). It could be institutional, (e.g., are those placed higher in the organization always more powerful than their subordinates?) Or it could be interactional, (i.e., is it derived from politeness (e.g., Does politeness in interactional situations give individuals some kind of power?)).

These two main questions can pave the way for the central thesis of this research and certainly merit further study, specifically in the organizational and educational domains, the context of which is ideal for discussing and exploring the complex relationship between politeness and power (Mulyati, 2004).

Purpose of the Study

The purpose of this study is to explore the relationship between politeness and power through the multifaceted interactions that occurred between members during public school board meetings in selected public schools in Kuwait.

Literature Review



Figure 1. Centering around the phenomenon of politeness and power, the literature revealed four categories that play significant roles in the exploration of the phenomenon.

Method

This phenomenological research aims to generate meaningful units about politeness and power through the narrative analysis of events and participants' behaviors in school board meetings. The central question guiding this study is: "How is power related to politeness in school board meetings?"

Research Design

It was the objective of this qualitative research to obtain rich, meaningful information based on the observation of participants' interactions during public school board meetings. Collected observations would help to explore the phenomena of politeness and power. A semi-structured observation protocol was developed for this purpose. The data analysis process in this study followed Simka and Koeszagi's (2007) guidelines for generating categories, themes, or maybe theories for the obtained data. This process as Figure 2 shows, contains five major stages which are interactive and interrelated.

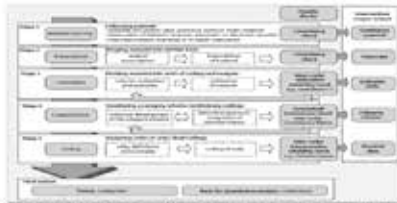


Figure 2. Guidelines for the Qualitative Data Analysis Process, adapted from Simka & Koeszagi (2007)

Data Quality Procedures

Creswell (2014) suggested eight primary strategies to establish the accuracy and quality of findings. He recommended applying one or more strategies in one study to enhance the validity level. In this study three main validity strategies are incorporated: data sources triangulation, reflexivity, and external audit.

Participants and Selection

The study is conducted with only three schools. Those three schools were related to the purpose of the study and met the main selection criteria of having a good reputation, an information rich environment, and meetings conducted on a regular basis. The participants of those school board meetings were mainly heads of departments, vice-principals, and principals. Most of them were Kuwaiti; a few were from other Arab nationalities. The average age of the participants was between 35 and 45. Mostly, the participants were derived from the same social and ethnic group; this means that they were all Muslims and Arabs.

Limitations

There were three limitations to this qualitative study:

- nature of the purposeful sample selection process;
- the use of the observation as a sole data collecting method;
- small sample size and location of the study limits the transferability of the findings to similar contexts; and
- use of specific theoretical models in analyzing the phenomenon politeness and power.

Findings

Table 1.
Overall Characteristics of School Board Meetings

Characteristic	Meeting A	Meeting B	Meeting C
Topical Management	Spiral	Linear	Mixed, of spiral and linear nature
Power Exercise	Mostly hidden and covert	Obvious and overt	Overtly from one head teacher
Politeness Strategies	Used overtly from the principal, and covertly from some participants	Used sparingly from principal, yet overtly from teachers	Not explicitly activated
Physical Environment	Principal's office room	Formal Meeting Room	Principal's office room
Formality	Low	High	Low
Decision Making	Spiral	Spiral	Spiral
Degrassion/Off style	High	At minimum	High
Participants	The meeting's attendees numbered 13: the principal, the 2 vice-principals, 7 heads of department	The meeting's attendees numbered 18: the principal, the 2 vice-principals, 13 heads of the principal, the 2 vice-principals, 11 heads of department; for elective courses	The meeting's attendees numbered 14: the principal, the 2 vice-principals, 11 heads of department

Note: If the nature of decision-making process and topical management is spiral, then it indicates a collaboration and agreement made between the meeting chair (i.e. principal) and participants of a meeting. Linear, on the other hand, means that the decision-making process and topical management is made solely by one party (i.e. the meeting chair or the participant).

Overall, the major findings were generally in accordance with published (relevant) literature. School A board meeting represented how politeness was a source of power as well as how linguistic analysis, if used solely, can yield to invaluable insights. School B board meeting revealed that politeness could regularly be used for power mitigation. This meeting also proved that politeness in interactional situations gave individuals some kind of power. Finally, School C board meeting depicted the relation between politeness and face-threatening acts, and indicated that if there is a threat (e.g. anger, criticism, evaluation or even a request), then politeness could mitigate power.

Conclusions & Recommendations

The themes emerged in this study were (a) politeness could be considered as a source of power; (b) linguistic analysis of politeness, if used solely, is not sufficient to explain the phenomenon of politeness and power; (c) politeness, in some occasions, is a mitigation strategy, especially in face-threatening acts.

Based on the obtained data, the main recommendations were: (a) linguistic behavior in organizations is a domain that needs in-depth examination in order to see its gestalt; (b) politeness is should be seen as a tool that goes behind personality traits and that could be acquired and developed; and (c) for organizational purposes, politeness could be defined in a template form for accepted and appropriate behaviors within, so individuals will be aware of the appropriate behavior expected from them.

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أسباب التحاق الطلبة بمؤسسات التعليم العالي الخاصة في دولة الكويت في ضوء بعض المتغيرات

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قسم الإدارة والتخطيط التربوي - كلية التربية

ملخص

هدفت الدراسة إلى التعرف على آراء الطلبة الدارسين بمؤسسات التعليم العالي الخاصة من حيث أسباب التحاقهم بالجامعات والكليات الخاصة، وقد تم إجراء دراسة ميدانية لتحقيق هدف الدراسة من خلال إعداد استبانة، تكونت من (23) بنداً، ووزعت الاستبانة على عينة تكونت من (1280) طالباً وطالبة، وقد أسفرت نتائج الدراسة عن أن الطلبة أوصحوا أن هناك العديد من الأسباب التي دفعتهم نحو اختيار مجال الدراسة في مؤسسات التعليم العالي الخاصة، منها: الرغبة في الدراسة باللغة الأجنبية، ومواكبة التطور للعلوم العلمية والتكنولوجية، وتوافر أجواء الحرية، وسرعة الحصول على القبول للدراسة فيها، وتطور أساليب الدراسة، ووجود العديد من التخصصات التي تتناسب مع احتياجات سوق العمل،

مقدمة

حرصت العديد من الدول على إنشاء مؤسسات التعليم العالي الخاصة تلبية لاحتياجات المجتمع من توفير فرص تعليمية لمخرجات الثانوية والتي أصبحت تتزايد في السنوات الأخيرة، وعدم قدرة الجامعات الحكومية على استيعاب الأعداد الكبيرة، وتشجيع الاستثمار الاقتصادي في مجال التعليم العالي بتعاون القطاع الخاص في تأسيس تلك المؤسسات. ومن منطلق أهمية مؤسسات التعليم العالي الخاصة، صدر القانون رقم (34) عام 2000 بإنشاء الجامعات الخاصة في دولة الكويت والتي تهدف إلى تحقيق أهداف التعليم العالي والتعليم التطبيقي بما يساهم في خدمة المجتمع، كما صدر مرسوم مجلس الجامعات العالي للإشراف على مؤسسات التعليم العالي الخاصة بالدولة. ويختص بكل ما يتعلق بقواعد وإجراءات الترخيص بإنشاء المنشآت التعليمية الخاصة، والنظر في طلبات إنشاء المنشآت التعليمية الخاصة، وتحديد متطلبات الاعتماد الأكاديمي، واعتماد برامجها ومراجعة أدائها، واعتماد المعايير والشروط الواجب توافرها في البرامج الدراسية في تلك المنشآت.

أهداف الدراسة

- 1- التعرف على أسباب التحاق الطلبة بمؤسسات التعليم العالي الخاصة بدولة الكويت.
- 2- التعرف على تأثير كل من نوع المؤسسة، ونوع الطلبة، وجنسياتهم في توضيح آرائهم بشأن أسباب التحاقهم بتلك المؤسسات.

منهجية الدراسة

تم استخدام المنهج الوصفي التحليلي لتحقيق أهداف الدراسة؛ وذلك للتعرف على وجهة نظر الطلبة حول أسباب التحاقهم بمؤسسات التعليم العالي الخاصة في دولة الكويت، بالإضافة إلى تحليل البيانات التي تم الحصول عليها من تطبيق أداة الدراسة على أفراد العينة. وقد طبقت الاستبانة على عينة عشوائية تكونت من 1280 طالب وطالبة من بعض الجامعات والكليات الخاصة بدولة الكويت، هي:

- 1- جامعة الخليج للعلوم والتكنولوجيا Gust
- 2- الجامعة الأمريكية AUK
- 3- الجامعة العربية المفتوحة AOU
- 4- الكلية الأسترالية ACK
- 5- كلية بوكسهل الكويت BHCK

نتائج الدراسة

السؤال الأول: ما أسباب التحاق الطلبة بمؤسسات التعليم العالي الخاصة في دولة الكويت؟

هناك العديد من العوامل المؤثرة على التحاق الطلبة بالجامعات الخاصة، وقد حظي 12 بنداً على استجابة مرتفعة من الطلبة، بينما حظي 11 بنداً على استجابة متوسطة، ومن أهم العوامل المؤثرة على التحاق الطلبة بمؤسسات التعليم العالي الخاصة هو رغبة الطلبة في الدراسة باللغة الأجنبية وخاصة اللغة الإنجليزية، وقد حقق هذا البند استجابة مرتفعة، حيث إن معظم الجامعات والكليات الخاصة تتم الدراسة فيها باللغة الإنجليزية، وهذا ربما يفسر أن أغلبية الطلبة الملتحقين فيها من الطلبة الذين لديهم إلمام باللغة الإنجليزية والذين يرون سهولة استكمال الدراسة باللغة ذاتها، إضافة إلى وجود العديد من الطلبة المتفوقين باللغة الإنجليزية من مخرجات المدارس الثانوية الحكومية والخاصة، وكذلك وجود العديد من المقررات التمهيدية لتقوية مستوى الطلبة باللغة الإنجليزية، كما أن أغلبية الطلبة الملتحقين بتلك المؤسسات من خريجي المدارس الثانوية الخاصة الإنجليزية والأمريكية والذين يحرصون على استكمال الدراسة الجامعية باللغة الإنجليزية، حيث لا يرون هناك صعوبات في ذلك، وقد حقق هذا البند المرتبة الثانية

ومن العوامل أيضاً سرعة الحصول على قبول للدراسة، وهذا يفسر أن شروط الالتحاق بتلك المؤسسات واختيار التخصص قد يكون أسهل من شروط الالتحاق بالمؤسسات الحكومية، مثل جامعة الكويت والتي يتطلب الالتحاق بها الحصول على معدل مرتفع في الثانوية، إضافة إلى اختيارات القدرات الأكاديمية المحددة لبعض الكليات العلمية والإدارية والتي تحتسب درجتها مع نسبة الثانوية لاحتساب المعدل المكافئ، وقد تقل نسبة بعض الطلبة مما لا يمكنهم من الالتحاق بالكلية التي يرغبون فيها، وخاصة للطلبة المتفوقين، وبالتالي يلجئون للجامعات الخاصة للالتحاق بالكلية التي يرغبون فيها كالمهندسة مثلاً.

الجدول (1)

المتوسطات الحسابية والاحترافات المعيارية ودرجة الاستجابة مرتبة تنازلياً لنبود أسباب الالتحاق بمؤسسات التعليم العالي الخاصة

الرقم	البند	المتوسط الحسابي	الانحراف المعياري	درجة الاستجابة
1-	أرغب في الدراسة باللغة الأجنبية	3.92	1.078	مرتفعة
2-	لا أخرج مدرسة ليلية أو خاصة في المرحلة الثانوية	3.89	1.454	مرتفعة
3-	مواكبة نظم التعليم للتقدم العلمي والتكنولوجي	3.65	1.115	مرتفعة
4-	توافر أجواء الحرية في المؤسسة	3.60	1.219	مرتفعة
5-	سرعة الحصول على قبول للدراسة فيها	3.59	1.162	مرتفعة
6-	تطور أساليب الدراسة في المؤسسة	3.58	1.153	مرتفعة
7-	يوجد بها تخصصات تتناسب مع احتياجات سوق العمل	3.57	1.135	مرتفعة
8-	سهولة اختيار التخصص العلمي الذي أرغب فيه	3.53	1.186	مرتفعة
9-	تطور مستوى الخدمات والأنشطة الطلابية	3.53	1.146	مرتفعة
10-	أرغب في تجربة الدراسة في مؤسسة ذات ثقافة أمريكية، أو بريطانية، أو أسترالية	3.52	1.195	مرتفعة
11-	تتسبب أوقات الدراسة مع التزامات تطرفي العائلية	3.52	1.136	مرتفعة
12-	كفاءة وجود مستوى التدريس	3.50	1.177	مرتفعة
13-	بديل عن الدراسة في الجامعات الخارجية	3.48	1.333	متوسطة
14-	سرعة الحصول على الوظيفة في سوق العمل	3.48	1.171	متوسطة
15-	لا اعتقد أن مخرجات التعليم الخاص أفضل من مخرجات التعليم الحكومي	3.47	1.204	متوسطة
16-	مرونة أعضاء هيئة التدريس وسهولة التواصل معهم	3.42	1.214	متوسطة
17-	حصولي على بيئة دراسية من الحكومة	3.37	1.481	متوسطة
18-	جاذبية المناهج للفقر المتوسطة	3.33	1.328	متوسطة
19-	أدنى التكلفة على تعلم الدراسة	3.23	1.208	متوسطة
20-	جاذبية جمال مبنى المؤسسة	3.11	1.423	متوسطة
21-	عدم قبولي بمؤسسات التعليم العالي الحكومية	3.10	1.412	متوسطة
22-	أرغب بدراسة تخصص غير متوافر في مؤسسات التعليم العالي الحكومية	3.09	1.279	متوسطة
23-	سهولة دراسة المقررات الدراسية	3.09	1.189	متوسطة

السؤال الثاني: ما الفرق بين استجابات أفراد العينة على بنود الاستبانة وفقاً لمتغير النوع، والجنسية، ونوع المؤسسة؟

أوضحت الدراسة أنه لا توجد فروق ذات دلالة إحصائية بين وجهات نظر كل من الطالبات والطلاب حول أسباب التحاقهم بمؤسسات التعليم العالي الخاصة، لكن أشارت الدراسة إلى وجود فروق ذات دلالة إحصائية بين وجهة نظر الطلبة الدارسين في الجامعات والكليات الخاصة، وذلك لصالح طلبة الكليات الخاصة. كما اختلفت وجهات النظر بين طلبة الكليات الخاصة لصالح كلية بوكسهل الكويت، وأيضاً اختلفت وجهات النظر بين طلبة الجامعات الخاصة لصالح جامعة الخليج للعلوم والتكنولوجيا. كما أشارت الدراسة إلى وجود فروق ذات دلالة إحصائية بين الطلبة الكويتيين وغير الكويتيين، وذلك لصالح الطلبة الكويتيين.

التوصيات

- 1- الاهتمام بمتابعة مستوى جودة مخرجات مؤسسات التعليم العالي الخاصة العاملين في مختلف قطاعات الدولة الحكومية والخاصة للتعرف على مستوى الكفاءة المهنية لهم.
- 2- الاهتمام بإنشاء مؤسسات التعليم العالي المتخصصة في مجال معين وفق احتياجات سوق العمل من المهن والوظائف المتخصصة النادرة في الطب والهندسة والتقنيات، مما يساهم في تأهيل مخرجات بمستوى متميز للعمل في قطاعات الدولة.
- 3- تشجيع القطاع الخاص على إنشاء مؤسسات تعليم عال غير ربحية ذات تكلفة منخفضة لتمكين الطلبة من مختلف المستويات الاقتصادية من الالتحاق بها وتقليل الفوارق الطبقية بين الطلبة وخاصة الطلبة الذين لا تنطبق عليهم الحصول على البعثات الداخلية للالتحاق بمؤسسات التعليم العالي الخاصة.
- 4- أن تهتم مؤسسات التعليم العالي الخاصة بتوثيق الصلة مع مختلف مؤسسات المجتمع؛ لمعرفة احتياجاتها من تخصصات، ونوعية المخرجات والخبرات والمهارات الواجب توافرها لديهم، والتعاون معها في توفير فرص التدريب الميداني للطلبة بما يساهم في توفير احتياجات مؤسسات المجتمع من مخرجات مؤهلة علمياً وعملياً.

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Pre-Service Teachers' Academic Achievement and Attitude towards Using Tablet PC in English Pronunciation التحصيل الأكاديمي لمعلمي ما قبل الخدمة واتجاهاتهم نحو استخدام الحاسوب اللوحي في نطق اللغة الإنجليزية

Abstract

The problem underlying the present paper was to determine the effects of courseware in tablet PC-based instruction method in pronunciation skills of pre-service teachers in the college of Education at Kuwait University and their attitudes towards using tablet PC during this experience. After completing courseware work, pre-service teachers in both the experimental and the control groups took part in an achievement test in pronunciation skills and measured by an attitude scale to determine the attitudinal impact of using tablet PC as an instructional tool. Findings revealed an improvement in pronunciation skills and in the development of a positive attitude in favour of tablet PC-based instruction method. Conclusions and final recommendations were forwarded at the end.

Key Words: Pre-Service Teachers- Academic Achievement- Attitude- Tablet PC.

Objectives

This study aims at:

- Investigating the effectiveness of tablet PC-based instruction into pronunciation skills in English students at the College of Education, Kuwait University.
- Seeking to tap into students' attitudes towards pronunciation upon training on tablet PC-based instruction.
- Presenting classroom settings with innovative tablet PC technologies in order to promote the learning process.
- Enhancing pre-service teachers' tablet PC skills to be ready for their future schools.

Methodology

Population and Sample:
The total number of target population was (287) of pre-service English teachers. Subjects of the study included (120) which constitute (44.9%) of the target population. They were randomly selected as clustered of classes and randomly assigned to both the experimental and the control group. Previous achievement tests as well as observations of the students' performance in Phonetics and Conversation indicated that the population of the study are normally distributed and there were no big differences between the subjects in their pronunciation skills. In order to check that the groups are not different from each other and to ensure that the variations due to the treatments and were not affected by extraneous factors, Levene's test of variances was used, p -value = .903 > .05, which means that the populations of the two groups, control and experimental, were not statically different from each other. This test satisfied the ANOVA assumption, which is used in the analysis of result section.

Tools:

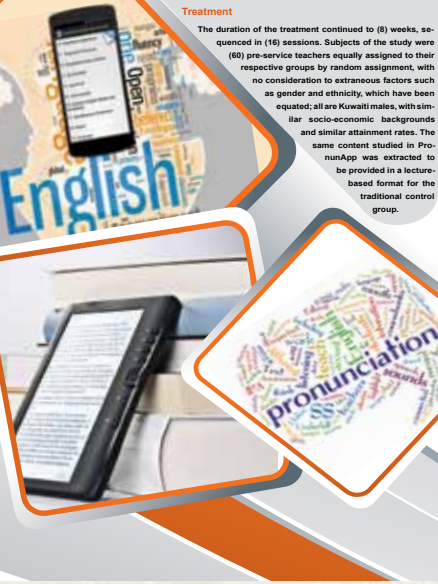
- Pronunciation Multimedia App (PronunApp):**
The programme used is an app about PronunApp, which is designed for beginner to intermediate level students to provide necessary and basic tools to improve English pronunciation skills, manipulating English pronunciation training, listening pronunciation exercises, photos and graphics, practice words and sentences and interactive and exiting pronunciation games. The app was judged by a jury of experts in Kuwait University for validation purposes.

Digital Device (Tablet PC):
Students were allowed to use any tablet they prefer, almost all of them used iPad, one of them used Samsung tab. PronunApp was available in both Apple and Android systems. The students were asked to download the app on their devices at the beginning of the study.

Instruments:

- Scale of Attitudes towards Tablets Instruction (SATI):**
The scale consists of 24-item instrument that assesses students' views towards tablets technology when this is used for educational purposes. Five dimensions of SATI were included: students' views towards computer interaction (INTERACT); students' degree of involvement in the tablet PC activity (INVOLVE); students' views on individualized instruction (INDIVIDU); students' perceptions toward self-paced instruction (SELF-PAC); students' level of anxiety when working with tablet PC (WDXN). Each item was answered on a 5-point Likert scale. A jury of experts in educational technology in Kuwait University validated the SATI and it was pilot-studied for reliability. The reliability coefficient of (0.78) was calculated using test-retest method.
- Academic Achievement Test (AAT):**
An achievement test was designed for the purpose of the current study and consisted of (16) multi-choice items. The total possible score of the test was (20) marks. Faculty members for the department of curriculum and teaching methods, face validated the instrument. A pilot study was carried out on (10) students whose major is English teaching and out of the study sample. The reliability of the test was calculated using Alpha Cronbach correlation coefficient and formed to be equal to (.87), which indicated a reliable test.

Treatment
The duration of the treatment continued to (8) weeks, sequenced in (16) sessions. Subjects of the study were (60) pre-service teachers equally assigned to their respective groups by random assignment, with no consideration to extraneous factors such as gender and ethnicity, which have been equated; all are Kuwaiti males, with similar socio-economic backgrounds and similar attainment rates. The same content studied in PronunApp was extracted to be provided in a lecture-based format for the traditional control group.



Results

After collecting and tabulating the data into an SPSS software, a descriptive statistics has been executed. Figure (1) describes the sample of the study.



Figure (1) : Mean and Standard Deviations for the Experimental and the Control Groups across Academic Achievement and Attitude

From figure (1), the experimental group, which consisted of (60) participants, had higher mean scores than the control group, which consisted of (60) participants, on academic achievement as well as attitude. In addition, the control group had higher standard deviation than the experimental group in both academic achievement and attitude. This study sought to investigate the effects of tablet PC-based instruction on pre-service teachers' pronunciation skills and their attitudes towards pronunciation in a tablet PC-based environment. The type of data in this study is post-test facts. The experiment was commenced and in the end, the instruments were administered to the subjects in the experimental and control groups.

In answering the research question "Are there any significant differences exist between pre-service teachers' academic achievement in English pronunciation who used tablet PC compared to their counterparts who did not?", the following table shows the results produced by an achievement test for both groups on post testing manipulating an ANOVA test.

Comparison Aspects	Df	SS	MS	F	Sig.
Between Groups	1	13.23	13.23	23.42***	.001
Within Groups	69	237.35	0.51		
Total	60	250.58			

Figure (2) : Analysis of Variance for mean differences between the treatment group and the control group

The results from the table above indicate that there is a positive mean difference between the treatment group and the control group in the development of their pronunciation skills. A tablet PC-based pronunciation training software outperformed the control group with statistically significant differences ($p < .001$).

As shown in figure (2), the ANOVA test for the differences between treatment and control group mean scores on the performance test demonstrates the means for the experimental group mean, meeting the level of statistical significance where $F = 23.42$, $p < .001$, hence a positive mean difference found in favour of the tablet PC-based instruction in pronunciation.

In regard to the research question "Are there any significant differences exist between pre-service teachers' attitude towards English pronunciation who used tablet PC compared to their counterparts who did not?", the attitude towards pronunciation development tablet PC software were also investigated. Using data from SATI, the following table sums up the results:

Comparison Aspects	Df	SS	MS	F	Sig.
Between Groups	1	20.22	20.24	20.00***	.001
Within Groups	69	405.76	1.32		
Total	60	525.95			

Figure (3) : Analysis of Variance for mean differences between the treatment group and the control group on attitudes

The scale used for measuring attitudes towards the tablet-PC software in pronunciation (Pronunciation P1), SATI, served to give insights into the specific benefits of the treatment programs. The table gives testimony supporting the notion that tablet PC-based instruction have positive effects on the students' attitudes towards the English Pronunciation P1 means and its use in the instructional designs on all five dimensions of the scale. As shown in figure (3), the mean for the treatment performance was 20.24, while the control group produced a 1.32. The variance meets the standard for statistical significance where $F = 20.00$, $p < .0001$, thus producing positive results as to the effects of the treatment tablet PC-based delivery pronunciation programme.

Discussion

As anticipated, there were statistically significant differences in gain scores between pre-service teachers' from tablet PC-based instruction group and comparison group. Statistical tests indicated that project and comparison pre-service teachers' base performance scores and attitudes scores. However, the researchers' observations together with performance assessment data, and attitudes scale data provide the three sources of evidence that the tablet PC-based instruction in pronunciation is successful in helping students learn the "new basics" and pronunciation skills necessary for the development of good listening and speaking skills in English that are at the core of the English department's vision for students. Participant observation had that students are more motivated, involved, interactive in class and engaged in classroom activities.

They also save students taking greater responsibility for their own learning and collaborating more effectively with their peers. The performance assessment showed that students' listening and speaking skills were significantly greater than the matched comparison group and that there was a trend towards higher scores in content mastery as well as on individual pronunciation skill areas.

The use of tablet PC software with varying activities in aural-oral input production and reception helped in providing more paced, individualized drill and practice. This is consistent with what (Anderson, 2005; Betchamber, 2007; Richards, 2006) propose as a framework that supports a communicative-cognitive approach to teaching pronunciation. As digital media are used, students typically spend more time reviewing and revising the content of their learning lessons and develop a greater manipulation of their aural-oral skills. As well, using a software that establishes aural-oral communication goals and objectives that identify pronunciation needs as well as speech functions and the contexts in which they might occur (Piriz & Calderon 2006; Mang & Wardley, 2012) is much helpful considering individualized, paced instruction, using more drill and practice, and an reproducing recordings of pre-service teachers' voices for self-evaluations.

The activities in aural and oral training in the tablet PC software manipulated realistic segments and pieces of real life discourse aiming for functional intelligibility, functional communicability, and enhanced self-confidence in use which have been employed in the training software and in compatibility with previous research on the significance of these training tool (Anderson, Schwager & Kerns, 2006; Chen, 2013; El-Gayar, Moran & Hawkins, 2011; Karasiri & Flavie 2013; Kolla & Singer, 2009). Furthermore, previous research also indicated that the learner's attitude factors play a significant role in pronunciation acquisition (Berone & Bondi, 2012; Kondo, Ishikawa, Smith, Sakamoto, Shimomura & Wada, 2012; Rossing, Miller, et al., 2012). This may explain the relationship between enhanced pronunciation performance and attitudes towards pronunciation teaching in a tablet PC-based learning environment. This is consistent with previous observations in the literature that noncognitive factors related to an individual's personality and learning goals can influence achievement in pronunciation (Mino, Mohammad & Lari, 2012; Rikala, Vessilano & Mylly, 2013).

Conclusions & Recommendations

The tablets instructional experience made a positive difference in the skills and attitudes of pre-service teachers in this study. However, without continual reinforcement of the use of technology, skill level will not be maintained. Yet, time competes with an already overwhelming course load in which students are learning theory, practice, and in pronunciation, phonetics and conversational English.

Insights from the analysis of the results from this study leads to the following recommendations. The courseware empowered by tablet PC-based delivery methods should be placed during the first years of the professional programme for student teachers to allow maximum use of technology during the next years. Once students have taken the courseware, there should be continued emphasis placed on the importance of technology by requiring its use in all method and content courses. This continued practice would help sustain pre-service teachers' knowledge and interest in becoming proficient in using technology in the classroom.

Finally, professors have an influence on students in the English department as they teach best practices in teaching and learning. Therefore, it is imperative that TEFL professors are appropriately trained in the use of technology and be required and equipped to use technology in their daily teaching. This modelling will help keep technology in the forefront of the students learning experience.



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واقع التدريب الانتظامي لتنمية الكفايات التدريسية والتقييمية لدى معلم المعلم في ضوء معيار "التدريس" لجمعية معلمي المعلم (ATE)

د. علي أسماعيل الهولي

قسم المناهج وطرق التدريس - كلية التربية

نتائج سؤال الدراسة الأول

رقم السؤال	الخيار	النسبة المئوية	الترتيب	الفرق النسبي	الفرق المطلق	الفرق النسبي	الفرق المطلق
1	أ	56.8	47	35.7	30	8.3	7
2	ب	57.9	57	23.8	20	8.3	7
3	ج	77.4	60	12.4	19	0	0
4	د	85.7	72	11.8	10	3.4	2
5	هـ	84.1	54	38.4	24	7.1	6
6	و	94.8	40	19.7	30	8.3	8
7	ز	89.6	58	34.7	29	3.6	3
8	ح	87.7	57	30.1	17	11.9	10
9	ط	89.3	50	34.3	29	6.0	5
10	ي	85.1	40	39.2	33	6.0	5
11	ك	85.7	72	10.7	9	3.6	3
12	ل	76.7	64	17.9	15	6.0	5
13	م	73.4	60	15.8	21	3.6	3
14	ن	75.9	63	17.4	18	3.6	3
15	س	84.8	40	36.9	31	8.3	7

نتائج سؤال الدراسة الثاني

رقم السؤال	الخيار	النسبة المئوية	الترتيب	الفرق النسبي	الفرق المطلق	الفرق النسبي	الفرق المطلق
1	أ	58.9	49	35.7	30	6.0	5
2	ب	71.4	60	26.2	22	2.4	2
3	ج	85.6	54	26.2	22	4.8	4
4	د	77.4	63	30.0	17	2.4	2
5	هـ	82.2	64	25.4	18	1.2	1
6	و	75.0	61	16.7	14	8.3	7

أهم التوصيات:

1. إنشاء مركز مختص بتطوير كفايات التدريس وكفايات التقييم لدى معلمي المعلم، والاستفادة من خبرات المراكز العالمية المماثلة.
2. تبني معايير جمعية معلمي المعلم الدولية (ATE) ووضع التطبيقات لها وخاصة المتعلقة بمعايير التدريس ومؤشراته.
3. تبني كلية التربية برنامجاً واضحاً ومعلناً للتدريب الانتظامي لمعلمي المعلم لديها.
4. ربط نظام ترقية معلم المعلم بما يحمله ويطبق من كفايات تدريسية وتقييمية.

ملخص: هدفت هذه الدراسة إلى التعرف على مدى تقديم كلية التربية في جامعة الكويت للفرص التدريبية الانتظامية لأعضاء هيئة التدريس (معلمي المعلم) المنتسبين إليها وذلك في مجال الكفايات التدريسية والتقييمية. تم تصميم استبانة مكونة من (21) بنداً تعكس الكفايات التدريسية والتقييمية التي جاءت في الإطار المفاهيمي لكلية التربية في جامعة الكويت وما يتوافق معها من مؤشرات لمعيار التدريس لجمعية معلمي المعلم (ATE). شارك في الدراسة جميع معلمي المعلم في كلية التربية المتواجدين فعلياً على رأس عملهم (عدد 84). تم تحليل نتائج الدراسة باستخدام الإحصاء الوصفي واختبار تحليل التباين الأحادي (ANOVA) وذلك لإيجاد الفروق بين المجموعات المختلفة. أشارت نتائج الدراسة إلى أن غالبية معلمي المعلم في كلية التربية في جامعة الكويت يرون بأن كلية التربية لا تقدم لهم فرصاً تدريبية انتظامية في مجال الكفايات التدريسية والتقييمية. لم تتوصل نتائج الدراسة إلى فروق دالة إحصائية في متوسط آراء معلمي المعلم حول مدى تقديم كلية التربية للفرص التدريبية الانتظامية لهم تبعاً لمتغيرات سنوات الخبرة التدريسية، القسم العلمي، والرتبة الأكاديمية. تمت مناقشة نتائج الدراسة في ضوء الأدبيات، وقدم الباحث عدداً من التوصيات.

مقدمة وإحساس بالمشكلة:

تقاس كفاءة أي مؤسسة تعليمية بكفاءة هيئتها التدريسية وما تملكه هذه الهيئة من معارف ومهارات واتجاهات. وتحرص العديد من مؤسسات التعليم العالي على تطوير وتحديث برامجها التعليمية، وتستثمر جهودها أيضاً في تطوير مبانيها وأجهزتها وأدواتها ومناهجها والنظام الإداري فيها. إلا أن هذا التحديث والتطوير قد لا يصاحبه بصورة متوازنة اهتمام تلك المؤسسات بتطوير وتنمية قدرات الهيئة التدريسية فيها، وذلك انطلاقاً من إيمان القائمين على تلك المؤسسات بمسئولية أن عضو هيئة التدريس في مؤسسة التعليم العالي على درجة عالية من الكفاءة العلمية التي تؤهله للقيام بدوره المطلوب. غير أن الواقع يحتم علينا ألا نقبل بهذه المسئولية بصورة آلية؛ فالتغيير في طبيعة العملية التعليمية وطبيعة المتعلمين، إلى جانب التغيير المتسارع في الظروف الاجتماعية والتقنية والتعليمية، يتطلب قيام الهيئة التدريسية في تلك المؤسسات بأدوار مستحدثة. وينادي المفكرون في هذا المجال بأهمية تزويد الهيئة التدريسية في تلك المؤسسات بكفايات تدريسية وتقييمية متنوعة وفعالة تؤدي إلى تحقيق التعلم الأفضل كما وكيفا (Keeling & Hersh, 2011).

بعض التعريفات الإجرائية:

الفرص التدريبية الانتظامية: هي مواقف مخططة ومنظمة ومتاحة لمعلم المعلم لاكتساب أو تنمية معرفة أو مهارة أو اتجاه. **كفاية التدريس وفق النظرية البنائية:** هي معارف ومهارات واتجاهات يمتلكها معلم المعلم ليساعد متعلميه على الاستقصاء وبناء المعاني بدلاً من تلقينهم للمعلومات فقط، وييسر لهم كذلك إدراك أن المعرفة هي المعنى الذي يكونونه بصورة نشطة من خبرتهم ومن منظورهم السابق ومن تفاعلهم مع العالم حولهم، ويديروهم لبيئنا لأنفسهم مفاهيم من أجل أن يصلوا إلى الفهم العميق للمعرفة. **كفاية تدريس طريقة الحالة:** هي معارف ومهارات واتجاهات يمتلكها معلم المعلم مرتبطة باستخدامه لنهج استقرائي للتعلم متمثل في قيام متعلميه بقراءة موقف أو حدث أو مشكلة تفصيلية (حالة) ومن ثم قيامهم بصورة جماعية أو بصورة مجموعات بمناقشتها وتحليلها للوصول إلى حلول أو تكوين فهم أعمق لمجال تطبيقي معين تحت إشرافه.

أسئلة الدراسة:

ما مدى تقديم كلية التربية للفرص التدريبية الانتظامية المتعلقة بالكفايات التدريسية (السؤال الأول) والتقييمية (السؤال الثاني) لمعلمي المعلم فيها وذلك من وجهة نظرهم؟ وهل يختلف معلمو المعلم في تحديد مدى تقديم كلية التربية للفرص التدريبية الانتظامية لهم في مجال الكفايات التدريسية والتقييمية باختلاف متغيرات الخبرة التدريسية، والقسم العلمي، والرتبة الأكاديمية؟ (السؤال الثالث).

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فاعلية برنامج قائم على تعلم الرياضيات باللمس في تحسين المستوى التحصيلي لذوي صعوبات التعلم في الرياضيات



Effectiveness of A Teaching Program Touch Math to Improve the Achievement Level of Students with Learning Difficulties in Maths

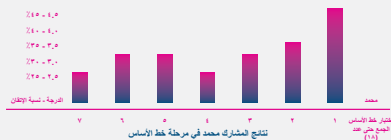


مقدمة من: أ.إيمان فاضل عبدالله العرادي إشراف: د.أ. نهى راشد الرويشد

برنامج الماجستير في التربية الموحدة | مسار المناهج وطرق التدريس

مارس ٢٠١٥

تلخيصاً: نتائج المشارك محمد بدأت تتخفف عند تطبيق إختبارات خط الأساس حيث كان متوسط نتاجه في إختبارات خط الأساس السبعة (م = ٢١.٤) بينما كان المدى يتراوح (المدى=٢٥-١٥) ، ولكن نتاجه بدأت بالارتفاع بشكل ملحوظ في مرحلة التدخل عند تطبيق البرنامج التدريسي القائم على تعلم الرياضيات باللمس حيث كان متوسط نتاجه في إختبارات مرحلة التدخل المكونة من أربعة عشر إختبار (م = ٢٨.٧) بينما كان المدى يتراوح (المدى=٢١-٢٥) ، وبعد خمس جلسات من انتهاء مرحلة التدخل تم تطبيق إختبار (لمضاعفة التدخل) لتلك من ثبات المستوى عند المشارك حيث حصل فيه على نسبة ٢٥٪.



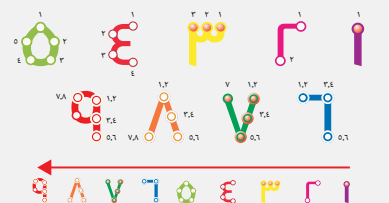
تلخيصاً: نتائج المشارك الوليد بدأت تتخفف عند تطبيق إختبارات خط الأساس حيث كان متوسط نتاجه في إختبارات خط الأساس العشر (م = ٢٨) بينما كان المدى يتراوح بين (المدى=٢٥-٢٠) ، ولكن نتاجه بدأت بالارتفاع بشكل ملحوظ في مرحلة التدخل عند تطبيق البرنامج التدريسي القائم على تعلم الرياضيات باللمس حيث كان متوسط نتاجه في إختبارات مرحلة التدخل المكونة من أربعة عشر إختبار (م = ٢٨.٥) بينما كان المدى يتراوح (المدى=٢٥-٢١) ، وبعد خمس جلسات من انتهاء مرحلة التدخل تم تطبيق إختبار (لمضاعفة التدخل) لتلك من ثبات المستوى عند المشارك حيث حصل فيه على نسبة ٢٥٪.



نتائج المشاركين في الدراسة في مرحلة خط الأساس و مرحلة التدخل ومضاعفة التدخل

توزيع نقاط اللمس في البرنامج التدريسي

لكل رقم في مناهج رياضيات اللمس رقم منظر له من نقاط اللمس الموضوعية على ذلك الرقم حيث أنه من المهم أن تقوم باستخدام نفس النمط من النقاط للإعداد من ١ إلى ٩. كل نقطة مفردة يجب لمسها وزيارة مرة واحدة بينما يتم لمس النقاط المزدوجة وبعدها مرتين والصفر ليس له نقاط لمس ولا يدر.



خطوات إجراء الدراسة

- إعداد الإختبار التحصيلي والتحقق من مؤشرات صدقه ووثاقه.
- بناء البرنامج التدريسي القائم على تعلم الرياضيات باللمس والتحقق من مؤشرات صدقه.
- زيارة مدرسة السديم النموذجية الابتدائية بين منطقة تكبير الكبريك التعليمية ومقابلة الإدارة لتوضيح أهداف الدراسة.

- مقابلة التلاميذ وتطبيق الإختبار القبلي عليهم ثم فرزهم بناء على نتائجهم بالإختبار القبلي وتم إختيار ٣ تلاميذ الذين حصلوا على أقل درجات إبتكارا عينة الدراسة الرئيسية.
- تطبيق إختبارات خط الأساس المكونة من ٤ إختبارات التي تشمل المفاهيم الواردة في البرنامج التدريسي بشكل فردي على كل تلميذ.
- تم التدخل على المشارك فيد من خلال تطبيق البرنامج بعد ٤ جلسات بينما استمر كل من محمد والوليد في خط الأساس واستمر محمد ٧ جلسات في خط الأساس بينما استمر الوليد ١٠ جلسات بناء على التصميم متجدد الأساس.

- بعد الجلسة السابعة لمحمد تم التدخل في تطبيق البرنامج التدريسي بينما تم التدخل للوليد بعد الجلسة الثامنة بناء على تصميم متجدد الأساس للتوصل أن ارتفاع درجتهم نتيجة التدخل وإين التصميم التعليمية التي تؤثر على الصنق الداخلي.

- تم تطبيق إختبارات مرحلة التدخل بشكل يومي على جميع المشاركين بحيث يحتوي كل إختبار على المفاهيم التي تم تدريسها من خلال تطبيق برنامج تعلم الرياضيات باللمس Touch Math حيث تدرجت الإختبارات بناء على المحسن الدراسية في البداية تكون الإختبارات تحتوي أرقامها على نقط على الأعداد ثم تتدرج بأن يكون الإختبار يحتوي أحد طرفي عملية الجمع على النقط ومن ثم في النهاية يصبح المشارك قادر على حل الإختبار بعبارات جمع لا تحتوي على نقط.
- مقارنة مدة تقدم كل تلميذ قبل وأثناء تطبيق البرنامج التدريسي باستخدام الفحص البصري وحساب النسب المئوية للمشاركين الثلاثة.

- بعد أسبوع من انتهاء مرحلة التدخل يطبق إختبار (لمضاعفة التدخل) على كل مشارك بحيث لا تحتوي عبارات الجمع فيه على نقط لتأكيد إستمرار المشارك على المستوى الذي أحرزه.

الأساليب الإحصائية المستخدمة

تستخدم الدراسة الحالية الأساليب الإحصائية التالية:
• المتوسطات الحسابية والإحاراف المعيارية والنسب المئوية: للتعرف على متوسط درجات كل تلميذ على الإختبار التحصيلي في الرياضيات قبل وأثناء تطبيق البرنامج التدريسي.
• استخدام الفحص البصري Visual inspection في تحليل نتائج المشاركين في الدراسة بشكل إفرادي.

نتائج الدراسة

- فاعلية برنامج قائم على تعلم الرياضيات باللمس لتحسين المستوى التحصيلي لذوي صعوبات التعلم في الرياضيات حيث تبين وجود تحسن ملحوظ في مرحلة التدخل عند تطبيق البرنامج التدريسي القائم على تعلم الرياضيات باللمس حيث كان متوسط نتاجه في إختبارات خط الأساس السبعة (م = ٢١.٤) بينما كان المدى يتراوح (المدى=٢٥-١٥) ، ولكن نتاجه بدأت بالارتفاع بشكل ملحوظ في مرحلة التدخل عند تطبيق البرنامج التدريسي القائم على تعلم الرياضيات باللمس حيث كان متوسط نتاجه في إختبارات مرحلة التدخل المكونة من أربعة عشر إختبار (م = ٢٨.٧) بينما كان المدى يتراوح (المدى=٢١-٢٥) ، وبعد خمس جلسات من انتهاء مرحلة التدخل تم تطبيق إختبار (لمضاعفة التدخل) لتلك من ثبات المستوى عند المشارك حيث حصل فيه على نسبة ٢٥٪.

- أولاً: نتائج المشارك فيد بدأت تتخفف عند تطبيق إختبارات خط الأساس حيث كان متوسط نتاجه في إختبارات خط الأساس الأربعة (م = ٢١.٥) بينما كان المدى يتراوح (المدى=٢٥-١٥) ، ولكن نتاجه بدأت بالارتفاع بشكل ملحوظ في مرحلة التدخل عند تطبيق البرنامج التدريسي القائم على تعلم الرياضيات باللمس حيث كان متوسط نتاجه في إختبارات مرحلة التدخل المكونة من أربعة عشر إختبار (م = ٢٨.٧) بينما كان المدى يتراوح (المدى=٢١-٢٥) ، وبعد خمس جلسات من انتهاء مرحلة التدخل تم تطبيق إختبار (لمضاعفة التدخل) لتلك من ثبات المستوى عند المشارك حيث حصل فيه على نسبة ٢٥٪.



ملخص الدراسة

تهافت هذه الدراسة إلى إختيار فاعلية برنامج قائم على تعلم الرياضيات باللمس Touch Math على الصف الثالث الابتدائي ذوي صعوبات التعلم في مادة الرياضيات. إختبرت إكتساب تلاميذ المرحلة الابتدائية - الصف الثالث - المفاهيم الحسابية الأساسية لعملية الجمع، إختبرت حالات الدراسة من التلاميذ المشخصين بصعوبات التعلم في مادة الرياضيات من مدرسة السديم الإبتدائية للبنين، وتكون عدد المشاركين في التجربة من (٣) تلاميذ تم تشخيصهم على أنهم من ذوي صعوبات تعلم الرياضيات بعد تطبيق إختبار وكسل لكثافة الأطفال عليهم، وإختيار التحصيل في الرياضيات. تم تطبيق البرنامج العلاجي الإختبار التربوي من خلال تصميم الحالة الواحدة ذو الخطوات القاعدية المتعددة عبر الحالات Multiple-Basein Design ، أظهرت النتائج فاعلية البرنامج القائم على تعلم الرياضيات باللمس في تنمية قدرات التلاميذ في المفاهيم الحسابية الأساسية لعملية الجمع بنتائج لا يزيد عن ١٨٪، حيث تبين وجود تحسن ملحوظ في أداء التلاميذ، حيث تراوحت نسب إتقانهم قبل تطبيق البرنامج التدريسي ما بين (٢٠٪) إلى (٤٥٪) ، وترافقت مع نهاية البرنامج التدريسي إلى ما بين (٢٥٪) إلى (٦٠٪).

أهداف الدراسة

١- إختيار فاعلية البرنامج القائم على تعلم الرياضيات باللمس في تحسين المستوى التحصيلي لتلاميذ الصف الثالث الابتدائي ذوي صعوبات التعلم في مادة الرياضيات .
٢- إعداد برنامج تدريسي لتحسين المستوى التحصيلي لتلاميذ ذوي صعوبات التعلم في مادة الرياضيات بطريقة تطبيقية تعلم الرياضيات باللمس.

منهجية الدراسة

تتبع الدراسة الحالية المنهج التجريبي، حيث تسعى للتعرف على فاعلية البرنامج التدريسي، وتتعدّد الدراسة الحالية على تصميم الحالة الواحدة ذو الخطوات القاعدية المتعددة عبر الحالات Multiple Design ، Basein ، حيث يتم فيها دراسة الحالة الواحدة بدلاً من المجموعة ولتبات أن التغيير الملحوظ في مستوى الحالة يكون نتيجة مرحلة التدخل، ويقوم هذا المنهج على تحديد مستوى كل تلميذ على حدة قبل تطبيق البرنامج التدريسي، ثم دراسة مستوى تقدم كل تلميذ خلال البرنامج التدريسي بشكل دوري، حيث يتم إحصاء الحالة لقياسات متعددة قبل وأثناء تطبيق البرنامج العلاجي وهذا يساعد على إثبات أن التحسن الذي حصل للمشاركين في الدراسة نتيجة للتدخل وليس جراء عامل الصدفة.

عينة الدراسة

تكونت عينة الدراسة من (٣) تلاميذ مشاركون من مدرسة السديم النموذجية الإبتدائية بين منطقة تكبير الكبريك التعليمية وإختبرهم من جميع تلاميذ الصف الثالث في المدرسة المشخصين على أنهم من ذوي صعوبات تعلم الرياضيات وعددهم (١٨) تلميذاً من خلال تطبيق الإختبار التحصيلي في الرياضيات عليهم، حيث تم إختيار أقل (٣) تلاميذ تحصيلياً لإبتكارا أفراد المجموعة التحصيلية.

الرقم	التسمية	الصف	العمر	درجة التكافؤ	المستوى التحصيلي	المشكلات الاسرية
١	التلميذ ١ (وليد)	الثالث الإبتدائي	٨ سنوات	١.٣	متنازل	لا يوجد
٢	التلميذ ١ (محمد)	الثالث الإبتدائي	٨ سنوات	١.٢	متنازل	لا يوجد
٣	التلميذ ١ (الوليد)	الثالث الإبتدائي	٨ سنوات	٩٧	متوسط	لا يوجد

أدوات الدراسة

أولاً: الإختبار التحصيلي في الرياضيات قامت الباحثة بإعداد الإختبار الذي يقاس مستوى التلاميذ في المهارات الأساسية في الرياضيات الصف الثالث الإبتدائي يتكون من (٤٠) مسألة، حيث يتكون الإختبار من أربعة إختبارات فرعية كل إختبار يتكون من (١٠) مسائل في جمع عددين لا يزيدان عنهما ١٨ وقامت الباحثة بالتحقق من مؤشرات صدقه ووثاقه.

ثانياً: إختبار وكسل لكثافة الأطفال تم تطبيق مقياس وكسل لكثافة الأطفال على المشاركين في الدراسة ولتفك المقياس في صورته الأصلية من إثني عشر مقياساً فرعياً (عشرة منها في التطبيق العادي وإثنان يستعملون كإختبارات إجتماعية) وقد صنف في مجموعتين المقياس التلقائية والإختبارات الأدائية.

ثالثاً: البرنامج التدريسي أعدت الباحثة البرنامج التدريسي القائم على طريقة تدريس الرياضيات باللمس Touch Math على عينة الجمع وتم تعريبه بما يتواءم أهداف الدراسة بعد أخذ الموافقة من المؤسسة القائمة على إعداد البرنامج Touch Math .
- المنطلق النظرية البرنامج التدريسي: تم إعداد البرنامج ضمن التصميم العالمي للتعلم Universal Design for Learning لإتلاء لتمام جميع الفئات وطبق في المرحلة الثانية من الإستجابة للتدخل Response to Intervention للتلاميذ ذوي صعوبات التعلم لمدة الرياضيات وهم في مرحلة خطر من الفشل الدراسي ويهدف التدخل لمنع الفشل الأكاديمي لهؤلاء التلاميذ.

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Mind Maps as Facilitative Tools in Science Education



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ABSTRACT This study explored the perceptions and attitudes of pre-service science teachers in the COE at KU about using concept/mind maps and its related apps as facilitative tools, for teaching and learning, in science education. The findings disclose that 74.2 percent of participants asserted being aware about concept/mind maps beforehand. However, the vast majority, 93.8 percent, affirmed that they are not aware about concept/mind mapping apps. The results also indicate that all participants were highly satisfied with utilizing concept/mind mapping apps in education; accordingly, their reaction-based satisfaction level was extremely positive and significantly high among all subgroups. The participants favored utilizing such tools for constructing their concept/mind maps over hand-drawing or regular desktop productivity apps. They also do believe that these tools are important constituents for promoting thrive and success in science education.

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INTRODUCTION ICT has become a vital aspect of our world in various domains, including education. Concept/mind mapping apps have been recognized broadly to be very effective ICT tool in education for learners of all ages and in all subject areas, including science education. These apps can be utilized to deliver a distinctive visual display of how learners generate, categorize, arrange, associate, and synthesize information in order to construct on their existing knowledge. The apps also heighten motivation and inspire critical thinking and visual learning, as well as promote innovation and creativity. This kind of applications has the potential to create the keystone for solid and meaningful lifelong learning opportunities.

OBJECTIVE The study's objective was to explore the perceptions, attitudes, and willingness of pre-service science teachers in the COE at KU about using concept/mind maps and its related apps as facilitative tools, for teaching and learning, in science education.

RESEARCH QUESTIONS

1. Are pre-service science teachers at KU aware about concept/mind maps and its related apps?
2. Do KU's pre-service science teachers utilize concept/mind maps and its related apps as

3. Are KU's pre-service science teachers satisfied with concept/mind maps and its related tools?
4. What are the complications associated with using concept/mind maps and its related apps?
5. Do KU's pre-service science teachers believe that concept/mind maps and its related tools are useful ingredients for success in education?
6. How KU's pre-service science teachers feel about their experience with concept/mind maps and its related apps as facilitative tools in science education?

SIGNIFICANCE Since 1977, when Joseph Novak published his educational theory underlying concept maps and how to construct and use them in education as a teaching, learning, and measurement tool, many research studies were conducted. These studies have recognized the significance of concept/mind maps and its related apps in enhancing education, generally, and for stimulating and improving science education specifically. However, after searching, retrieving, and reviewing literature for this study, the researchers found no evidence of such studies in AGCC and Middle East focusing on this topic neither in PK-12 education nor in higher education. The research presents the decision makers with empirical evidences that either sustain or challenge the application and integration of concept/mind maps and its related apps as facilitative tools in education.

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METHODOLOGY

Research Design A descriptive research design was used. In fact, the first level (i.e., reaction) of Kirkpatrick's/Phillips' classic 5-level evaluation research model was exploited to assess and validate the reaction-based satisfaction level of COE's pre-service science teachers regarding the utilization and integration of concept/mind maps and its related apps as facilitative tools for promoting science education.

Sample 31 female junior and senior undergraduate students from the COE at KU enrolled in one section of an undergraduate 300-level course entitled "Elementary Science Teaching Methods 0840-323" for the Fall semester of 2011-2012 academic year were requested to take part in this study. The sample represented various ethnic and academic backgrounds. The academic course is a compulsory requirement for the professional preparation of all pre-service elementary science teachers in the COE. The course is a 3-credit class taught the same subject content by the same instructor, using the same delivery method for instruction, traditional instructor-led face-to-face.

Data Collection The researchers introduced concept/mind maps to the participants at the middle of the Fall semester of 2011-2012. Each pre-service science teacher was

asked to select a topic from Kuwait's governmental science education curriculum in order to construct a supplementary hand-made concept/mind map related to that topic. Later on, the researchers encouraged the participants to utilize and integrate ICT tools in the formation process of their concept/mind maps, without endorsing any particular type of desktop productivity apps. Afterward, the researchers elaborated in their presentation to include detailed information about concept/mind mapping apps. The pre-service teachers were trained on utilizing and integrating one of the well-known concept/mind mapping apps. Again, they were asked by the researchers to use the app in the creation process of their maps. At the end of the deployment period, which took two months, the pre-service science teachers were asked to complete the Likert scale survey. Additional qualitative mode of inquiry (i.e., informal observations) was also used.

Methods of Analysis Various methods of analysis were used to scrutinize the data. The descriptive analysis measures applied were frequency, percentage, mean, and standard deviation. The inferential statistics procedures utilized, in order to scan for differences among the research's questions and other factor variables (e.g., GPA, university grade level, type of ICT user, and type of learner), were ANOVA, Dunnett's C multiple comparisons test, Scheffe's multiple comparisons test, and independent-samples t-test.

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RESULTS

RQ.1 - Awareness %74.2 of participants asserted being aware about concept/mind maps before taking the academic course ($M = 3.68$, and $SD = 1.326$). However, the vast majority, %96.8, acknowledged that they are not aware about concept/mind mapping apps ($M = 1.65$, and $SD = 0.551$). The results of the inferential tests disclose no significant differences among the subgroups with respect to "GPA", "University Grade Level", and "Type of ICT User". Nevertheless, pre-service science teachers' responses to RQ-1 show significant differences among all subgroups with respect to "Type of Learner", $t(25.437) = 2.703$, $p < 0.05$, ($p = 0.012$).

RQ.2 - Utilization %87.1 of participants affirmed that they have just started using concept/mind maps ($M = 4.06$, and $SD = 1.031$) and regular desktop apps ($M = 3.97$, and $SD = 1.169$) in order to construct these maps during the academic course. All participants agreed that they have just started utilizing concept/mind mapping apps ($M = 4.61$, and $SD = 0.495$). No significant differences among the subgroups were revealed.

RQ.3 - Satisfaction All participants acknowledged that they were satisfied with using concept/mind maps and its related apps. However, the vast majority of them were

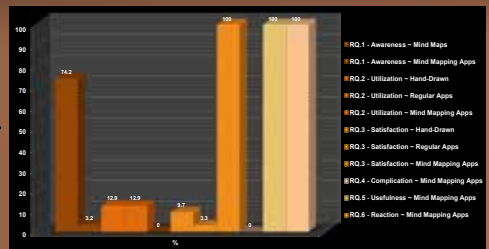
not satisfied with neither creating hand-drawn maps (%90.3, $M = 1.87$, and $SD = 0.562$) nor constructing their mind maps using regular desktop apps (% 96.7, $M = 1.87$, and $SD = 0.428$). No significant differences among the subgroups were discovered.

RQ.4 - Complication All participants acknowledged that using concept/mind mapping apps for creating their mind maps was the easiest and most effective method ($M = 4.74$, and $SD = 0.445$), even though the majority of these specialized applications do not fully support Arabic language. Also, the participants affirmed that utilizing non-specialized ICT tools is much more difficult than hand-drawing. No significant differences among the subgroups were found.

RQ.5 - Usefulness All participants conceded ($M = 4.47$, and $SD = 0.319$) that mind maps and its related apps are useful and valuable facilitative and enhancement tools for promoting thrive and success in education. No significant differences among the subgroups were disclosed.

RQ.6 - Reaction The reaction-based satisfaction level for all participants is significantly high with respect to their experience with concept/mind maps and its related apps ($M = 4.49$, and $SD = 0.271$). No significant differences among the subgroups were observed.

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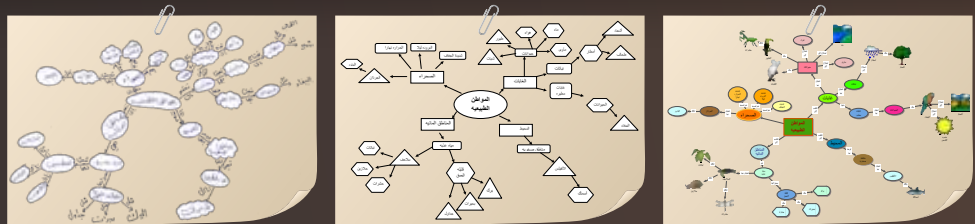


CONCLUSION Accordingly, the findings of this research delineate that there is sufficient demand for introducing and using concept/mind maps and its related application software as facilitative and enhancement tools in education at KU, specifically, and other higher education institutions, generally, as well as in Kuwait's PK-12 education.

RECOMMENDATIONS

1. Teachers need to discover a different approach of looking at their pupils. They are encouraged to facilitate student-centered UDL environments.
2. A thorough teacher introduction, training, & support for using mind mapping apps is required.
3. Administrative-level commitment to mind mapping can be powerful sources of support.
4. Creating an online virtual community where teachers and students are able to communicate, cooperate, and attain support from each other as well as from other educators.
5. More emphasis should be given to other factors affecting the usefulness of mind maps and its apps as facilitative and learning enhancement tools such as: disability, grade level, point of implementation, instructional context, and ease of implementation.
6. Promoting open-ended activities for constructing mind maps are preferable.

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The Analysis of Social Studies and English Language Textbooks for the Intermediate School stage in the light of the Concepts and Values of Citizenship Education

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This study aims to identifying the values and concepts of citizenship in the textbooks of social studies and English textbooks in the intermediate stage at State of Kuwait. The (30) values and concepts of Citizenship were designed and applied on contents of sixth grade to ninth grade social studies and English language textbooks. The content analysis was used to determine the existence of citizenship values and concepts in those books. Findings indicate that the citizenship concepts and values in social studies textbooks superior to the English language textbooks in terms of attention to the following values and concepts of Citizenship (Affiliation - Cooperation - Justice and Equality - Security - maintaining public property). On the other hand it was observed the superiority of the English language textbooks contents on social studies textbooks contents in terms of loyalty, identity, commitment, respect for law and order, the rights and obligations. More so, the both of social studies and English language curriculums were unified in the neglecting the public freedoms, social solidarity, shura and democracy, altruism& sacrifice, tolerance, respect the opinions of others, charity, protection of the Constitution, defending the homeland, interdependence & solidarity and common history & culture. The study recommends the reformulation of social studies& English language curriculums of intermediate stage with a greater focus on the values and concepts of Citizenship, and to have series of research studies to analysis the contents of various curriculums at levels of education; in order to assured the consistent of them with the needed values and concepts of Citizenship.

Keywords: citizenship, social studies & English language textbooks, middle school stage, affiliation, cooperation, justice, equality, loyalty, identity.

Introduction

Citizenship is one of the subjects that drew attention of sociologists and decision makers, politicians and educators around the world. Challenges of 21st century could not be neglected by the world, in general, and the Arab world, in particular. The word "Citizenship" connotes a wide range of concepts and values learned from society, school, family, and society as a whole. Education is entrusted with paying attention to promoting affiliation, national pride, plant citizenship and patriotism, defining rights and obligations for youth, care to practice such rights since childhood so citizenship and patriotism became solid and part of individual's personality and education, Thus education must be deliberate and purposeful under the supervisions of the government from kindergarten until University education via integrating Citizenship principles in curriculums. Thus an individual will become responsible adult in his society in the future (Al-Maamari, 2009)

Purpose of study

In light of study problem and questions, the current study aims to analyze Social Studies and English language textbooks of the Intermediate School Stage in the State of Kuwait in order to identify the number of Citizenship values and concepts taught in these textbooks. Considering the importance of values and concepts in enhancing Citizenship of students, this study will look for the deficiency or negligence of some values and concepts regarding its appearance in these textbooks. More definitely the studies aim at the following: Objectives :

To identify Citizenship values and concepts in Social Studies and English Language textbooks of the Intermediate Schools in the State of Kuwait.

To identify Citizenship values and concepts those are not mentioned in Social Studies and English Language textbook.

To give suggestions and solutions to increase the amount of Citizenship values and concepts in Social Studies and English language textbooks in the intermediate stage.

methodology

Following the review of previous literatures and studies related to Citizenship values and concepts, 30 values and concept were identified and set in a table including all these items, repetition, ratio and categorization of such words according to its indication at Intermediate school textbooks. Table No. (1) Indicate such values and concepts.

Table 1.Values and Concepts of Citizenship

#	Value or Concept	#	Value or Concept
1	Affiliation	16	Arabic Language
2	Loyalty	17	Respect the Opinions of others
3	Identity	18	Charity
4	Commitment	19	Protecting the Constitution
5	Social solidarity	20	Public Interest
6	Rights and Obligations	21	Respect Law and Order
7	Public Freedoms	22	Defending Homeland
8	Shurra and Democracy	23	Maintaining Public Properties
9	Justice and Equality	24	Active Social Participation
10	Citizenship and Patriotism	25	Responsibility
11	Cooperation	26	Appreciating Community Efforts
12	Altruism and Sacrifice	27	National Pride
13	Tolerance	28	Independence and Liberation
14	Security and Stability	29	Interdependence and Social Solidarity
15	Islamic Creed	30	History and Common Culture

Results

The concepts most frequently mentioned in social studies texts were cooperation and the Islamic creed while the concepts most often referenced in the English language texts were loyalty, identity, social solidarity, and rights and obligations. These findings deal with similar to the results of previous literature (Al Khayat, 1999; De la Caba and Alxurra, 2006; Faryha, 2004; Mubarak, 1994; Shanzaga, 2011) that found a concentration on social citizenship and cooperation.

Many concepts of citizenship are clearly neglected in the intermediate school social studies and English language textbooks that's due to the curriculum committees in the ministry of Education who decided that these values are enough and most urgent to be included in these books, may be because of not seeing the future change of events and the important values needed like volunteering in social and political campaigns.

The frequencies and percentages in the previous tables show a shortage of interest in a number of concepts of citizenship, in spite of its importance for students and their future. All agree that there is a lack of focus on citizenship values that students need to learn through the curriculum of basic subjects such as social studies and English language. The researchers would like to point out that although there are few concepts in the textbooks it is up to the teachers to emphasize on the important concepts either it's the lack of knowledge or the lack of time in class .

Conclusion

In light of the results of the study the percentage of values and concepts essential to create good citizen like Affiliation, identity, commitment, rights , and duties that reveal in the English language subject. Public freedoms, We would like to add as researchers that curriculum supervisors should emphasize on values by including the curriculum some special activities related to it with practical experiences help for solidarity in social work which will reflect on the students' personalities and add to their experiences.

democracy, justice & equality, citizenship and patriotism, tolerance, security and etc., are important values of our youths, they should be educate and coach to practice these values in the streets, by respecting the policeman, in order minimize crime rate and violence in the city. All of these will shape a better future for our country. As researchers believed that these textbooks needs urgent revision or replacement with new more practical modern textbooks to suit the changes of events and needs of the Kuwaiti community in putting in mind the changes of the Arabic spring, and how can we cop with these huge changes in our region with this in mind and after reviewing the findings, it is recommended the modification of both social studies and English language textbooks at the intermediate level to emphasize important concepts of citizenship like loyalty, identity, commitment, social solidarity, public freedoms, democracy, and altruism, respecting other's opinions, respecting law and order, maintaining the Constitution, and defending the homeland.

Conducting further research to verify the degree of concern about the concepts of citizenship in the curriculum at the primary and intermediate level.

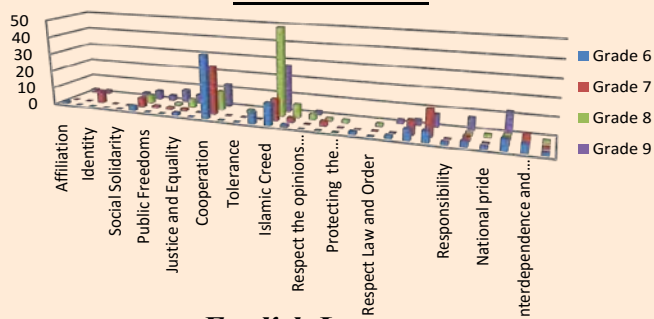
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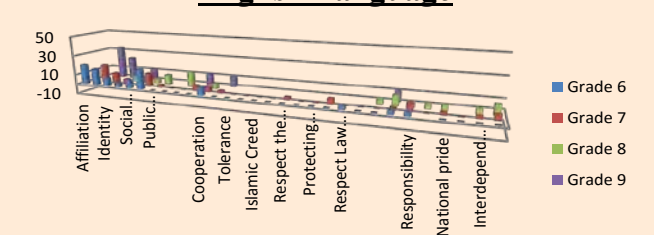
Statistical Analysis

SPSS program used to conduct appropriate statistical analysis and processed statistically.

Social Studies



English Language





أدب الأطفال ودوره في حل مشكلات معلمات رياض الأطفال في تدريس الموضوعات العلمية: موضوع (المادة) كنموذج

رسالة ماجستير في التربية الموحدة مسار المناهج وطرق التدريس يونيو 2013

بإشراف: د. علي عاشور الجعفر

مقدمة من: أ. بتول عبدالله تقي

المخلص

اعتمدت الدراسة الحالية على المنهج النوعي واتباعه لبيان فعالية أدب الأطفال في حل بعض المشكلات التي تواجهها معلمات رياض الأطفال بدولة الكويت عند تقديم الحقائق العلمية. وتم اختيار مفهوم "المادة" كنموذج لقياس هذه الفعالية. وقد تم اختيار ورشيتين من منظمة مارك الكبير التعليمية بطريقة قصدية لإجراء مقابلات مع معلماتهن. وفي ضوء تلك المقابلات تبين للباحثة أن القصص العلمية أكثر جدوى في حل بعض المشكلات مقارنة بكتب المعلومات، وذلك بسبب طبيعة الألفاظ المعروفة على المعلمة كالتراكيب والمكان. ومن هذا المنطلق تم إعداد مجموعة من القصص العلمية الإلكترونية، بحيث تسهم في حل بعض المشكلات التي وردت بالمقابلات، وتم تطبيقها على مجموعة من الأطفال، وخلصت الدراسة إلى فعالية القصص العلمية في توصيل وتذكر الحقائق العلمية بشكل فعال، وأشارت الدراسة إلى أهمية الصورة في القصص العلمية في توصيل المعاني المجردة. وتوصي الباحثة بأهمية الاهتمام بالحوارات والأنشطة التطبيقية المصاحبة للقصة، لما لها من بالغ الأثر في تنمية مهارات التفكير لدى الأطفال.

المقدمة

لا يختلف اثنان على أهمية العلم في تحقيق التقدم والرفاهية للمجتمع. ويعد تعليم العلوم مجالاً للتفكير بين الدول المتقدمة. وبما أن مرحلة رياض الأطفال أساسية بتعليمها المتعلم تتعلم بالمرحلة التالية، كان لابد من الاهتمام بتعليم الحقائق العلمية بشكل فعال يسهم فيهم وإدراكهم للعلم. وتعددت وتفرقت الطرق التي يمكن استخدامها في تدريس الحقائق العلمية. ومن الأساليب الممكن استخدامها القصة. وبعد القصة من أمث كالألعاب إلى ترميز الأطفال. فهي تجذب الأطفال بأحداثها المشتتة (باترني، 2003). وقد بين عبدالرحيم (2006) أن القصص الإلكترونية تمثل المرحل الأول من بين البرامج التعليمية لتعليم الروضة. ومن بين مجالات أدب الطفل التي تقدم لونا علميا واسفا أيضا هو كتب المعلومات، فهي تساعد على تقديم العديد من المعارف العلمية، وتجدهم يلهون ويتركون البيئة المحيطة (الشبيخ، 1994). لذا هدفت هذه الدراسة إلى تسليط الضوء على إمكانية توصيل أدب الأطفال بشبه العلمي (قصص علمية، كتب معلومات) في تدريس الحقائق العلمية وبيان دوره الفعّال في حل المشكلات التي تواجه معلمات رياض الأطفال عند تدريس المفاهيم العلمية.



أهداف الدراسة

- 1- التعرف على أبرز المشكلات التي تعترضها معلمات عند تدريس الحقائق العلمية.
- 2- بيان فعالية أدب الأطفال في حل المشكلات التي تواجهها معلمات رياض الأطفال عند تدريس الحقائق العلمية.
- 3- تحديد مدى توافر اللون الأدبي المنطوق بمفهوم المادة.

المنهجية

اعتمدت هذه الدراسة على المنهج النوعي وذلك لعدة أسباب وهي:

- 1- عدم وجود مقارنات محددة لدى الباحثة
- 2- المرونة التي يتميز بها البحث النوعي منسجم بطرائق البحث بشكل أكبر
- 3- الحاجة لاستخدام المقابلة بشكل كبير وتعد المقابلة إحدى الأدوات الشائعة الاستخدام في البحوث النوعية (إيوان، 2006؛ فتحي، والسمراني، 2009).

سبب اختيار مفهوم "المادة" كنموذج لهذا البحث

تعتبر خبرة "الماء والهواء" من الخبرات التي تقدم لتعليم الحقائق العلمية للطلاب المستويين: الأول والثاني في مناهج رياض الأطفال بدولة الكويت. وتعد هذه الخبرة من الخبرات الزائدة للحقائق والمفاهيم العلمية. وكما بين كل من صفات والشريفي (2000) في البحث النوعي (إيوان، 2006؛ فتحي، والسمراني، 2009).
تتميز خبرة "الماء والهواء" من الخبرات التي تقدم لتعليم الحقائق العلمية للطلاب المستويين: الأول والثاني في مناهج رياض الأطفال بدولة الكويت. وتعد هذه الخبرة من الخبرات الزائدة للحقائق والمفاهيم العلمية. وكما بين كل من صفات والشريفي (2000) في البحث النوعي (إيوان، 2006؛ فتحي، والسمراني، 2009).
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عينة الدراسة

عينة الأطفال: لقد تم اختيار الأطفال بشكل مقصود، ممن يتعلمون بالأساليب البصرية، وعدم التقييد.
عينة المعلمات: وقع الاختيار بطريقة مقصودة على المعلمات ممن كنهن المعرفة والخبرة في مناهج الخبرات السابق ومنهج إدخال المواد الحياتية. لذا تم اختيارهن من خبراتهن بشكل جيد. وتعد هذه العينة من نوع عينة الحالات الغنية (Rich Case)، حيث تكون قائمة بالمعلومات المراد الحصول عليها (فتحي، والسمراني، 2009).

عينة القصص: عبارة عن قصتين حول المواد العلمية. واحدة عن الهواء، وخمس قصص عن الماء، واحدة تحلق بالماء والهواء.

عينة كتب المعلومات: كلفت عبارة عن خمس كتب معلومات من النوع المنصوري، وثلاثة كتب كالتدريج، تتنوع بين الكتب المنصورية وكتب التجارب، وثلاثة كتب من كتب النظرة العامة وكتب التجارب العامة، وكلها من كتب التجارب وكتب تعليم الأحياء.

أساليب وتقنيات البحث

تورد جيسبي وبشكن (Glesne, Peshkin, 1992) ثلاث تقنيات لتجمع المادة الخاصة في الدراسات النوعية. وهي: الملاحظة والمقابلة والتوثيق. وقد استخدمت الباحثة التقنيات الثلاث في هذه الدراسة، حيث استخدمت المقابلة مع عينة المعلمات، والتوثيق والملاحظة مع عينة الأطفال.

النتائج

تشتمل البحوث النوعية من سؤال مفتوح يسعى الباحث لتفسيره (العلمي، والسمراني، 2009). والسؤال الرئيسي بهذه الدراسة لعل بتوضيح الفعالية الخاصة بأدب الأطفال مثلًا بالقصة وكتب المعلومات في تنمية المذاكرة العلمية لتعليم الروضة. وللإجابة عن هذا السؤال تشكلت العديد من الأسئلة التي حازت البحوث الإجابة عنها وهي:

السؤال الأول: ما طبيعة المشكلات التي تواجهها المعلمات في تدريس المعارف العلمية؟

من خلال المقابلة تبين أن المشكلات التي تعاني منها المعلمات في دولة الكويت أهمها بسبب القصور المعرفية عن كالتراكيب والمكان وهناك مشكلات أخرى موضحة بالتفصيل التالي:



السؤال الثاني: هل لأدب الأطفال بشبه العلمي (كتب معلومات وقصص علمية) دور في حل تلك المشكلات؟

القصص العلمية أكثر جدوى في حل بعض المشكلات مقارنة بكتب المعلومات والمنهج بسبب طبيعة المشكلات التي تعاني منها المعلمات بالأخص عند الوقت والمنهج.

السؤال الثالث: ما مدى مناسبة ما يقدم للمدربين من قصص علمية وكتب معلومات الشاملة "مفهوم المادة" لتعليم الروضة؟

بينت الدراسة على حد علم الباحثة محدودية القصص العلمية مقارنة بكتب المعلومات فيما يتعلق بمفهوم "المادة" وعند القيام بعملية التمثيل التام في الخارج لها نتيج أن القصص لا تتناسب مع طبيعة طفل اليوم الذي دخلت للتقنية إلى عالمه بشكل كبير.

السؤال الرابع: كيف تترى الميدان بكونه علمي مناسب لطلاب الروضة؟

من خلال بناء مجموعة من القصص العلمية الإلكترونية بحيث تسهم في حل الجزء الأكبر من المشكلات التي تواجهها المعلمة وتكون في ضوء محتوى المنهج. عشية إعداد القصص ابتداءً وبشياء وقد تم ابتداء من خلال التثقيف التفرقي وكذلك التثقيف بصحة ووضوح الرسوم من قبل مختصين بالمجال، والشكل التالي يوضح المراحل التي تم بها إعداد القصص الإلكترونية لبيان مدى فعاليتها:



وعد تطبيق القصص على الأطفال وإجراء تعديلات عليها وإعادة تطبيقها ظهرت العديد من النتائج الموضحة بالشكل التالي:

الخاتمة

اختتمت الدراسة بعدد من التوصيات وهي:

- 1- أهمية الاهتمام بالأنشطة المصاحبة عند عرض القصة، لما لها من أثر جوهري يرتكز بالمعلومات، إلى مهارات علمية في التفكير.
- 2- عند النظر إلى قصص الأطفال يتبين خلوها (إلا ما قل منها من تيرات الكتابة التي أشار لها نجيب (1994) حيث لابد من التأكيد عليها في القصص لما تحمله من تأثير على الطفل.
- 3- بحوي الميدان قصصاً علمية متنوعة لمرحلة الطفولة المنطوقة فلا ضرر من تبسيطها، فلما ذكر الشبيخ (1994) إن كثيراً مما ألف لصغار اليوم كان بالأصل كتب كبار، ولكن وجد أنه بعد تبسيطه وإعادة صياغته يحل ما يلزم قبول الأطفال.
- 4- إن إعداد كتب معلوماتية يتطلب إعداد محسومات ومطرات تفاعلية داخل الكتاب مما يخلق عتبة ممتعة في التعلم.
- 5- لتوظيف القصص بشكل التفرقي ونطاقها بجهاز محبب للأطفال (تلائية) كإسهول من فهم الحقائق العلمية عند الأطفال.

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دمج الطلبة ذوي الاحتياجات الخاصة في المدارس العادية بدولة الكويت

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جامعة الكويت

الخلاصة

هدفت الدراسة الحالية إلى البحث حول رأي المعلمين قبل الخدمة في برامج إعداد المعلمين بكلية التربية في جامعة الكويت حول مدى نجاح وتطبيق دمج الطلبة ذوي الاحتياجات الخاصة في مدارس التعليم العادية في دولة الكويت. صممت أداة للبحث حيث تضمنت أربعة متغيرات لقياس رأي المعلمين قبل الخدمة البالغ عددهم (144) من أصل (150) تم توزيعها عشوائياً. أشارت النتائج إلى وجود دلالة إحصائية في المتغيرات حول إعداد المعلمين للتدريس في مدارس الدمج، تطبيق الدمج، التعليم الشامل، الدمج بأنواعه. الاستنتاجات في هذه الدراسة تم تحديدها بدقة لمعرفة واقع الدمج في المدارس العادية بدولة الكويت، ووضعت التوصيات لمزيد من البحث في المستقبل حول دمج الطلبة ذوي الاحتياجات الخاصة في مدارس العادية.

المقدمة

علماء الدمج كنظام تربوي معاصراً أصبح توجهاً تعليمياً (Subotić & Anđić, 2014)، يحدد الممارسات التربوية المناسبة والمستخدمة في تعليم الطلبة ذوي الاحتياجات الخاصة في مدارس التعليم العادية (McLeskey, Hoppey, Williamson, & Rentz, 2004)، ويصعد به إحداث التغيير التعليمي والتغيير الاجتماعي في برامج ومؤسسات التعليم المعنية في تعليم الطلبة ذوي الاحتياجات الخاصة من خلال اتحاد التعليم الخاص والتعليم العادي لتقديم خدمات تعليمية متنوعة تهدف لمساعدة جميع الطلبة ذوي الاحتياجات الخاصة على التفاعل والمشاركة في جميع الأنشطة التعليمية داخل المدرسة والتعلم وفقاً لقرائهم واحتياجاتهم التعليمية (Rivera & Smith, 1997; Neary & Halvorsen, 1995).

تهدف الدراسة الحالية إلى معرفة رأي المعلمين قبل الخدمة حول دمج الطلبة ذوي الاحتياجات الخاصة في مدارس العادية بدولة الكويت، وقياس تطبيق الدمج في المدارس العادية وفقاً لمتغيرات محددة، وتقديم التوصيات وضوء النتائج الرئيسية لمزيد من البحث في المستقبل حول دمج الطلبة ذوي الاحتياجات الخاصة في المدارس العادية بدولة الكويت.

منهجية البحث والنتائج

هذه الدراسة تعتمد على منهج البحث الوصفي حيث صممت أداة للبحث تضمنت أربعة متغيرات رئيسية لقياس رأي الطلبة المعلمين قبل الخدمة في برامج كلية التربية بجامعة الكويت البالغ عددهم (144) من أصل (150) تم اختيارها عشوائياً. النتائج تشير إلى وجود دلالة إحصائية في المتغيرات حول كل من التعليم الشامل، الدمج بأنواعه المتعددة، تطبيق الدمج، إعداد المعلمين قبل الخدمة للتدريس في مدارس الدمج، كما هو مبين في الجداول (1، 2، 3، 4، 5).

جدول (1): نتائج معاملات الارتباط بين كل محور والدرجة الكلية للإستجابة.

الرقم	المحور	معامل الارتباط	مستوى الدلالة
1	التعليم الشامل	0.657	0.000
2	الدمج بأنواعه المتعددة	0.735	0.000
3	تطبيق الدمج	0.795	0.000
4	إعداد المعلمين للتدريس في صفوف الدمج	0.440	0.017

جدول (2): المتوسطات الحسابية، الانحرافات المعيارية، قيم (t) بين النوع بمحاور الإستجابة.

المحور	النوع	الجنس	N	Mean	Std. Deviation	T	Sig
(1) التعليم الشامل	ذكر	48	16.42	3.506	.580	.563	
	أنثى	96	16.77	3.432			
(2) الدمج بأنواعه المتعددة	ذكر	48	15.50	3.135	1.230	.221	
	أنثى	95	16.13	2.738			
(3) تطبيق الدمج	ذكر	48	17.46	2.760	.068	.946	
	أنثى	95	17.49	3.162			
(4) إعداد المعلمين للتدريس في صفوف الدمج	ذكر	48	16.96	3.803	.914	.362	
	أنثى	94	17.55	3.597			
المجموع	ذكر	48	66.33	10.062	.463	.644	
	أنثى	96	67.23	11.369			

جدول (3): نتائج اختبار تحليل التباين الأحادي للفروق بين متوسطات استجابات عينة الدراسة على حسب متغير الصف الدراسي.

المحور	Sum of Square	df	Mean Square	F	Sig
(1) التعليم الشامل	Between Groups	2	0.13	0.77	.989
	Within Groups	141	12.06		
(2) الدمج بأنواعه المتعددة	Between Groups	2	0.50	1.12	.943
	Within Groups	140	8.41		
(3) تطبيق الدمج	Between Groups	2	30.32	1.70	.035
	Within Groups	140	8.84		
(4) إعداد المعلمين قبل الخدمة للتدريس في صفوف الدمج	Between Groups	2	0.13	1.02	.990
	Within Groups	139	13.43		
المجموع	Between Groups	2	100.81	.433	
	Within Groups	141	119.59		

جدول (4): المقارنات البعدية للكشف عن مصدر الفروق لمحو تطبيق الدمج تبعاً لمتغير السنة الدراسية.

Sig.	Std. Error	Mean Difference (I-J)	ثانية
.625	1.014	.497	ثانية
.010	.517	1.349*	رابعة

جدول (5): نتائج اختبار تحليل التباين الأحادي للفروق بين متوسطات استجابات عينة الدراسة على حسب

المحور	مصدر التباين	مجموع المربعات	درجات الحرية	متوسط المربعات	قيمة F	مستوى الدلالة
(1) التعليم الشامل	بين المجموعات	73.63	7	10.52	0.88	0.525
	داخل المجموعات	1627.00	136	11.96		
(2) الدمج بأنواعه المتعددة	بين المجموعات	44.43	7	6.35	0.76	0.626
	داخل المجموعات	1134.56	135	8.40		
(3) تطبيق الدمج	بين المجموعات	60.34	7	8.62	0.94	0.478
	داخل المجموعات	1237.37	135	9.17		
(4) إعداد المعلمين للتدريس في صفوف الدمج	بين المجموعات	139.68	7	19.95	1.52	0.164
	داخل المجموعات	1754.71	134	13.09		
المجموع	بين المجموعات	548.30	7	78.33	0.65	0.718
	داخل المجموعات	16515.00	136	121.43		

الاستنتاجات والتوصيات

الإستنتاجات في هذه الدراسة تم تحديدها بدقة لمعرفة واقع الدمج في المدارس العادية بدولة الكويت، حيث وضعت التوصيات وضوء النتائج الرئيسية لمزيد من البحث في المستقبل حول دمج الطلبة ذوي الاحتياجات الخاصة في المدارس العادية بدولة الكويت. هذه التوصيات تتضمن الآتي:

ضرورة تنفيذ الدمج في المدارس العادية في ضوء إجراء مزيد من الدراسات العلمية المستفيضة لإستخلاص مؤشرات للدمج الناجح تعتمد على استخدام أفضل الممارسات التعليمية للدمج التي تكون مثبتة علمياً.

إجراء بحوث حول مدى توافق برامج إعداد المعلمين مع المعايير العالمية المعنية في التعليم الشامل وتطبيق الدمج في المدارس العادية بشكل ناجح وفعل يضمن تقديم خدمات تعليمية للطلبة ذوي الاحتياجات الخاصة بشكل مناسب لقرائهم واحتياجاتهم من خلال تحقيق التوافق العلمي والنظري والميداني لتمكين برامج إعداد المعلمين من صناعة معلمين قادرين على تعليم الطلبة ذوي الاحتياجات الخاصة في صفوف الدمج بأنواعه المختلفة ضمن المدارس العادية.

تقديم المناهج التعليمية في المدارس العادية للتأكد من موائمتها للمعايير العالمية فيما يخص دمج وتعليم الطلبة ذوي الاحتياجات الخاصة في نظم التعليم العام العادي، وأخيراً إجراء دراسات مسحية إستطلاعية حول إمكانية دمج الطلبة ذوي الاحتياجات الخاصة بمختلف مستوياتهم العقلية والبدينية في المدارس العادية وقياس مدى تأثيرها على تحصيلهم العلمي والنفسى والاجتماعي بدولة الكويت.

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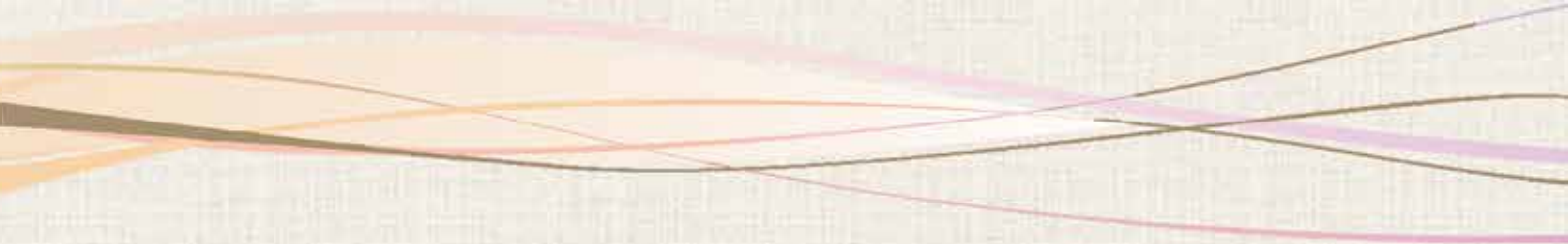
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التربية





Optimal Dynamic Pricing for Trade-in Programs

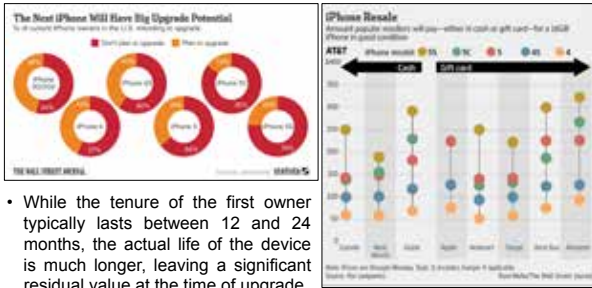
Mohammad Ghuloum*, Goker Aydin**, and Gilvan Souza**
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 ** Kelley School of Business, Indiana University

Abstract

When a trade-in manager acquires used electronics for resale, it uses dynamic pricing on both the acquisition and retail sides to simultaneously manage supply and demand. Motivated by the practice of a trade-in manager, we analyze a dynamic pricing problem, where not only the demand depends on the dynamic selling price, but also the supply can be influenced through the dynamic acquisition price. A firm with fixed inventory is always under pressure to sell the remaining inventory, yet when acquisition opportunities arise, the firm may become under pressure to acquire inventory in anticipation of a surge in demand. We establish conditions under which the firm will find itself under pressure to acquire versus pressure to sell, and we also study how the arrival pattern of acquisition and selling opportunities influences the optimal prices and the resulting profit.

Introduction

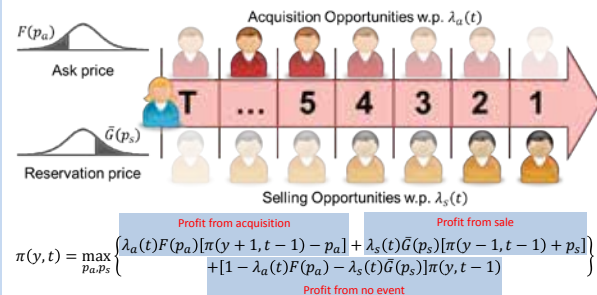
- Consumer electronic manufacturers such as Apple and Samsung update their product portfolio according to a predictable schedule, and many consumers upgrade their devices with each update. For example, 24% of iPhone 5s owners showed interest in upgrading to iPhone 6, just before the launch time of the latter (The Wall Street Journal 2014).



- While the tenure of the first owner typically lasts between 12 and 24 months, the actual life of the device is much longer, leaving a significant residual value at the time of upgrade.



Mathematical Model



$$\pi(y, t) = \max_{p_a, p_s} \left\{ \lambda_a(t) F(p_a) [\pi(y+1, t-1) - p_a] + \lambda_s(t) \bar{G}(p_s) [\pi(y-1, t-1) + p_s] + [1 - \lambda_a(t) F(p_a) - \lambda_s(t) \bar{G}(p_s)] \pi(y, t-1) \right\}$$

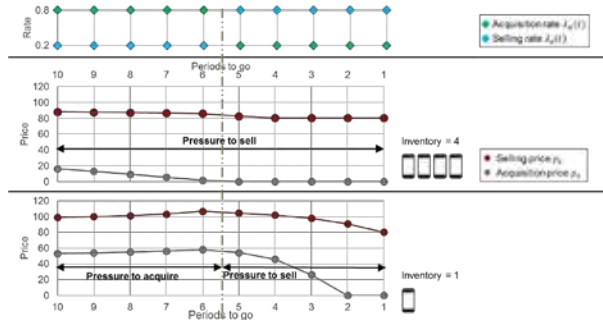
Marginal value of inventory: $\Delta(y, t) = \pi(y, t) - \pi(y-1, t-1)$

$\pi(y, t) = \pi(y, t-1)$ Carrying Over

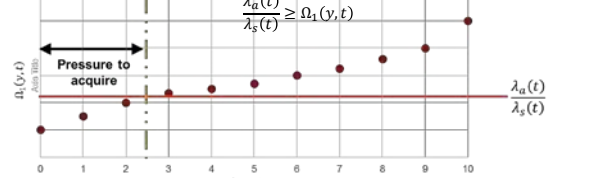
$+ \lambda_a(t) \max_{p_a} \{ F(p_a) [\Delta(y+1, t) - p_a] \}$ Expected contribution from acquisition $u(p_a, \Delta)$

$+ \lambda_s(t) \max_{p_s} \{ \bar{G}(p_s) [p_s - \Delta(y, t)] \}$ Expected contribution from sale $v(p_s, \Delta)$

Results on Pricing

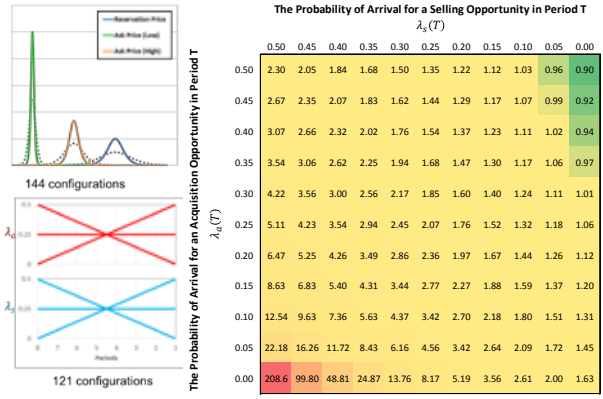


Proposition: Moving from period $t+1$ to t , the trade-in manager is under pressure to acquire (i.e., increases prices) if and only if



Proposition: If $\lambda_a(t)$ increases over time and $\lambda_s(t)$ decreases over time, then the trade-in manager will always decrease the prices at a given y

Results on Profit



Conclusion

- For a trade-in manager who dynamically acquire and sell over a finite horizon:
- When adjusting prices from one period to the next, the firm should ask whether it is under pressure to acquire; the answer depends on the arrival pattern.
 - Bulk acquisition yields higher profit than dynamic acquisition, unless most acquisition opportunities precede most selling opportunities.



Analysis of the Expectation of TQM Practices in Courier Service Providers in Kuwait: An Empirical Study

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Abstract

to investigate the attitude of courier service companies in Kuwait toward the application of total quality management (TQM) approach and its effect on business performance and customer satisfaction.

Introduction

TQM practices can help courier service providers to operate more effectively and efficiently and keep up with competition. Is this also the case in Kuwait?

Objectives

- Can TQM approach in Kuwait enhance business performance for courier service companies?

Methods

The MPTQM model is used to develop a questionnaire for survey analysis using Mann-Whitney and Kruskal-Wallis non-parametric tests.

Results

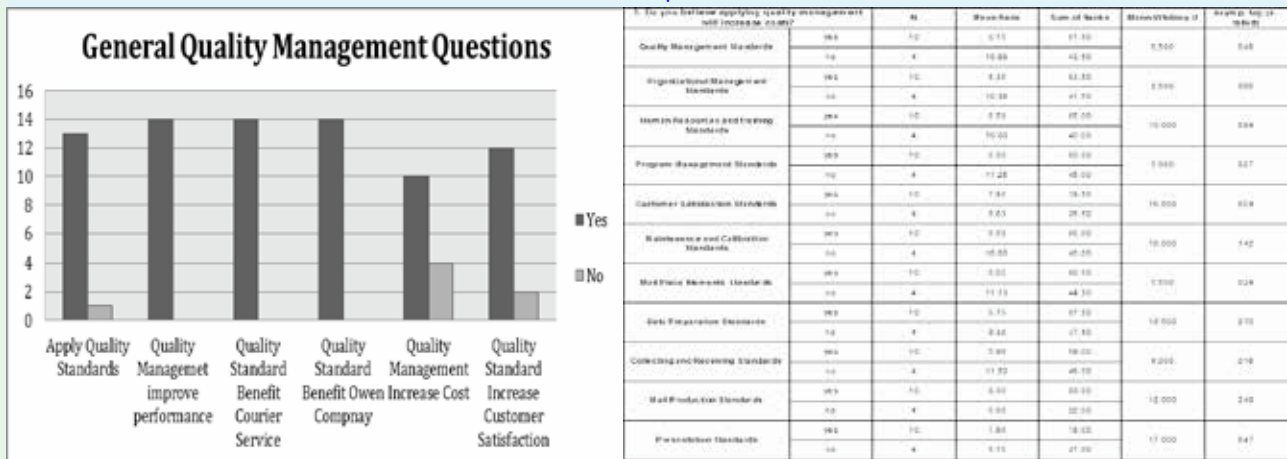
The attitude of courier service industry in Kuwait toward TQM has no significant impact on business performance and customer satisfaction, resulting in an inability to reject the null-hypothesis.

Conclusion

The courier service industry in Kuwait is mainly dependent on government intervention and personal social networking rather than the actual quality of service provided.

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The Supply Chain Tuner Model: Achieving a Better Strategic Fit

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Abstract

A SC tuner model is proposed to find optimal combination of SC drivers for ultimate strategic fit between organizational strategy and SC design.

Introduction

The effectiveness of a (SC) design is determined by how well it is aligned with the overall organizational competitive strategy in meeting customer needs.

Objectives

- Determine the optimal level of efficiency and responsiveness of SC design.

Methods

- A BIP model is developed and used to determine the optimal SC design decisions.
- Develop an efficiency-responsiveness scale for SC design.

Results

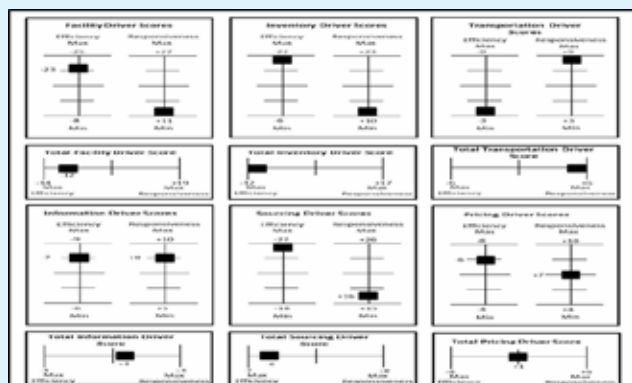
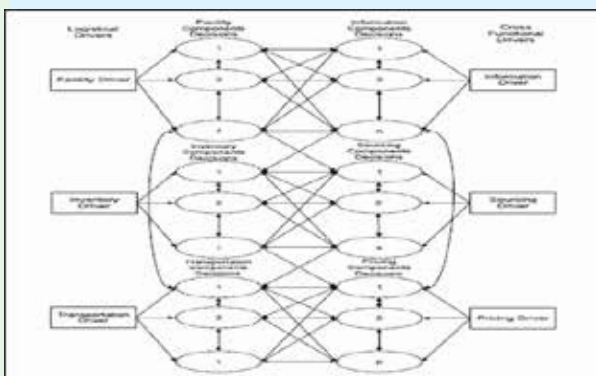
An optimal SC drivers' decisions were determined for an apparel company. A "highly efficient" SC design was achieved. The company can better tune their SC design to meet organizational strategy.

Conclusion

The SC tuner model can help develop different SC portfolios, each directed toward various level of efficiency and responsiveness.

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A Research Case Study: Difficulties and Recommendations when Using a Textual Data Mining Tool

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Abstract Although many interesting results have been reported by researchers using *numeric* data-mining methods, there are still questions that need answering before *textual* data mining tools will be considered generally useful due to the effort needed to learn and use them. In 2011 up to 2013, we generated a dataset from the legal statements (mainly privacy policy and terms of use) on the websites of 475 of the US Fortune 500 Companies and used it as input to see what we could detect about the organizational relationships between the companies by using a textual data mining tool. We hoped to find that the tool would cluster similar corporations into the same industrial sector, as validated by the company's self-reported North American Industry Classification System code (NAICS). Unfortunately, this proved only marginally successful, leading us to ask why and to pose our research question: What problems occur when a data-mining tool is used to analyze large textual datasets that are unstructured, complex, duplicative, and contain many homonyms and synonyms? In analyzing our large dataset we learned a great deal about the problem and fortunately, after significant effort, determined how to "massage" the raw dataset to improve the process and learn how the tool can be better used in research situations. We also found that NAICS, as self-reported by companies, are of dubious value to a researcher—a matter briefly discussed.

Introduction Electronic commerce is now an important part of national and international trade and thus more controls are needed to ensure effective website design and an efficient way of servicing customers. Thus the material on a company website should be provided to satisfy the needs of worldwide customers whose search should be easy to perform; the data, of course, should be accurate and easy to understand. In our attempt to assess the "value" of a website, we decided to use a textual data mining tool. This led us to ask questions about the problems and potential of mining the contents of websites and to try to determine the difficulty in mining rather sparse and yet complex data.

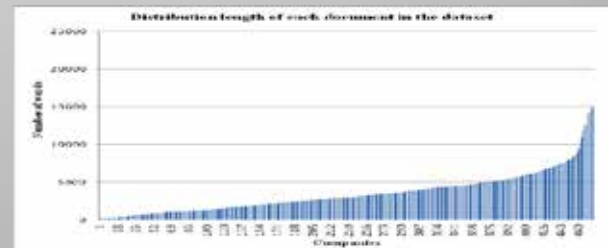
Objective our research attempted to answer two questions:
1. Is it possible or reasonable to evaluate the effectiveness of the textual data mining process by finding how closely the clumps resulting from the use of the data mining tool on data downloaded from a corporate website is explained by the corporation's self-reported NAICS code?
And, because of our answer to this, it was necessary to add:
2. What has to be done to the downloaded data to allow a tool to clump the data meaningfully?

Methodology First, we downloaded the legal statements of the Fortune 500's websites and used CLUTO – a data mining tool to cluster our data; Second, we experimented to find the appropriate number of clusters needed to give good results in our experiments. Then, we attempted to improve the clustering by removing inappropriate material from the dataset. This involved removing words such as *cookie* (that occurs on most websites) or phrases like *limited liability*, *abbreviations*. As a final step, once we established an unbiased dataset, we added the self-defined NAICS codes for each company in the hope that we would find that companies had clustered into groupings that were in the same industry.

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Results



There are obvious overlaps and similarities of corporations in the same industry but, as NAICS are self-reported and not reviewed by anyone outside the organization, there was no guarantee that they collectively made good sense. The fact that they are used by US governmental and other statistical bodies despite their potential deficiency raises serious policy questions that require further examination.

Conclusion During our analysis of the rather large textual dataset we encountered many "strange" findings which we were able to clarify by applying manual analysis. The unstructured, complex, duplicative nature of the large datasets provided results that seemed inconsistent until we could tell why the software provided the results. We found it necessary to make adjustments to the datasets to reduce errors caused by: *Similar words, synonyms, and phrases* such as *Cookies*, and *Links* which acted as discriminating leading to the clustering of unrelated industries. We feel this research is still in its infancy stage and a use of different data mining tools may serve as a great exercise to see if we get similar results.

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Goal Programming with Extended Factors for Portfolio Selection

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Abstract

We propose and examine the use of several stock related factors called extended factors for portfolio selection. These factors that include the traditional factors of risk and return are represented as objectives in weighted Goal Programming models. Several models with passive and active target values and various weights for their unwanted deviational variables in the achievement function are developed. The weights and the target values of the extended factors represent decision makers' utility towards their portfolio.

Method Goal Programming Model

$$\text{Min } \frac{\alpha_{RE}}{k_{RE}} n_{RE} + \frac{\alpha_{DA}}{k_{DA}} n_{DA} + \frac{\alpha_{ES}}{k_{ES}} n_{ES} + \frac{\alpha_{PB}}{k_{PB}} n_{PB} + \frac{\alpha_{OC}}{k_{OC}} n_{OC} + \frac{\beta_{RI}}{k_{RI}} p_{RI} + \frac{\beta_{DA}}{k_{DA}} p_{DA} + \frac{\beta_{DY}}{k_{DY}} p_{DY}$$

Subject to:

$$\sum_{j=1}^{30} R_j x_j + n_{RI} - p_{RI} = b_{RI}$$

$$\sum_{j=1}^{30} RE_j x_j + n_{RE} - p_{RE} = b_{RE}$$

$$\sum_{j=1}^{30} DA_j x_j + n_{DA} - p_{DA} = b_{DA}$$

$$\sum_{j=1}^{30} ES_j x_j + n_{ES} - p_{ES} = b_{ES}$$

$$\sum_{j=1}^{30} PB_j x_j + n_{PB} - p_{PB} = b_{PB}$$

$$\sum_{j=1}^{30} DY_j x_j + n_{DY} - p_{DY} = b_{DY}$$

$$\sum_{j=1}^{30} OC_j x_j + n_{OC} - p_{OC} = b_{OC}$$

$$\sum_{j=1}^{30} x_j = 1$$

$$x_j \geq 0 \quad j = 1, \dots, 30 \quad \text{and all } n \text{ and } p \text{ variables} \geq 0$$

Factors:

- Risk (b_{RI})
- Return (b_{RE})
- Debt/Asset (b_{DA})
- Earnings per Share (b_{ES})
- Price/Book Value (b_{PB})
- Dividend Yield (b_{DY})
- Operating Cash Flow Ratio (b_{OC})

Conclusion

The results of the experimentations show promising signs for exploiting extended factors for stock portfolio selection problems. Moving away from the 'traditional' risk and return factors and toward the use of several factors for portfolio selection is certainly worth further investigations. This experiment shows that some of constructed portfolios, with much less number of constituents, outperform DJIA quite considerably in terms of their performance measured by risk and return.

Portfolio Selection	GP with Extended Factors						DJIA
	Fundamental Decision			Technical Decision			
	Active Target Values	Active Weightings	Active Weightings and Target Values	Active Target Values	Active Weightings	Active Weightings and Target Values	
No. of Stocks Selected	8	7	7	5	6	4	30
Overall Risk	0.0065	0.0092	0.0068	0.0060	0.0075	0.0054	0.0061
Overall Return (%)	0.16	0.07	0.18	0.01	-0.14	0.17	0.10
Sum of Deviation from DJIA	0.009	-0.004	0.013	-0.013	-0.035	0.011	Not Applicable



Perceived Threat And Its Impact on Consumer Behavior

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Abstract This study expands upon previously conducted terror management theory research by incorporating the just-world theory as a means through which to connect these two well-established theories. Despite the theories' well-established roots in psychology and despite rising interest among consumer researchers, the associations between existential insecurity and motivation have just begun to be explored. Three themes emerged that can help explicate this relationship.

Introduction

In 2012, a survey of individuals in over twenty countries showed that one in seven people worldwide believes the world will end during his or her lifetime (Michaud 2012).

The severe disruptions to modern conveniences (e.g., grocery stores, electrical grids, and subway systems) caused by hurricanes Katrina and Sandy, the Fukushima meltdown, and the Haiti earthquake revealed the difficulty of life without these services. In response to such events, a growing number of people have reevaluated their preparedness for future emergencies (Raasch 2012; Byrd 2012). This group of people is collectively known as preppers (Palmer 2012; Cobb 2012).

Objectives and Significance

A Consumer Culture Phenomenon



Academic Perspective

- There've been studies on communal consumption centered around specific brands-- the Cult of Macintosh (Belk and Tumbat 2005), Harley Davidson (Schouten and McAlexander 1995), and X-Files (Kozinets 1997).
- No marketing studies on survivalists' culture. Only few studies around the end of life among consumer researchers (e.g. Hirschman (1990), Price, Arnould, and Curasi (2000));
- A handful of consumer behavior researchers employed terror management theory in their analysis (e.g. Behavioral: Ferraro, Shiv, and Bettman (2005); IP: Maheswaran and Agrawal (2004); CCT: Bonsu and Belk (2003))
- In all of these studies, the terror under investigation affected only an individual or a local community (Bonsu and Belk 2003). However, preppers anticipate a life-threatening event that could lead to the collapse of society.
- This paper is an extension of these areas of research as it focuses on communal consumption that spans across many products and services in anticipation of a life-changing disaster.

Methods

Netnography is a qualitative method derived from ethnographic techniques to analyze the interactions of individuals through computer-mediated communications (Kozinets 2010).

Netnography also allows for naturalistic observation. This approach is a more reliable way of data collection as consumers are in discussion with similar others.

Atlas.Ti (a computer software) was used to collect and organize the data.

- Data sources:**
 - American preppers Network
 - TV Show Doomsday Preppers



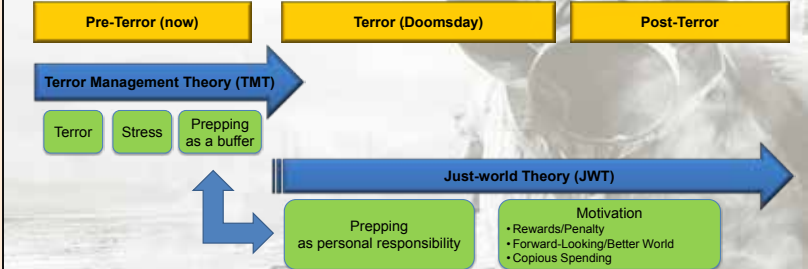
Findings

- Three themes emerged from the data collected about prepper's consumption behavior.
 - "Because I spent a lot of time preparing for the worst case scenario, I can afford to be cheerful for the rest of the time"
 - "Those who are snide and cynical about prepping will get what they deserve in the end, anyways..."
 - "I have everything for full flavor and gourmet foods. If the world comes to an end... I'll be the only one standing there who has extra 100 lbs to lose [laughs]. Everyone else will be skin and bones"
 - "It's not a very comfortable road, that one that everyone is taking over there is MUCH easier, looks like it's downhill the whole way..."
 - "You have home owners insurance. You have car insurance. You have flood insurance. What about food and power insurance?"
 - "I want to be here. I want to see this false paradigm collapse. I want to be a positive part of rebuilding the world without all of the corporate control, without all of the media brainwashing, without the "elite" mentality."
 - "[We] have no other interest or purpose in life other than prepping for some Armageddon"
 - "Because we prep, we lost cars, we lost houses."

The End is Near	You Reap What You Sow	A Better World
Preppers' anticipation of a looming disaster consume every aspect of their life and makes it stressful. This is a never-ending task where a person gets more consumed the more he/she continues on this journey. This behavior can be explained by the Terror Management Theory (Greenberg, Pyszczynski, and Solomon 1996), which posits that human behaviors are motivated by the need to protect oneself against anxiety caused by the awareness of mortality (Bonsu and Belk 2003).	Preppers believe that the world is 'just' and that people get what they deserve. The Belief in Just-world theory posits that people have the tendency to believe that the world in just where people get what they deserve (Lerner 1980). This belief enables individuals to view the world as an orderly and stable place, which is necessary for commitment to long term goals (e.g. self-reliant) and day-to-day functioning (White, MacDonnell, and Ellard 2012).	Preppers spend copious amount of money in their preparation for post-apocalyptic world. It has been shown that human awareness of threat affects materialism, conspicuous consumption to enhance self-esteem or support one's cultural worldview (Arnold et al. 2004, Bonsu and Belk 2003). Thinking of doomsday causes preppers to reflect on the meanings and value of life, which may represent their pursuit of symbolic immortality through material possession (Hirschman 1990).

Discussions and Conclusions

- Theoretical Implications**
 - Three overarching patterns emerged during data analysis that can be viewed through the theoretical lenses of terror management(TMT) and just-world theories(JMT) (as depicted in the diagram below).
 - Although TMT can explain the terror, stress and the use of prepping as a buffer, it does not explain preppers' anticipation for "A Better World". Thus, it only explains their behavior now in anticipation of doomsday (Pre-Terror).
 - Similarly, JMT explains preppers' sense of responsibility because the "End is Near" and their motivation is driven by their belief that "You Reap What You Sow" in a Post-Terror world, but it does not explain the terror and stress that preppers go through on a daily basis.
 - These findings also indicate that just by reframing an idea (i.e. prepping) from something that is personal (enhancing anxiety-buffer) to something that is expected and required from everybody (personal responsibility), a relationship is established between terror management theory and just-world theory. This link between the theories help explain preppers consumption behavior.



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The Effect of Customer Experience Management (CEM) on Customers' Word-of-Mouth: Evidence from the Telecom Industry in Kuwait

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Abstract

Genuine academic effort to study CEM with service providers in Kuwait has been virtually non-existent. This research attempts to fill this gap in ways that enables it to be a viable managerial tool to improve customers' word of mouth. Therefore, the researchers argue that customer satisfaction with the company's CEM stages has a positive effect on customers' trust (Hypothesis 1). In addition, as customers' trust increases, customers engage in more positive word of mouth (Hypothesis 2). To test for these hypotheses, the researcher surveyed 1,930 telecom users in Kuwait and utilized SEM analyses.

Objectives

One of objectives is to examine the effect of CEM on customers' word of mouth in the telecom industry in Kuwait. Also, the research identifies important customer experience (CE) stages to help telecom companies improve their CE stages.

Methods

An online survey was administered to 1,930 mobile users in Kuwait (1,078 females and 852 males; age = 28.4 yrs; ranging from 12-63 yrs). Participants completed a CEM scale, which included pre-, at-, post-purchase, and service failure stages. Also, customers' word of mouth and trust were measured using existing scales (all scales used 7-point Likert scale). A set of reliability analyses indicated that all scales were above .88; confirming the reliability of the scales. An SEM analysis was used to analyze the paths model.

Results

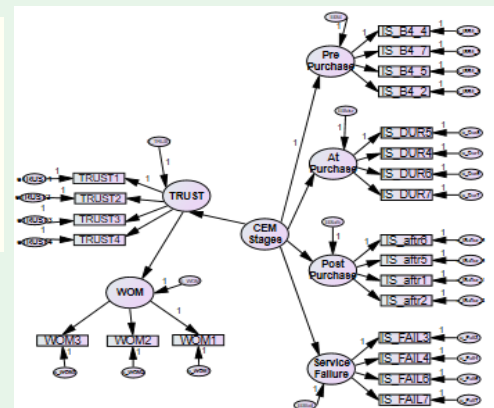
Results of the full structural model indicated good fits (CFI = .96; GFI = .94; RMSEA = .05). As hypothesized, the direct path from CEM stages and customers' trust is significant ($\beta = .78$, SD = .033, $p < .001$), supporting hypothesis 1. Also, the direct path from customers' trust and word of mouth is significant ($\beta = .86$, SD = .023, $p < .001$), supporting hypothesis 2.

Conclusion

This research studies CEM in ways that enables it to be a viable managerial tool to improve customers' word of mouth. The data demonstrate that an increase in customer satisfaction with the company's CEM stages will result in an increase in their trust with the company. Also, as customer's trust increases, their engagement in positive word of mouth increases.

References

- Bharwani & Jauhari (2013)
- Holbrook (2006)
- Pine & Gilmore (1998)
- Pine & Gilmore (2011)



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The Effect of Nostalgic Packaging on Consumers' Responses to Brand Evaluations

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Abstract

Nostalgia, one's sentimental longing for the past, has been utilized in marketing communications by a number of companies around the world because of its positive effect on consumers' responses. In this research, the nostalgia effect was operationalized in a lab experiment using nostalgic packaging cues in ads. The findings from 393 undergraduate students from Kuwait University demonstrated that participants in the nostalgic (compared to non-nostalgic) condition responded more positively to brand evaluations due to higher ad involvements. Implications for nostalgic brands are discussed.

Objectives

The main objective of this research is to examine how nostalgic packaging influences consumers' responses to brand evaluations. In addition, the research is intended to provide practical implications for nostalgic brands in Kuwait.

Methods

A lab experiment was conducted on a sample of 393 undergraduate students from Kuwait University (67 males and 326 females; age = 21.3 yrs). In the experiment, the researcher manipulated one of KDD ads by using old KDD ice-cream packages (nostalgic) and new ice-cream packages (non-nostalgic). After viewing the ads, participants completed measures of purchase intentions, word of mouth, brand attitudes, ad attitudes, and product quality (7-point Likert scale). ANOVA and regression analyses were used to analyze the data.

Results

A set of ANOVA analyses indicated that participants in the nostalgic condition (compared to non-nostalgic condition) had higher purchase intentions, word of mouth, brand attitudes, ad attitudes, and product quality. Also, Baron and Kenny's (1986) procedure using regression analyses proved that these examined relationships were mediated by ad involvements. All p 's $< .05$.

Conclusion

The research indicates that companies wishing to obtain the greatest impact from packaging cues must take into consideration nostalgia effect and target consumers' prior associations with the brand. This strategy was proven, in this research, to influence consumers' responses positively.

References

- Holbrook (1993)
- Muehling (2013)
- Muehling et al. (2014)



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Random Walks and Market Efficiency: Evidence from Real Estate Investment Trusts (REITs) Subsectors

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Abstract:

This paper investigates the random walk behavior of real estate investment trust (REIT) subsectors using monthly data from January 1994 to July 2015. Using variance ratio tests, the results suggest that subsectors of lodging/resorts and self-storage do not follow a random walk that contradicts the weak-form efficient market hypothesis. Using non-parametric runs test, we find that subsectors of office, industrial, mixed, free standing, shopping centers, apartments, manufactured homes, and timberland are weak-form efficient. The evidence in this study supports the view that there are some subsectors that are more informational efficient than other subsectors

Introduction:

Real estate investment trust (REIT) subsectors have different characteristics, risks, cycles, and behave differently from one another and deserve to be evaluated independently. For example, lodging/resort REITs are viewed as aggressive investments with cyclical and volatile room and occupancy rates while healthcare, manufactured housing, and self-storage REITs are thought to be somewhat recession resistant (Block, 2012). Since we expect REIT subsectors track their underlying real estate market and therefore to behave differently, we investigate market efficiency for the main subsectors of the REIT market. Both academic scholars and market practitioners are interested in the topic of market efficiency and understanding the behavior of REIT returns. Practitioners seek to develop trading strategies based on the market inefficiencies and asset mispricing.

Objectives:

This study represents the first one to provide new empirical evidence on the efficiency and random walk behavior of REIT subsectors. Also, we use recent data that extends to July 2015 to test the random walk hypothesis of the REIT subsectors. Market efficiency of REITs could be affected by the global financial crisis and our data covers the most recent economic recession, coined the Great Recession, and the post-crisis periods. Finally, our study complements and logically extends the work of Kleiman et al. (2002), Jirasakuldech and Knight (2005), and others who have investigated the market efficiency of equity REITs.

Methodology:

The current study employs monthly REIT subsector indices from January 1994 to July 2015. This study applies conventional methods of the variance ratio and the modified non-parametric signs and ranks based variance ratio to test the random walk hypothesis in REIT subsectors. In addition, we use the non-parametric runs test.

Results:

Results indicate that the subsectors of office, industrial, mixed, free standing, apartments, manufactured homes, and timberland are regarded as weak form efficient. In these subsectors, future returns are not related to the past and current prices reflect all public information. As a result, traders are not able to use technical analysis to achieve abnormal profits. The evidence in this study supports the view that there are some subsectors that are more informational efficient than other subsectors.

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Table 1 – Non parametric runs tests

	M	E(M)	$\sigma(M)$	Z
Office	123	130.5	8.031	-0.934
Industrial	117	130.5	8.031	-1.681
Mixed	121	118.5	7.649	0.327
Shopping	111	130.5	8.031	-2.428 **
Regional Malls	121	130.5	8.031	-1.183
Free standing	121	130.5	8.031	-1.183
Apartments	135	130.5	8.031	0.560
Manufactured Homes	125	130.5	8.031	-0.685
Diversified	113	130.5	8.031	-2.179 **
Healthcare	113	130.5	8.031	-2.179 **
Lodging	113	130.5	8.031	-2.179 **
Self storage	125	130.5	8.031	-0.685
Timberland	26	28.5	3.674	-0.680
Infrastructure	29	22.5	3.240	2.006 **

M is the actual number of runs, E(M) is the expected number of runs, $\sigma(M)$ is the standard errors of runs, ** indicates significance at the 5% level.

Conclusion:

The purpose of this present study is to examine the random walk behavior of REIT subsectors. Using variance ratio tests, the results from this research suggest that subsectors of lodging/resorts and self-storage do not follow a random walk. We confirm this finding using runs tests and reject the null hypothesis of randomness for lodging/resorts and self-storage. Technical equity traders could potentially find opportunities for profitable trading strategies based on historical pricing information if the market is not weak form efficient. However, we must recognize that abnormal returns could be eroded away by transaction costs

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Republican Managers & Innovation

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Abstract

We examine how managers' political orientations and ideologies affect corporate innovative production. We conjecture that Republican managers are likely to have conservative personal philosophies that will spill over to their corporate decision-making. We find evidence to that effect.

Introduction

Upper echelon theory suggests that company CEOs act on their personal interpretations of strategic situations. Their interpretations are informed by their experience, values, and personalities.

Objectives

We aim to test this notion by examining the effect of political values of CEOs and their top management team and ideology on innovation production in the firm.

Methods

- Innovation is measured by patents produced and the citations they receive.
- Political ideology is measured through an executive's political contribution.
- We employ a Diff-in-Diff approach using 9/11 Attacks as an exogenous shock to uncertainty.

Results

- Republican CEOs and managers produce less patents.
- The patents produced by Republican CEOs and managers receive less patents.
- The patents produced by Republican CEOs and managers show smaller variability in terms of their originality and generality.

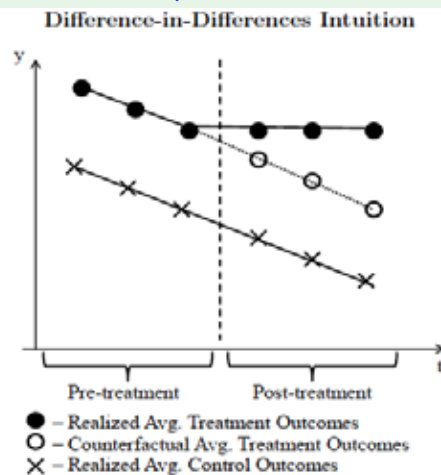
Conclusion

- Executive values matter
- Conservative (i.e. Republican) managers produce less innovation.

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VARIABLES	Number of Patents (1)	Total Citations (2)
REP _{CEO} *Sep 11	-0.2321** (0.025)	-0.4215** (0.012)
Controls	Yes	Yes
Observations	10,088	6,449
Year FE	Yes	Yes
Firm FE	Yes	Yes



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What is the Right Number of Stocks for a Kuwaiti Investor?

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Abstract

The paper makes the first attempt to provide empirical evidence on the optimal size portfolio for a Kuwaiti investor by using repeated sampling with replacement to simulate hundred portfolios for several sizes in Kuwait. The empirical results reveal that the size of a well diversified portfolio varies from 15 to 20.

Introduction

The Capital Markets Authority (CMA) took a decision that the minimum number of holdings in any mutual fund that invests in the general stock market is 10 different securities.

Objectives

Provide an empirically tested optimal number of stocks in a portfolio whether for mutual funds or for individual investors that provides the highest level of diversification benefits and risk reduction.

Methods

- Use repeated sampling with replacement to simulate hundred portfolios for several sizes.
- Use standard deviation as a measure of risk.
- Use other measures of risk for robustness.

Results

- As portfolio size increases standard deviation decreases.
- A well diversified portfolio varies from 15 to 20.
- Investors do not have much benefit by increasing the size of their portfolio beyond 30 stocks.

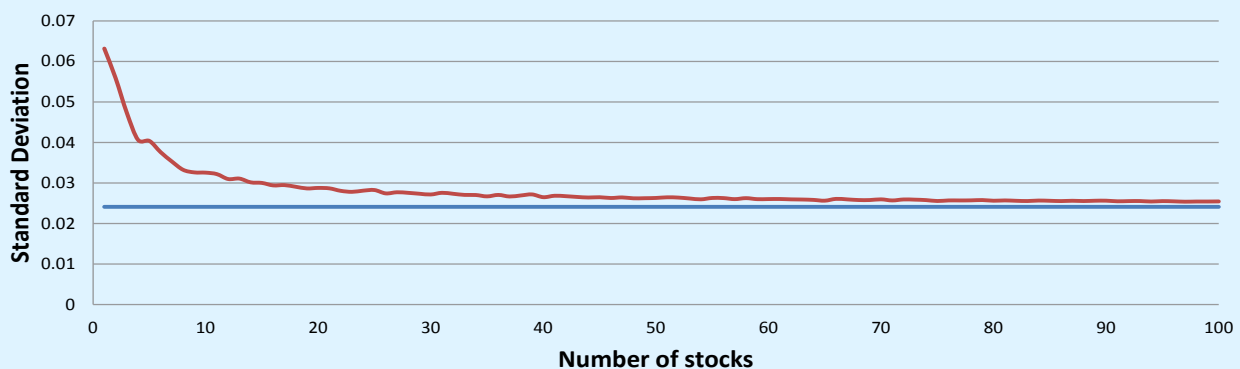
Conclusion

- Our results are consistent with the decision of the Capital Markets Authority requiring mutual funds to invest in a minimum of 10 securities.
- Proper diversification is achieved by investing in 15-20 stocks

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Optimal size portfolio in Kuwait



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“Determinants of Political Instability across Arab Spring Countries”

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Abstract:

This paper investigates the determinants of the political instability across Middle East and North Africa (MENA) region with special attention to the Arab Spring-affected region. The yearly data set covers 19 countries in the MENA region for the period 1975–2014. The study uses pooled OLS, fixed effect, and random effect approaches. The findings show that macroeconomic factors, socio-demographic factors, and political factors were all important contributors to the political instability in MENA countries. The results confirm that factors such as food prices, GDP growth, youth unemployment, trade openness, democratic governance and regime durability had a significant influence on political stability in the MENA region.

Introduction:

It will come as no surprise to even casual observers of world affairs that the Middle East is one of the most politically unstable regions in the world. Although there are some disputes about the best way to measure internal unrest that challenges governmental authority, a weighted conflict index that comprises nine different indicators (assassinations, coups, government crises, anti-government demonstrations, riots, strikes, purges, guerilla activity, and revolutions) places a good number of Middle Eastern countries near the top of the list of unstable countries (Banks 2015). Many citizens of the MENA do not enjoy peace and security, let alone the ability to participate productively in their nation’s political life.

Objectives:

This paper draws on and extends the literature to examine the causes of political unrest in the MENA region. Given the importance of the Arab Spring disruptions in the early years of this decade, we examine political unrest in five countries (Tunisia, Libya, Egypt, Syria, and Yemen) to gain a more specific understanding of the links between political-economic conditions and political instability.

Methodology:

To accomplish goals of the study, the study investigates a panel of 19 countries in the MENA region during the 1975-2014 period. In the study, panel data techniques are used accounting for both unobservable cross-country heterogeneity and common year shocks using fixed and random effect techniques.

Results:

This study finds three important results. With respect to economic factors, political instability in the region is directly related to food price inflation and inversely related to real GDP growth. Second, the key socio-demographic factor that makes countries vulnerable to political instability is youth unemployment. Third, with respect to political factors, regime durability promotes greater instability, but democratic governance measures provide contradictory results.

Conclusions and Policy Implications:

On one hand, findings support other studies that conclude that the increased presence of formal democratic institutions leads to less political instability for the whole MENA region.

Dependent Variable: Political Instability; Weighted Conflict Index	Pooled OLS	Time Fixed Effect	Random Effect
Food Price Index	10905.58*** (2239.191)	13976.58*** (2377.627)	12817.93*** (2252.57)
Real GDP Growth	-878.0296** (384.4165)	-739.8751** (361.8218)	-839.3709** (356.3187)
Trade Openness	-6247.207*** (1725.205)	-14160.1*** (3923.201)	-11283.53*** (2921.017)
School Enrollment	-6139.178*** (2597.413)	-12300.11 (8046.897)	-6803.598** (3234.73)
Youth Unemployment	1429.4 (1605.43)	10406.52*** (3430.33)	6068.808** (2604.481)
Democracy Index	-9.253859 (12.88221)	-2.864164 (14.56475)	-6.122604 (13.43891)
Regime Durability	1209.98*** (454.6234)	1237.296*** (423.7899)	1261.219*** (421.3807)
Obs.	248	248	248
R2/ Adjusted R2	0.3172	0.3866	0.3774

On the other hand, strong evidence is found in Egypt that attempts to create more democratic governance led to more political disruption. Nevertheless, it is clear that the economic challenges of economic stagnation, youth unemployment and food security play an important role in the political life of most MENA countries. In addition, the study suggests that economic openness is not an enemy of political economic stability. Indeed, being able to integrate successfully into the global economy seems to be an important prerequisite for creating sustainable forms of political governance.

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“Impact of Gender Inequality on Economic Growth in the Arab Region”

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Abstract

This paper investigates the impact of gender inequality in education and the labor force on the economic growth of Arab countries. The data set covers 19 countries over the period from 1990-2014. The estimated model is tested using Pooled OLS and Fixed Effect regressions. The findings show no significant relationship between gender inequality in education and the economic growth. In fact, the model shows that the main factors driving the economies of the Arab Region are capital accumulation and population growth.

Introduction

Gender inequality has been an important issue in the Arab region. Although concerns of gender inequality are visible on many social, political, and anthropological levels; its economic impact on the growth and development of Arab economies is an angle that is worth investigating. The main purpose of this study is to investigate whether or not improvements in gender equality would cause economic growth and development in the Arab region.

Objectives

This paper seeks evidence on the effect of gender inequality on the growth of Arab economies. It is examined using the Gender Parity Index and Labor Force Participation Rates of Females as gender inequality indicators and testing their effect on the growth rates of real GDP of Arab countries.

Methodology

The study tests predictions of the model using data for the period from 1990 to 2014. The empirical model is estimated using panel model framework. Specifically, the study uses Ordinary Least Square and Fixed Effect Regression techniques to test the long run relationship between gender inequality and economic growth in the Arab Region.

Results

This study provides evidence of the impact of gender inequality in education and the labor market on economic growth in the Arab region. Panel regression of 19 Arab countries over the period from 1990-2014 is used to discover that gender inequality has a minimal effect on economic growth in this region. In fact, it is clarified that other factors of capital accumulation and population growth are highly significant with economic growth compared to the rest of the variables used.

This result is rational and consistent with the fact that most countries in the Arab region rely heavily on investments leading to capital accumulation and on population growth. As long as these two factors are growing, gender inequality will not hinder the economic growth of these countries.

Var	Coeff.	Std. Err.	t	Interval	P> t	95% Conf.
LnGICU	0.3527054	0.1240178	2.84	0.3969039	0.005	0.1085068
LnLFFP	-0.0102567	0.1145457	-0.09	0.2152906	0.929	-0.2358039
LnLIFM	0.8535222	0.5183778	1.65	1.874239	0.101	-0.1671946
LnGPI	0.6100914	0.6492197	0.94	1.888444	0.348	-0.6682611
LnTrade	0.0389997	0.142902	0.41	0.3385900	0.679	-0.2715999
LnPop	0.1694898	0.01834679	7.413	0.3338826	0.000	0.0050970
LnOil	-0.0004798	0.0762851	-0.01	0.1487301	0.995	-0.1506897
_cons	-3.679922	2.232248	-1.58	0.894692	0.114	-8.254537

Conclusions and Policy Implications

Findings show that other factors of capital accumulation and population growth are in fact highly significant with economic growth compared to the rest of the variables used. This result is rational and consistent with the fact that most Arab regions rely heavily on investments leading to capital accumulation and on population growth. Therefore, policies should be oriented towards improving the welfare and health of individuals to enhance population growth of both genders as it is found to be a major factor affecting GDP growth of the Arab region. Policies towards investments to enhance capital accumulation are mostly recommended in the case of economic growth of the Arab region since this factor was found to be the most effective of all variables.

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“الاقتصاد الكويتي ما بين أثر الغزو العراقي والوضع الحالي”

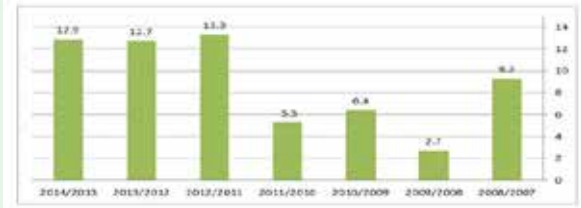
الدكتور نايف الشمري

عضو هيئة تدريس في قسم الاقتصاد ، كلية العلوم الإدارية

الخلاصة:

شمل البحث دراسة تحليلية مقارنة للأثار الاقتصادية للغزو العراقي على دولة الكويت وأبعادها الحالية على وضع الاقتصاد في الدولة. اعتمدت الدراسة على عمل مقارنة بين الوضع الاقتصادي السائد في دولة الكويت قبل الغزو العراقي الغاشم والوضع الاقتصادي الحالي لتقييم أثر الغزو الاقتصادي بعد 26 سنة من التحرير. تشير أهم نتائج الدراسة إلى استمرار الاعتماد المفرط لدولة الكويت على النفط لتمويل الإيرادات العامة، فبالرغم من تحقيق الكويت فوائض مالية ضخمة خلال العشر سنوات الماضية إلا أن عدم قدرة الاقتصاد على تنوع الصادرات عزز استمرار الخلل في هيكل الأنشطة الاقتصادية.

التطور التاريخي لفائض الموازنة لدولة الكويت خلال الفترة 2007-2014 (بالمليار دينار)



المصدر: وزارة المالية

النتائج:

- أظهرت الآثار الاقتصادية للاحتلال العراقي عدة نتائج كارثية على الاقتصاد المحلي، ولكن لا تزال تداعيات تلك الآثار مستمرة إلى وقتنا الحاضر والمتمثل بتأخر تحسين برامج الإصلاح الاقتصادي في البلاد، وقد أوضحت النتائج الحقائق الاقتصادية التالية:
- نمو حجم الاقتصاد الكويتي بنسبة 470% من عام 1989 إلى عام 2014 وتحديداً يعكس هذا النمو بشكل أساسي مساهمة القطاع النفطي في الانتاج في إشارة واضحة على بقاء الهيكل الانتاجي باقتصاد الدولة كما هو من قبل الغزو العراقي.
- سجلت الكويت نسبة مساهمة الصادرات النفطية لإجمالي الصادرات تقدر بنحو 90.7% في عام 1989 مقارنة بنحو 93.6% في عام 2014، وهذا مؤشر على استمرار اعتماد الكويت على الصادرات النفطية كمصدر أساسي لتحقيق معدلات نمو للاقتصاد.
- استمرار الاعتماد المفرط على النفط لتمويل الإيرادات مما يجعل الكويت عرضة لتقلبات اسعار النفط مقارنة بالفترة السابقة للغزو.
- وجود استقرار في سعر صرف الدينار الكويتي خلال الفترة الممتدة من قبل الغزو العراقي الغاشم إلى وقتنا الحاضر.

الخاتمة والتوصيات:

- رغم طول الفترة المنقضية بعد الغزو الغاشم لا تزال هناك اختلالات واضحة في الاقتصاد الكويتي تتطلب العمل على تسريع تنفيذ برنامج إصلاح اقتصادي شامل وهدف يسعى لتعزيز التكامل بين القطاعات الاقتصادية المختلفة في الاقتصاد الكويتي، وتتمثل أهم تلك الاختلالات بالاعتماد على مصدر وحيد للدخل، ومخاطر المالية العامة، والخلل في سوق العمل، وهيمنة القطاع العام على الأنشطة الاقتصادية.
- استناداً إلى نتائج الدراسة تم التوصل إلى بعض التوصيات الهامة التي تجد سياقها الرئيسي أهمية وضع استراتيجية عامة لتعزيز تنافسية الاقتصاد الكويتي، وتتمثل الاستراتيجية بتحديد التوجهات الرئيسية التالية:
- تشجيع التوسع في القطاعات ذات القيمة المضافة من خلال إعادة توجيه الموارد الاقتصادية وإتباع خطة إصلاح اقتصادي شاملة.
- توسيع مصادر الإيرادات العامة للدولة بعيداً عن التقلبات السريعة لأسعار النفط.
- تحسين الوضع التنافسي لدولة الكويت من خلال التسريع في عملية الخصخصة.

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تمهيد:

لقد مر الاقتصاد الكويتي بأوضاع صعبة وحرجة خلال فترة الاحتلال العراقي الغاشم في الثاني من شهر أغسطس في عام 1990، هذا ولا يوجد أدنى شك بأن الأضرار النفسية والمعنوية والاجتماعية والاقتصادية والسياسية شكلت الجوانب الأساسية لآثار الغزو الغاشم على دولة الكويت، فقد أحدث الغزو العراقي الغاشم اضراراً بالغة بجميع قطاعات الاقتصاد الكويتي بسبب ما تعرض له من سلب ونهب ودمار شامل للبنية الأساسية في الدولة أدت إلى تحجيم قدرات الاقتصاد المحلي من ثروات نفطية وموارد اقتصادية ومقومات تنموية. هذا وتقدر الأمم المتحدة في تقرير لها بأن خسائر دولة الكويت جراء الغزو العراقي الغاشم يفوق 23 مليار دولار امريكي، وأفاد تقرير الأمم المتحدة بوجود تدمير وخراب شامل لمرافق قطاع الكهرباء وقطاع الاتصالات الهاتفية وقطاع النقل العام، كذلك فالبنية التحتية أصبحت غير صالحة للاستخدام، والمباني والمؤسسات العامة بالدولة قد تدمرت بشكل كبير.

هدف الدراسة:

الهدف الأساسي من الدراسة تحليل البيئة الاقتصادية لدولة الكويت وقياس الأثر الاقتصادي للغزو العراقي الغاشم على دولة الكويت واقتراح الحلول المناسبة.

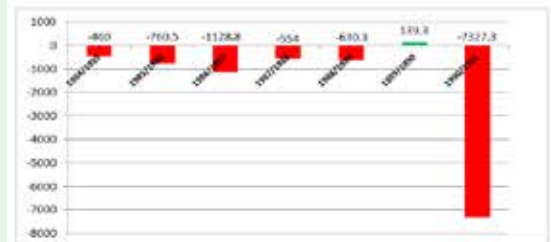
المنهجية:

تعتمد الورقة بشكل أساسي على تحليل الأثر الاقتصادي للغزو العراقي باستخدام الأسلوب التحليلي المقارن والذي يقوم على تحليل وضع الاقتصاد الكويتي من خلال تقييم نقاط القوة التي تتمتع بها الكويت ونقاط الضعف التي تعاني منها، وذلك بعد مرور 26 سنة على الغزو العراقي، بهدف تقييم فرص تحسين تنافسية الاقتصاد الكويتي.

أبرز ملامح الاقتصاد الكويتي - مقارنة بين عامي 1989 و 2014

البيان	1989	2014
حجم انتاج النفط (مليون برميل يوميا)	1.5	2.8
مساهمة الكويتيين إلى إجمالي القوى العاملة	14 %	19.5 %
مساهمة الوافدين إلى إجمالي القوى العاملة	86%	80.5%
مساهمة القطاع النفطي إلى الناتج المحلي الإجمالي	39%	60%
مساهمة الصادرات النفطية إلى إجمالي الصادرات	90.7%	93.6%
نصيب الإيرادات النفطية إلى إجمالي الإيرادات العامة	90.8%	92.1%
الناتج المحلي الإجمالي الحقيقي (مليون دينار)	8,178	38,477

التطور التاريخي لعجز الموازنة لدولة الكويت خلال الفترة ما قبل الغزو (بالمليون دينار)



المصدر: بنك الكويت المركزي



FDI and Economic Growth in the Arab Region: The Case of Knowledge Spillover Effects

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Abstract

This research aims to focus on how institutional barriers in the Arab region may account for losses in FDI inflows along with their potential technology spillover effects, as well as to show how the deficiency of absorptive capacities serve as an important factor for attracting inflows. The analysis relies on endogenous growth models at an aggregate regional level and a microeconomic firm-level. Findings based on linear OLS regressions, reveal a positive correlation between improved institutional factors and potential FDI spillovers, with significance varying in certain countries. Policy implications involve having targeted FDI policies to enhance absorptive capacities, improving information asymmetry to reduce corruption, and enhancing the labor market regulatory framework to improve human capital development as an incentive for FDI inflows.

Introduction

Foreign direct investment is key contributor to economic growth, both explicitly and implicitly. Investment is a major factor to boost economic growth, however, with FDIs also lead to positive externalities that additionally increase growth levels through their technology spillover effects. When FDIs flow inwards towards a host economy, they also transmit their knowledge and technology. This therefore boosts GDP levels as well as human capital development, and may induce further local innovation. These externalities (that the literature most often refers to as "spillovers") emphasize the importance of giving enough recognition to the potential of FDIs as sources of economic growth.

Objectives

- ❖ FDI levels have been recently declining in the Arab region; what factors might play a role in this decline?
- ❖ May institutional factors in the Arab region act as a hindrance towards FDI spillovers from reaching their full potential?

Methodology

The main approach in analyzing the impact of institutional factors on FDI spillovers is to divide the analysis into two levels; an aggregate, macroeconomic regional-level analysis, and a microeconomic firm-level analysis, based on the concepts explored in new endogenous growth theories.

➤ Regional-level Model:

$$IndVA = \alpha + FDI + GR + LP + GCF + Trade + InstF + \varepsilon$$

- Endogenous Variable: *IndVA* industry value added as a proxy of FDI spillovers
- Exogenous variables: *FDI* net inflows, *GR* growth, *LP* labor productivity, *Trade* annual trade, *InstF* institutional factors

➤ Firm-level Model:

$$NS_{ij} = \alpha + FDI_{ij} + LP_{ij} + FC_{ij} + InstF_{ij} + \varepsilon$$

- Endogenous Variable: *NS_{ij}* net sales as a proxy for firm-level FDI spillovers
- Exogenous variables: *FDI_{ij}* foreign firm ownership, *LP_{ij}* labor productivity, *FC_{ij}* fixed capital, *InstF_{ij}* institutional factors

Results

❖ Regional Analysis Regression analysis below, which resembled similar outcomes in the firm-level analysis.

Variables	Coef.	Std. Err.	t	P>t
FDI	2.90E-10	1.13E-10	2.57	0.012
GR	0.2081814	0.2555394	0.81	0.417
GCF	0.0281398	0.1518185	0.19	0.853
Trade	-0.2765657	0.0391606	-7.06	0.000
LP	0.00151	0.0001397	10.81	0.000
Regulatory Quality	0.3911266	0.0645759	6.06	0.000
_cons	13.12441	3.937303	3.33	0.001

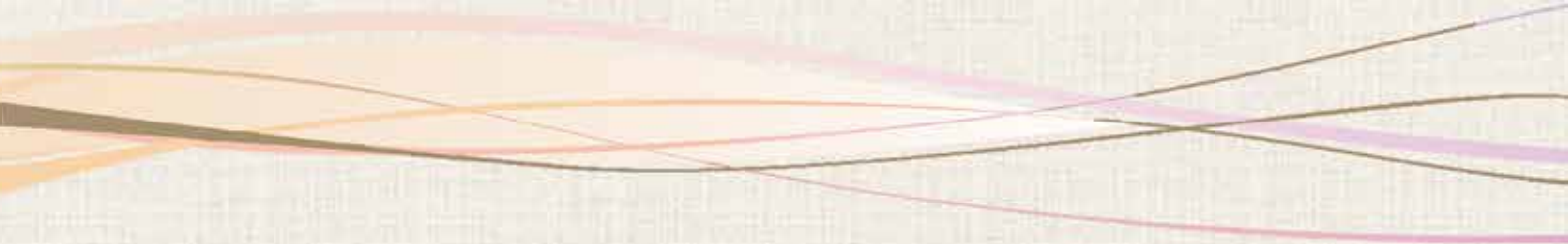
Conclusions and Suggested Policies

- ❖ Our analysis showed that both at regional and firm-level perspective, the institutional constraints are a major factors to consider; variances in significance differ from one country to another.
- ❖ Policies should be oriented towards fighting corruption and enhancing investment climates.
- ❖ Future studies include a larger sample size, comparing intra-industry data results, looking into factors other than the institutional quality to analyze the impact on FDIs and spillovers.

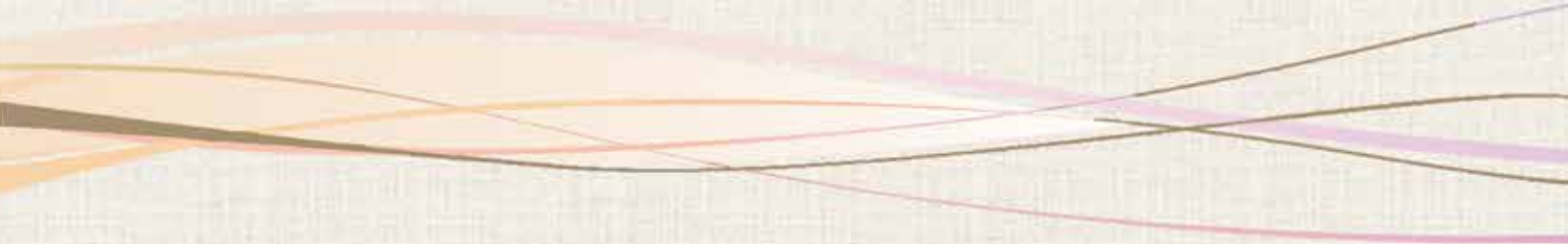
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العلوم الإدارية



عنوان الدراسة البحثية

(مبارك الصباح وخزعل الكعبي عوامل النجاح وتداعيات الانهيار - 1896- 1915م - دراسة مقارنة)

المؤلف - عبدالله محمد الهاجري

القسم | الكلية - كلية الآداب - قسم التاريخ



خاتمة الدراسة

إن كان خزعل يتحمل جزءاً من ضياع إمارة عربستان إلا أنه لا يمكن أن ننكر أن التسدخات السياسية الدولية والصراع الاستعماري بالمنطقة كان العامل الأقوى في تطور الأوضاع وما آلت إليه في النهاية ، خصوصاً بعدما خرجت الدولة العثمانية من المعادلة إثر هزيمتها في الحرب العالمية الأولى ، كما أننا يجب ألا نهمل أن صراع القوى الداخلية في عربستان وعدم وجود رغبة من قوى القبائل المختلفة في الانضمام تحت عباءة الشيخ خزعل قد يكون هو ما عجل بعملية السقوط ، على العكس من الكويت التي كان الوضع الداخلي فيها ينعم بقدر كبير وواضح من الاستقرار والالتفاف حول القيادة الممثلة في الشيخ مبارك . إن خزعل الذي كان في أغلب فترات حكمه مشغولاً في الصراعات الداخلية مع القبائل المختلفة في إمارته لم يدرك إلا متأخراً نتائج هذه الصراعات ، وبخاصة بعد الحرب العالمية الأولى التي وجد نفسه مضطراً بعدها للاعتراف بسلطة طهران ، وترسيخ وجودها، وبناء مصالح لها فوق أراضيها ، على عكس مبارك الذي رفض إعطاء أي دولة باستثناء بريطانيا حجة أو مصلحة يمكن من خلالها النفاذ إلى أراضي الكويت أو وضع قدم لها فيها، لقد استقر وضع الكويت في نهاية المطاف كإمارة تنعم بسيادة وضمادات معقولة في فترة من أخرج فترات التاريخ الحديث والتقلبات والصراعات الدولية في عهد الشيخ مبارك ، في حين سقط حكم الشيخ خزعل رغم تماثل الأوضاع والظروف، وتسنى لنظام طهران السيطرة التامة والكاملة على إمارة عربستان.

مقدمة الدراسة

شكل الشيخ مبارك الصباح (1896- 1915) في الكويت، والشيخ خزعل الكعبي (1897- 1925) م في عربستان محورا سياسيا وإقليميا فاعلا ومؤثرا في فترة مهمة من التكوين السياسي لمنطقة الخليج العربي منذ نهايات القرن التاسع عشر وحتى الربع الأول من القرن العشرين، ونظراً للدور التاريخي الذي لعبه كل من الشيخين والتشابه في ظروف وملابسات تولي الحكم وتعرضهما لنفس الضغوط الخارجية على إمارتيهما ، حاولنا من خلال هذه الدراسة المقارنة أن نكشف دور وواقع تعامل كل منهما مع هذه الضغوط وكيف كانت نتائجها على السياسة الخارجية لإمارتيهما وما أدت إليه.

أهداف الدراسة

هدفت الدراسة بشكل مباشر :
لمناقشة وتحليل المحاور التالية :
أولا طبيعة وشكل السلطة بالكويت والمحمرة بعد تولي مبارك وخزعل سدة الحكم في إمارتيهما .
ثانيا: تطور الأوضاع الداخلية في الكويت والمحمرة إبان توليها الحكم .
ثالثا: مبارك وخزعل والقوى المحيطة:
رابعا: اتفاقية الحماية 1899م على الكويت وفشل خزعل في الحصول على اتفاقية مماثلة:
خامسا: أسباب ربط خزعل قرارة السياسي بيد بريطانيا ومحاولة مبارك الانفلات من فلك السياسة البريطانية
سادسا: استقرار الكويت ونهاية عربستان
سابعا: أسر خزعل ووفاته بطهران 1936م

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نتائج الدراسة

تبرز الدراسة في النهاية حقيقة أن التكوين السياسي وطبيعة الحكم المستقر وعدم وجود صراعات قبيلة في الكويت تحت قيادة الشيخ مبارك الصباح كان العامل الرئيس في استقرار وترسيخ دعائم الحكم له في الكويت ، على عكس وضع الشيخ خزعل في عربستان الذي عانى من مشاكل وصراع داخلي وقبلي شديد ، كذلك بينت الدراسة أن مبارك استطاع أن يخلص إمارته من الأخطار الخارجية في ظل تعقيدات اللعبة السياسية والضغوط الخارجية واستطاع أن يكون صورة واضحة عما يجري لضمان قدر معقول من الأمان له وإماراته، كان هناك في مقابله الشيخ خزعل الكعبي الذي فشل في استخدام الممكن والمتاح للوصول بإمارته إلى بر الأمان أو حفظ سيادتها



عنوان الدراسة البحثية
دراسة نقدية في منهجية ومضمون النص التاريخي لكتاب تاريخ الكويت لمؤلفه « عبد العزيز الرشيد »
المؤلف - عبدالله محمد الهاجري
القسم | الكلية - كلية الآداب - قسم التاريخ

احصائيات :

كلمات وعبارات وردت بشكل موسع في كتاب الرشيد	هذا ما يقوله البعض - قال - يقول - يقول هؤلاء - آخرون- قيل - يقال - فقبل-فيقال- ما يقوله البعض - منهم من يقول - تناقل - يحكى - سمعت - يروي- حكى- منهم من يرى-روي- بعض الخبيرين
عدد أبيات الشعر في الجزء الأول من الكتاب	ألف وخمسة وثمانون بيتاً شعرياً
عدد أبيات الشعر في الجزء الثاني من الكتاب	مائتان وواحد وسبعون بيتاً شعرياً

خاتمة الدراسة:

لاشك أن العرض التاريخي عند الرشيد كانت تنقصه الرؤية المنهجية الواضحة ، على الرغم من أن الرشيد أتاحت له فرصة مهمة وهي دعم السلطة له وتزويده بما يريد من وثائق وسجلات ومراسلات، إلا أن الاستفادة القصوى مما أتيج له قد تكون شابهها بعض القصور وعدم الدقة ، لكن ذلك لم يمنع من أن يخرج في النهاية المؤلف كصورة مرتبطة بواقع ، لا نكاد نتلمس من خلاله أيديولوجيات منفصلة عن أوضاع عاشتها الكويت وارتبطت بها ، وسيظل كتاب "تاريخ الكويت" الكتاب الأبرز في تاريخ الإمارة فهو عصاره ذلك التكوين المتشابك كله ، وهذا بلا شك التاريخ في عمق مغزاه.

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مدخل الدراسة :

دراسة أي نتاج فكري- تاريخياً كان أم أدبياً- تستوجب وضعه وربطه بالحقبة التاريخية التي ينتمي إليها هذا الجهد العقلي ، والواقع أن أهم من تصدى لكتابة تاريخ الكويت الحديث والمعاصر (المؤرخ والأديب الكويتي عبد العزيز الرشيد) ، حيث كان أول من دون تاريخها في مؤلف واحد هو كتاب "تاريخ الكويت" ، والذي أجمع المؤرخون والباحثون على الأهمية الكبرى لمؤلفه بل وذهب البعض للقول بأن **«أي باحث لا يستطيع الاستغناء عما ورد فيه»** كما مثل الرشيد بكتابة هذا أولى مراحل التدوين الرسمي لتاريخ الإمارة ، لكن...على الرغم مما عرف عن الكتاب من أهمية ، إلا أنه وبعد مضي ما يقارب التسعون عام ، نجد أن كتاب تاريخ الكويت اكتسب شكلاً جديداً من أشكال المؤلفات التوثيقية ، بعد أن استطاع الرشيد فيه الحفاظ على الذاكرة الوطنية المحلية ، متناولاً أهم الأحداث والوقائع والروايات بجهد يكاد يكون فردياً ، فأصبح الكتاب وثائق تاريخية مدونة، استخدمها الباحثون والمؤرخون فيما بعد للاستشهاد والاستدلال وتدعيم ما كتبوا، غير أنه ... وفي ظل ظهور شواهد تاريخية ظهرت لاحقاً سواء (مراسلات ، أو برقيات، أو كتب ، أو مؤلفات رسمية أجنبية وعربية) ، أصبح من الواجب التعامل مع المعرفة التاريخية المرصودة في كتاب (تاريخ الكويت) بمنهج نقدي / إشكالي - يسائل النص والخبر ، والرواية وذلك لإعادة استحضار وبناء وقائع الماضي في سياق تصور الزمن التاريخي السليم للحدث ، لنصل من خلاله لحقائق مقارنة و بشكل دقيق ومنظم من خلال مستويات منهجية علمية (كـ التفسير، والتحليل، والتأويل، والنقد، والتركيب).

نتائج الدراسة:

- ظهر واضحاً عدم اعتماد الرشيد لمنهجية معينة في مؤلفه كتاب تاريخ الكويت، مع غياب استخدام منهج علمي موحد لمجمل وقائع وأحداث ومواضيع وروايات الكتاب.
- الكثير من مفردات وألفاظ الكتاب تميل بالقارئ نحو الطابع البلاغي والأدبي بالإضافة لتوسع الرشيد في الاعتماد على المجاهيل وقلة التوثيق بالمصادر.
- ظل الطابع الإشراقي والديني في الكثير من الأوقات هو الغالب بجانب العبارات والألفاظ الجزلة والعامية ، بل والجنوح في حالات قليلة جداً وفي سابقة تاريخية للوصف بأوصاف وألفاظ شديدة التجريح كـ(دعى زنياً) غباوتة)
- فقدت الرواية التاريخية عند الرشيد أجزاء مهمة تمثلت في الاعتماد فقط على الرواية المحلية أو الشفوية ، مع غياب قراءة الحدث بكافة متغيراته ودوافعه خاصة الدوافع السياسية على الرغم من أنه صرح بالقول «لا قيمة للتاريخ بدون الرسمية».
- مبالغة الرشيد في الاعتماد على الرواية الشفوية خلق نوعاً من تماهي النص التاريخي مع النص الشفهي دون تحديد دقيق لعلاقة الحدث بأبيهما ، والتي قد تكون أدت في بعض الأحيان لغياب عملية التحقيق والضغط
- ابتعاد الرشيد عن انتقاد السياسة البريطانية ، والابتعاد عن ملامسة جوانب مهمة مثل الحديث عن الأوضاع السياسية بشكل عام في فترة الشيخ أحمد الجابر وعلاقته ببريطانيا ، والابتعاد بشكل خاص توجيه انتقاد لارتهان بريطانيا للقرار السياسي الخارجي بيدها خصوصاً في معاهدة العقير ، باستثناء ذكره بالقول " بريطانيا ذات الطمع في الخليج
- كذلك ظهر واضحاً عدم اهتمام الرشيد بشمولية تاريخ المنطقة من قيام ممالك وسقوط إمارات ودول (كالدولة السعودية الأولى والثانية والثالثة على سبيل المثال) بالإضافة لتجاهله لأسباب للتوسع الاستعماري وصراع القوى الطامعة بالمنطقة وأثر ذلك على الكويت .



Translating Hedging From English into Arabic in Academic Discourse

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Abstract:

Hedging is a rhetorical element that permits an academic writer to mark his or her epistemic stance that influences writer-reader relationship. However, when writer-reader communication crosses linguistic and cultural boundaries, translation plays a central role to bridge the communication. Research into the translation of English hedges to other languages has been carried out for some time; however, little attention has been given thus far to the translation of English hedges into Arabic.

Objectives:

The present study is an attempt to fill a gap in knowledge, aiming to explore the translation of English hedges into Arabic in academic discourse by:

- 1- Identifying English hedges in academic discourse in the fields of linguistics and philosophy according to Hyland's model of hedging.
- 2- Examining the Arabic equivalent texts to identify the most frequent translation strategies used by translators in rendering hedges.

Methodology:

Data:

The sample of this study is comprised of two sets: the English data and the Arabic data. The English data includes ten book chapters that have been previously published in the fields of Linguistics and Philosophy. Five chapters are selected from each field based on the availability of their translation into Arabic. The Arabic data is comprised of the published Arabic translations of the English chapters. The English data is comprised of 64,069 words (36,155 words from linguistics texts and 27,914 words from philosophy texts), while the Arabic data is comprised of 63,510 (39,327 words from linguistics and 24,183 from philosophy).

Procedures:

The analysis of the data has been carried out in different stages. First, Hyland's (1998) model of hedges in English academic discourse has been adopted to trace the frequency of the hedged expressions in the English data. In this model, English hedges are identified by their grammatical categories: modal auxiliaries, lexical verbs, adverbs, adjectives and nouns. A software called 'Word Smith' has been used to calculate the frequency of each hedging device in the English corpus to approximate their occurrence in English academic discourse. The Arabic data is then examined manually to study the equivalences of the English hedges in Arabic and to see how translators address hedged expressions through various translation strategies.

The analysis:

English hedges have been studied to figure out the frequency of their occurrences in English academic discourse mainly in two disciplines: linguistics and philosophy. Then, the equivalent translated texts into Arabic have been examined to see the strategies adopted by Arabic translators to rendering this rhetorical device into the target language.

Results:

Data analysis revealed that hedges were frequently used in the English data. This is perhaps due to the fact that linguistics and philosophy fall under the humanities. The use of particular hedging devices appears to differ slightly between the two disciplines. The analysis shows a widespread use of modal auxiliaries, which have the highest frequency among all hedges. This result could be attributed to the characteristics of modal auxiliaries, whose function is to show degrees of certainty and obligation. Lexical verbs and lexical adverbs are the second most frequently used hedging devices, followed by lexical adjectives. In addition, since translation is assumed throughout this research to be a process of converting linguistic expressions and messages from one language to another by means of providing the semantic equivalences, seeking the appropriate linguistic/cultural equivalency may be challenging for some translators and indeed poses a serious challenge for translators dealing with two unrelated languages such as English and Arabic. However, translators utilized only three strategies, amongst several strategies, when rendering English hedges into Arabic. These translation strategies were literal translation, deletion, and domestication. In fact, in these cases there was no apparent difficulty in understanding the intended meaning of the English hedges and hence the translators were able to convey that meaning in Arabic using direct equivalent.

Table 1: Distribution of Hedges in Linguistics and Philosophy in the English Corpus

Discipline	Hedging Device	Frequency
Linguistics	Modal Auxiliaries	584
	Lexical Verbs	308
	Adverbs	140
	Adjectives	30
	Nouns	5
		1067
Philosophy	Modal Auxiliaries	467
	Lexical Verbs	126
	Adverbs	103
	Adjectives	42
	Nouns	10
Total		748

Table 2: Strategies Adopted to render English Hedges into Arabic

Discipline	Strategies	No. of Occurrences	Percentage
Linguistics	Literal Translation	229	18%
	Deletion	52	14%
	Domestication	21	6%
Total		302	100%
Philosophy	Literal Translation	228	77%
	Deletion	77	20%
	Domestication	10	3%
Total		315	100%

Recommendations:

- The study suggests that future research in Arabic studies must be done to explore hedges in different disciplines—both soft and hard sciences.
- Examining more comparative studies between Arabic and other languages.
- Conducting experiments by employing different participants, such as Arabic translators and academics both professors and students, to observe whether these subjects understand the concept of hedging and therefore managing the strategies on how to translate them.

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للكتليات الإنسانية
21 مارس 2016
قطاع الأبحاث

المقدمة

استمر قطاع الأبحاث في دورته السنوية الخاصة بإقامة فعاليات الملصق العلمي للعام الأكاديمي 2016/2015، حيث يوفر منبراً متميزاً يستطيع أعضاء هيئة التدريس من خلاله عرض أحدث منجزاتهم البحثية في أجواء من الانفتاح العلمي وتبادل الخبرات والآراء. وينظم القطاع سنوياً حدثين منفصلين للكليات الإنسانية، وللكتليات العلمية، ويتمثل الهدف من هذه الفعالية في جمع الباحثين من مختلف التخصصات لتقديم أبحاثهم الجارية والمستكملة في بيئة تشجع الحوار العلمي، وتبادل الآراء والاهتمامات، بينما تمهد السبل نحو بروز الأفكار الجديدة وتناول المجالات التي لم يسبق تناولها بحثياً. ويدفع هذا الهدف بقطاع الأبحاث نحو التشجيع الدائم لمشاركة جميع الكليات في فعاليات الملصق العلمي، وبتزايد عدد المشاركين سنوياً من أعضاء هيئة التدريس، ومساعدتي التدريس، وطلبة الدراسات العليا في تقديم نشاطهم البحثي المتميز وعرضه على جمهور من الباحثين والخبراء للاستفادة من آرائهم وملاحظاتهم. لذلك، يستمر هذا الحدث السنوي بالاستحواذ على اهتمام باحثي الكليات، حيث يحقق في كل عام طموح قطاع الأبحاث بشأن جذب المزيد من الباحثين من جميع الكليات للمشاركة في فعالياته، مما يحقق لإنجازاتهم العلمية والبحثية انتشاراً واسعاً.

وفي هذا العام، تقدم كليات الإنسانيات والعلوم الاجتماعية مجالات متنوعة من الاهتمامات البحثية لأعضاء هيئة التدريس خلال العام 2016/2015 بعرض 60 ملصقاً علمياً سجلت نمواً بنسبة 100% بالمقارنة مع عدد ملصقاتها في العام الماضي (30 ملصقاً). وقد جمع الحدث 6 كليات هي كلية الآداب (3 ملصقات)، وكلية العلوم الإدارية (15 ملصقاً)، وكلية التربية (12 ملصقاً)، وكلية الحقوق (3 ملصقات)، وكلية الشريعة والدراسات الإسلامية (10 ملصقات)، وكلية العلوم الاجتماعية (17 ملصقاً). وقد افتتح أ.د. حسين الأنصاري، مدير جامعة الكويت، فعاليات الملصق التي استضافها أ.د. طاهر الصحاف، نائب مدير الجامعة للأبحاث، بحضور مساعديه أ.د. يوسف قراشي، ود. ليلي معروف، وأ.د. حيدر بهباني، وعمداء الكليات المشاركة وعمدائها المساعدون، إلى جانب حضور العديد من المسؤولين في جامعة الكويت والمشاركين من الكليات، حيث أقيم الحدث في مسرح الشيخ عبدالله الجابر في موقع الشويخ بتاريخ 21 مارس 2016.

ويجمع هذا الإصدار الملصقات المشاركة في فعالية هذا العام والمكونة من 60 ملصقاً علمياً من 6 كليات في مجال الآداب والإنسانيات والعلوم الاجتماعية. ويشارك في الحدث أعضاء هيئة التدريس، ومساعدتي التدريس، وطلبة الدراسات العليا، مما يقدم الإنجازات المتميزة لأبحاث الإنسانيات والعلوم الاجتماعية في جامعة الكويت. وقد تناولت الملصقات القضايا المعاصرة، والحقائق حديثة الظهور على المستويين الوطني والاجتماعي، حيث فتحت هذه المواضيع الأبواب للباحثين للنقاش والحوار وتبادل الآراء حول الأفكار والمفاهيم الجديدة لإنجاز الأبحاث المتقدمة والمبتكرة.

ويشكل هذا الهدف الإستراتيجية الجديدة التي يتبناها قطاع الأبحاث بشأن توفير بيئة ملائمة لأعضاء هيئة التدريس للتعاون في إنجاز الأبحاث المشتركة ذات الجودة العالية والقيمة العلمية المتميزة عبر تطوير الصلات بين المجالات العلمية المتنوعة وتيسير تحقيقها للأبحاث والدراسات الشاملة عالية الجودة. ومع النجاح المتواصل لفعالية الملصق العلمي على مدى الأعوام السبعة الماضية، يتطلع قطاع الأبحاث لترسيخ ثقافة الإبداع والابتكار العلمي في جميع الكليات، مما سيفتح آفاقاً جديدة من الوعي العلمي بضرورة تحقيق أفضل المستويات في الأبحاث المؤسسية.

ومع وضع هذه الغاية نصب الأعين، جذب الحدث لهذا العام مشاركة أكبر في عرض الإنجازات البحثية، مع تميزه المعهود المتمثل في تقديم قطاع الأبحاث للجوائز الخاصة بأفضل الملصقات العلمية. ويتم تقييم جميع الملصقات من قبل لجنة مكونة من نخبة من الاساتذة لاختيار أفضل ثلاثة ملصقات علمية تحت الفئات الثلاث المشاركة في عرض أبحاثها من أعضاء هيئة التدريس، ومساعدتي التدريس، وطلبة الدراسات العليا.

ويقدم هذا الإصدار جميع الملصقات المشاركة في فعالية العام 2016 لكليات الإنسانيات والعلوم الاجتماعية، مما يوفر مرجعاً عملياً للكليات والباحثين المهتمين بالاستفادة من الموضوعات العلمية التي تناولها الملصقات في تطوير أفكار جديدة، واستكشاف آفاق متطورة للأبحاث المبتكرة متعددة التخصصات.



يوم الملصق العلمي للكليات الإنسانية، 21 مارس 2016

الآداب، العلوم الإدارية، التربية، الحقوق، الشريعة والدراسات الإسلامية، والعلوم الإجتماعية

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تحتفظ جامعة الكويت بالحقوق الخاصة لهذا الإصدار، ولا يسمح بنسخ أي جزء منه إلا بترخيص مسبق من مكتب نائب مدير الجامعة للأبحاث، جامعة الكويت. صندوق بريد 5969، الصفاة، 13060، الكويت.



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