THE IMPACT OF LEADERSHIP STYLE ON INNOVATION IN IRAQ'S HIGHER EDUCATION INSTITUTIONS: THE ROLE OF KNOWLEDGE SHARING

by

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The Impact of Leadership Style on Innovation in Iraq's Higher Education Institutions: The Role of Knowledge Sharing

Sawasn Jawad Hussain Al-husseini

Abstract

Today, the higher education sector in developing countries is facing challenges from a dynamic environment characterised by rapid technological change and increased demand. As innovation becomes critical to the survival of organisations, transformational leadership (TL) has been found to have an important influence on innovation, leading to increased goal-directed behaviour on the part of followers, promoting organisational change, and a spirit of trust, and helping followers to exceed their performance expectations.

Knowledge and knowledge sharing are recognised as the most significant resources for competitive advantage and the key to enhancing innovation. It has been shown that knowledge management and the promotion of knowledge sharing among the members of an organisation are an important part of the learning process as they help to convert the tacit knowledge embedded in individuals into explicit knowledge through interaction. Prior literature has pointed out that transformational leadership is one of the most important factors affecting knowledge sharing and enhanced innovation in an organisation. However, there is a lack of models linking transformational leadership, knowledge sharing, and innovation within higher education institutions (HEIs) in general within developing countries, particularly Iraq.

This study sought to examine the impact of transformational leadership on innovation through the mediating role of knowledge sharing, and the differences between these impacts in public and private HEIs in Iraq. A mixed-methods approach was taken (quantitative and qualitative) and 486 (253 public and 233 private) valid responses were collected to test the causal relationships between transformational leadership, knowledge sharing, and innovation. Then, 10 interviews were conducted with the leaders of HEIs to explain the unexpected findings from the quantitative stage regarding the differences in transformational leadership practice and the effect relationships. Employing structural equation modelling (SEM) with AMOS 20, the study found that knowledge sharing plays a pivotal role in the relationship between transformational leadership and innovation, and that transformational leadership would be ideal in an educational context, promoting knowledge sharing activities and influencing innovation in both the public and the private sector. The multi-group SEM and

the interviews revealed similarities and differences between Iraqi public and private HEIs in terms of the effect relationships.

The findings contribute significantly to the theory on the mediating role of knowledge sharing in supporting the relationship between transformational leadership and innovation. They also provide a better understanding of these relationships in the educational environment within developing countries, specifically Iraq, a context that has been neglected in previous studies. The study has further detected sector-based differences, and similarities in terms of the transformational leadership exhibited, and has provided a clearer picture of the status of the HEI system in Iraq. Regarding practical implications, the findings show that leaders in higher education who are looking to establish strategies for achieving innovation would benefit from expending their efforts on promoting knowledge-sharing practices among their teaching staff.

DEDICATION

To my father and mother

To my brothers and sisters

You made me who I am and made my dream come true

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List of Abbreviations

Abbreviation	Full term
TL	Transformational leadership
ID	Idealised influence
IM	Inspirational motivation
IS	Intellectual stimulation
IC	Individualised consideration
K	Knowledge
KS	Knowledge sharing
KD	Knowledge donating
KC	Knowledge collecting
PD	Product
PC	Process
KM	Knowledge management
HEIs	Higher education and initiations
MOHESR	Ministry of higher education and scientific research
FTE	Foundation of Technical education
SEM	Structural equation modelling
AMOS	Analysis of moment structures
ML	Maximum likelihood
χ^2	Chi-square
RMSEA	The root mean square error
CFI	Comparative fit index
NFI	Normed fit index
TLI	Tucker-Lewis index
PNFI	Parsimony normed fit index
AVE	Average variance extracted
α	Cronbach alpha
CR	Composite reliability
EFA	Exploratory factor analysis
CFA	Confirmatory factor analysis
SPSS	Statistics Predictive Analytics Software
MCFA	Multi-group Confirmatory factor analysis
MSEM	Multi-group Structural equation modelling
SMC	Square multiple correlation
MOUs	Memorandum of Understandings (MOUs)

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Author's Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Committee.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

The higher education sector today are facing global challenges from the rapid technological change and increased demands of today's world (Mathew, 2010). Academic institutions need to develop their abilities and respond to these demands like business organisations (Kim and Ju, 2008). Obendhain and Johnson (2004) pointed out that higher education institutions (HEIs) are important as they are producers of innovation, as a result of creating products and services. It is argued that the academic experience of the staff members represent the key knowledge of HEIs and it can be said that this is the main competitive resource of such institutions (Maponya, 2005). Colleges, technical institutions and universities function as suppliers of training, expertise, and personnel to industries (Fullwood et al., 2013). It is said that academic institutions play an important role in promoting and sustaining economic booms through their research, KS, and creation of a skilled graduate workforce (Maponya, 2005). It is believed that HEIs contribute entrepreneurial graduates who will drive economic growth forward through their projects in the knowledge economy (Kim and Ju, 2008, Jones, 2000).

HEIs can maximise their impact on the community and the wider society (Kim and Ju, 2008). They can play a critical role in knowledge transfer through working with other organisations to support innovation and solve their problems (Fullwood et al., 2013). Galang (2010) argued that HEIs have the ability to change the world through training, researching answers to challenges and informing public policy. Academic institutions are known to be knowledge-intensive environments in which KS forms one of the daily activities and in which individuals are the foundation of learning and research (Fullwood et al., 2013). Universities have helped

to transform societies by educating decision-makers, leaders, and academics (Amin, 2006, Lozano, 2006, Lozano et al., 2013). Higher education of a good quality is a source of great potential for the cultural development of a country (Kumar et al., 2013). Tian et al. (2009) argued that universities and research centres constitute social academic communities that play a vital role in creating and transmitting scientific knowledge, which is the main source and driver of societal progress and development.

As innovation becomes critical to the survival of organisations and a key factor in achieving competitive advantage, leadership style has been identified as the most important factor affecting innovation because leaders can influence the introduction of ideas, set specific goals and create a culture for innovation (Sarrors et al. 2008).

Although many styles have been studied in the field of management (Saenz, 2011), the most important is acknowledged to be transformational leadership (TL). This style leads to increased goal-directed behaviour exhibited by followers (Northouse, 2007, DuBrin, 2012) and thus to enhanced performance and innovation for the organisation (Yukl, 2013). Under transformational leadership, the followers feel respect, and trust towards the leader and are willing to do more than is expected of them. TL generates commitment from subordinates and produces a greater quantity of work and more creative problem solving (Northouse, 2007, Hawkins, 2011, Lynch, 2012, Yukl, 2013).

 Bass and Riggio (2012) stated that TL encompass four behaviours, namely idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. They explained that idealised influence expresses confidence in the organisational vision, instils admiration, and respect, and emphasises accomplishments. Under inspirational motivation, the followers are encouraged and impassioned by the goals of the organisation. Through intellectual stimulation, the leaders seek new methods of solving problems from the

followers, motivating them to questions assumptions, and encouraging imagination and creativity in rethinking old approaches. By practising individualised consideration, a leader can build interactive relationships with their subordinates and pay special attention to their needs.

Although TL may affect innovation directly, previous research has suggested that the direct effects may be too complex to isolate. It is recognised that knowledge is the most significant resource for competitive advantage (Nonaka, 2005, von Krogh et al., 2012, Nonaka et al., 2006) and the key to enhancing innovation (Saenz et al., 2009, Hislop, 2013). Knowledge is the primary production resource ahead of capital, labour and land (Drucker, 1993). It increases the effectiveness of the organisation, and its creativity and reduces risk and costs (Abell and Oxbrow, 2001). Organisations need to manage knowledge in order to enhance performance and survival prospects (Ahmed and Shepherd, 2010). According to the knowledge-based view, an organisation enhance its innovation if it owns and manages its tangible and intangible assets (Nonaka, 2005, Berggren et al., 2011, von Krogh et al., 2012). Knowledge management (KM) and its techniques are useful to accomplish organisational tasks (Charles, 2004). It can lead to better decision-making capabilities, and reduce product development cycle time (Jantunen, 2005).

KM include people, process, and technology (Massa and Tsesta, 2009). It involves the creating, sharing and using of knowledge (Andreeva and Kianto, 2011). It has been noted that, when considering the application of KM initiatives, it is important to create a culture of knowledge sharing (KS) (Uriarte, 2008, Hislop, 2009). KS includes activities in which information, skills, and insights are exchanged among organisational members (Kim et al., 2013).

The organisational value of an individual's knowledge increases when it is shared (Hislop, 2013). The promotion of KS among the members of an organisation is an important part of the learning process as it helps to convert the tacit knowledge embedded in individuals into explicit knowledge through interaction (Nonaka et al., 2006, Tchiijo and Nonaka, 2007, von Krogh et al., 2012). Halawi (2008) named KS as a main focal area for KM. Du Plessis (2007) explained that the fundamental aim of KM is to make KS the norm in the organisation. KS is considered a useful indicator for measuring the effectiveness of organisations (Tan et al., 2010). KS is considered to be a building block of efficient performance within higher education environments and to play a key role in enhancing the innovation of universities (Mathew, 2010). It is thought to be the foundation of learning and research at universities and a vital pillar of KM that is critical to academic innovation (Daud and Abdul Hamid, 2006). It is found that the use of KM techniques can lead to improved academic and administrative services and reduced product development cycle time (Kumar et al., 2013).

HE in developing countries like Iraq is also facing rapidly changing challenges that require extraordinary leadership (Herbst and Conradie 2011). The country is making great efforts to develop its human resources through education. The aim of its educational policy is to reorganise the education system and link education with its national development plans by emphasising scientific professional and technical studies (Sikhi, 2008), particularly since 1988 when private colleges were founded alongside the public universities to provide more opportunities for Iraqis to pursue HE within the country

In the past, the level of higher education in Iraq was advanced, making it the best in the Middle East and the countries of the Arab Gulf. In 1982, Iraq won the UNESCO prize for the best illiteracy-free country, especially due to the endorsement of a law on free education (UNESCO, 2004). Higher education in Iraq enjoyed government funding as well as funding by private individuals (Sikhi, 2008). This funding went towards the development of teaching,

the inception of research and projects, the development of educational services, curricula, laboratories, scholarships and training, all aimed at spreading knowledge in society. According to UNESCO report (2011), the education budget in 1989 was US-$2.5 billion, accounting for some 6 percent of the gross domestic product. Due to wars and the economic embargo imposed between 1991 and 2003, Iraq was distanced from the rest of the world, whilst government support for the teaching cadre in the areas of training and other relevant services weakened. As a result, there was a deterioration in the infrastructure and information technology of HEIs and the amount spent on the education of each student dropped from US $620 in 1989 to just US $47 in 2002 (UNSECO, 2011). In addition, the lack of security after 2003 forced many academics and scientists in all fields and specialisations to leave their universities, causing a brain drain away from the country.

According to a UNESCO report in (2003), the poor level of international contact among Iraqi professors from 1991 onwards had an adverse impact on Iraqi universities, so that they were no longer comparable to international universities. The report stressed the urgent need to regain the lost glory of educational institutions in Iraq. Educational markets are becoming increasingly global nowadays, and the ability of the education system in Iraq to reach a global market will depend on changes in the following areas: systems, methods, curricula, and leadership style. Iraqi public and private HEIs require unique rather than traditional leaders, as the latter cannot help them to compete in the present educational environment.

The Ministry of Higher Education and Scientific Research (MOHESR) has launched an international strategy for 2012-2020 regarding the reform of the HEIs (MOHESR, 2012). The Ministry has adopted a number of approaches and goals for upgrading higher education, stressing the need to achieve sustainable human development and strengthen the quality of higher education. National criteria have been set matching the high-quality criteria adopted internationally. Based on these criteria, the current strategy includes an effective work plan to

be implemented between 2012 and 2020 according to a timetable outlining actions, activities, and the parties responsible for the execution of each activity, as well as the deadline for completion, the indicators, and the expected results. This strategy comprises a number of the main axes, such as the development of curricula and study programmes (content, methods and technologies), encouraging creativity, and distinction in scientific research, and developing academics on all levels. It also includes upgrading the capabilities of the teaching staff in using technology for education and learning. (More details of this strategy will be given in the chapter four). This strategy will only succeed with the active participation of the leaders and academic staff from the various HEIs in Iraq.

Lin (2007) noted that understanding KS enablers, processes, and outcomes is highly necessary in organisations. Previous studies have linked TL with KS and innovation in isolation. For instance, in the case of innovation, Chen et al. (2012) found that transformational leaders can improve creativity and innovation within an organisation by motivating their followers and boosting their self-esteem. TL has the ability to encourage ideas that promote product innovation (Sosik et al., 1998). Gunter (2001) found that TL in a higher education environment can facilitate learning activities and create environments that enable and support innovation.

In terms of KS, Xiong and Deng (2008) showed that the effectiveness of KS among employees is dependent on the leadership style, as the latter is crucial for planning the processes used to donate and collect knowledge. Humayun and Gang (2013) found that leaders have the power to affect the intentions of employees regarding the collection of knowledge, by developing a knowledge culture within an organisation. Similarly, Wei et al. (2009) discussed the influence of leadership support on the collection of knowledge. Lee et al. (2010) suggested that employees working under leaders who focus on trust and who involve them in decision making, feel comfortable sharing their knowledge and expertise in

their organisation without fear or suspicion. Mathew (2010) argued that a lack of leadership support may be a barrier to KS in HEIs, making it difficult for staff to use knowledge and share data and information effectively.

On the other hand, some studies have looked at the KS-innovation link, such as Chen et al. (2010a) who identified a positive relationship between knowledge creation and sharing, and innovation, in the context of a supportive climate that stimulates and encourages the transfer of knowledge into innovation. Andreeva and Kianto (2011) highlighted that knowledge creation can predict product, management, and marketing innovation. Zheng et al. (2009) stated that KM includes acquisition, sharing, and application. They asserted that innovation and effectiveness is achieved in KM when KS is taken into consideration. Cheng's (2009) findings suggested that KS via interpersonal interaction and communities of practice is essential for improving teaching practice and the implementation of curricula. Huang and Li (2009) demonstrated that KM, namely the acquisition, sharing and application of knowledge, paves the way for enhancing administrative and technical innovation.

However, a causal link amongst three factors has not been developed to date. Therefore, this study seeks to examine the mediating role of KS in the relationship between TL and innovation. A few empirical studies to date have produced evidence in favour of these claims, particularly in developing countries like Iraq.

1.2 Study problem

It has been revealed that TL, KS and innovation are important to organisations. In an extensive number of previous studies, researchers have argued that leadership is an enabler of KS (Al-adaileh and Al-atawi, 2011, Song et al., 2012, Shih et al., 2012, Allameh et al., 2012, Seba et al., 2012a, Humayun and Gang, 2013) and enhances innovation (Si and Wei, 2012, Al-omari and Hung, 2012, Eisenbeib and Boerner, 2013), and that KS is an antecedent to

innovation (Andreeva and Kianto, 2011, Porzse et al., 2012, Ferraresi et al., 2012). In general, however, the causal links between the three variables have not yet been developed.

In the context of HEIs within developing countries, Jahani et al. (2011) emphasised that there is a great need to study leadership, KS (Xu et al., 2010), and innovation (Subramaniam and Youndt, 2005). According to Zwain and Teong (2012), the practice of KM within HEIs in Iraq is still new but the possibility of its acceptance is high. Given the importance of innovation in public and private organisations, particularly learning environments such as universities, it is important to enhance the level of experience relating to the teaching of courses and to improve the institutions' problem-solving abilities.

Although, it can be argued that both public and private sectors institutions face immense pressures to innovate, however leadership style may be different in public and private sectors due to the organisational and cultural environments. Public organisations are seen conservative because of their ownership, limited competition than private sector (Majumdar and Ray, 2011) and So far, it is not clear how TL affects KS and innovation in the two sectors. Thus by examining these issues within HE sector will be useful for the leaders and decision-makers of public and private HEIs facing pressure to innovate, by enabling them to overcome the barriers that prevent the development of product and process innovation among their teaching staff and contribute to develop management strategies that will work best for each sector.

This study has identified a lack of empirical studies on the relationships between TL, KS, and innovation. No such studies have examined these relationships within the field of higher education within Iraqi context. In order to fill this gap in the literature, this study aims to answer the following main question:

"What are the effects of transformational leadership on innovation through the mediating role of knowledge sharing in Iraq's public and private higher education institutions?"

1.3 Importance and purpose of the study

The importance of this study lies in its contribution to theory and practice, and the robustness of the research methodology. The study examines the impact of TL on innovation through the mediating role of KS, and the differences between public and private HEIs in this regard. From a theoretical perspective, the study advances and provides insight into the links between TL, KS, and innovation. These relations have not, to date, been studied in a higher education environment, particularly in developing countries like Iraq.

Two aspects are important for sustaining competitive advantage and continuous innovation: the first is the relationships between TL, KS and innovation. TL is known to initiate and stimulate strong effects via a variety of initiatives that raise followers' awareness of other group members' contributions (Bass and Riggio, 2012). Such leaders are able to create a suitable climate, set values and, norms, and create a culture of change. They can foster a shared vision and therefore enhance innovation (Northouse, 2007, DuBrin, 2012). Thus, it will be useful to provide a better understanding of the linkages between TL, KS, and innovation, and determine methods that can be used by leaders to promote KS activities among teaching staff.

The second important aspect is the mediating role of KS in the relationship between TL and innovation. KS is known to be a key issue in enhancing innovation (Hislop, 2013). Therefore, transformational leaders that encourage a KS culture among institutional members can foster innovation. Hence, this study contributes to the TL, KS, and innovation literature by enriching the library of theoretical relationships in HEIs within developing countries.

Although past literature has mentioned that TL (Al-mailam, 2004) and KS (McAdam and Reid, 2000) differ between public and private organisations, so far it is not clear how TL affects KS and innovation, and KS innovation, in the two sectors. Thus, by examining these issues, the current study aims to fill the gap in the literature. Furthermore, the study examines sector-based differences in TL practice and attempts to determine which behaviours, out of idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, have the biggest impact on KS and innovation, in public and private HEIs. Thereby, it will hope to give more information about the systems and policies that could used in each sector.

From a methodological perspective, the study attempts to examine the effect of TL on innovation in Iraqi HEIs through the mediating role of KS and the differences in the TL practise and the effect relationships between public and private sectors through a mixed methods approach that is a sequential explanatory design strategy. According to Creswell and Clark (2011), this approach can give stronger evidence for conclusions through convergence and the corroboration of findings, and helps the researcher to answer research questions that cannot be answered by quantitative or qualitative approach alone.

This strategy consists of two stages: quantitative and qualitative. In the quantitative stage, the study uses a self-administered questionnaire to collect data from members of staff in order to examine the causal relationships among TL, KS, and innovation, and the differences between public and private HEIs. Thus, the positivism philosophy is used at this stage, as this philosophy aims to test theory (Bryman, 2012). Then, in the second stage, the qualitative method is used to explain the unexpected results from the quantitative stage regarding differences in TL practice and their impacts on KS and innovation, as well as the effects of KS on innovation, across public and private HEIs, through the collection and analysis of interview data from the leaders of Iraqi HEIs. Hence, this stage uses the interpretivism

philosophy. This philosophy helps to interpret those research questions that cannot be answered by the quantitative approach, by obtaining information from those who have experience of the phenomenon being researched (Saunders et al., 2012). Thus, this study provides a valuable example of a methodology that might be used to track the extent of the effects of TL, and KS on innovation in other similar research.

From a practical perspective, this study could help the leaders and policy-makers of Iraqi HEIs facing pressure to be innovative, by enabling them to overcome the barriers that prevent the development of product and process innovation among teaching staff, and by providing ideas for strategies that will foster KS activities among them.

1.4 Aims and objectives of the study

The main aim of this study is to examine the effect of TL (idealised influence (ID), inspirational motivation (IM), intellectual stimulation (IS), and individualised consideration (IC)) on innovation (product (PD), and process (PC)), through the mediating role of KS (knowledge donating (KD) and knowledge collecting (KC) in public and private HEIs in Iraq, and the differences in the TL practice and the effect relationships across sectors. This aim can be divided into the following sub-objectives according to the main research question of the study:

1- To determine the effects of TL, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration on product and process innovation in Iraq's public and private HEIs.

2- To determine the effects of TL, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, on KS in Iraq's public and private HEIs.

3- To determine the effects of KS on product and process innovation in Iraq's public and private HEIs.

4- To specify a model that conceptualises the causal relationships among TL, KS, and innovation in Iraqi HEIs.

5- To explore the extent of the differences in TL practice, if any, between public and private HEIs in Iraq

6- To explore the extent of the differences in the impact of TL on innovation, if any, between public and private HEIs in Iraq

7- To explore the extent of the differences in the impact of TL style on KS, if any, between public and private HEIs in Iraq

8- To explore the extent of the differences in the impact of KS on innovation, if any, between public and private HEIs in Iraq

9- To propose recommendations to policy makers and leaders in Iraqi HEIs by establishing strategies for achieving innovation using TL and KS.

1.5 Study questions

The research questions are derived from the important contributions of the study and address the gap in the literature resulting from the lack of studies examining TL, KS and innovation in Iraqi HEIs. The main study question is as follows: "What are the effects of transformational leadership on innovation through the mediating role of knowledge sharing in Iraq's public and private HEIs?"

This poses the following questions whose answers provide essential information with which to answer the main research question:

1. What are the effects of TL, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, on product and process innovation in Iraq's public and private HEIs?

2. What are the effects of the TL components, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, on knowledge sharing in Iraq's public and private HEIs?

3. What are the effects of knowledge sharing on product and process innovation in Iraq's public and private HEIs?

4. Does knowledge sharing mediate the relationship between transformational leadership and innovation in Iraq's public and private HEIs?

5. Are there differences in the transformational leadership practice, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, between public and private HEIs in Iraq?

6. Is there a significant difference in the impact of TL on innovation between public and private HEIs in Iraq?

7. Is there a significant difference in the impact of TL on knowledge sharing between public and private HEIs in Iraq?

8. Is there a significant difference in the impact of knowledge on innovation between public and private HEIs in Iraq?

1.6 Structure of the thesis

This section provides an outline of the contents of the thesis. This thesis is divided into eight chapters. The present **Chapter 1:** introduces the background of the study, the study problem, the importance and purpose of the study, its aims and objectives, and the research questions, as well as presenting the structure of the whole thesis. The chapter ends with a summary of its contents.

Chapter 2: introduces a comprehensive literature review on TL, KS and innovation. It reviews the development of TL theory and describes different approaches to KM and KS. It further discusses the components of TL, the processes of KS, and the types of innovation that are looked at in this study.

Chapter 3: conceptualises the causal relationships among TL, KS and innovation developed in this study. It discusses the relationships between TL and innovation, TL and KS, and KS and innovation. Followed by the mediating role of the KS in TL-innovation relationship, After this, the TL in the public and private sectors and in HEIs are discussed. The study hypotheses are provided after a discussion of each component of the conceptual framework.

Chapter 4: provides a general background about the system of HEIs in Iraq. It covers the general characteristics of HEIs, the development of HEIs and scientific research in Iraq, and the international strategy adopted by MOHESR to reform the HEIs.

Chapter 5: covers the methodology of the study and describes the explanatory mixed methods (quantitative and qualitative) research design used. It discusses the questionnaire, measurement scales and data collection used in the quantitative stage, and describes the procedures used to validate the questionnaire. The chapter discusses the main procedures used in the qualitative stage, and this is followed by a description of the sample population.

Chapter 6: presents the quantitative findings. This includes the analysis of the demographic data on the respondents using SPSS 20, exploratory factor analysis (EFA), the testing of the reliability and validity of the model and multi-group analysis through confirmatory factor analysis (CFA) with AMOS 20. Then the chapter presents the outcomes of testing the hypotheses of the causal relationships using structural equation modelling (SEM) and the differences across public and private HEIs through multi-group structural equation modelling (MSEM).

Chapter 7: contains the discussion of the findings from the quantitative stage and the linking of them to the qualitative results, especially regarding the unexpected findings from the quantitative stage on TL practice and the effect relationships across public and private HEIs in Iraq. It also links the findings of both stages with the literature review in order to provide the overall findings of the study.

Chapter 8: presents the conclusion of the study. It summarises the findings of the study and presents implications for theory and practice. The chapter also provides recommendations to policy makers MOHESR, and limitations and suggestions for future research directions.

1.7 Summary

This chapter has outlined the background of the study, and has laid the foundations for the development of the study. The chapter began by describing the emergence of the idea for the study. Attention has been drawn to the importance of TL and KS for enhancing product and process innovation within academic environments. The lack of a model of TL, KS and innovation in the context of academic environments in developing countries led to the development of the importance and purpose of this study, its aims and objectives, and the research questions. A description of the structure of the whole thesis from Chapter 1 to 8 was presented.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a literature review. It is divided into three sections. The first section covers the definitions of leadership style and its importance, and theories of leadership with a focus on TL. Next, the chapter introduces the basic concepts of knowledge, types of knowledge, KM, the concept of KS and its importance, KS in public and private organisations and HEIs, and KS enablers. Finally, the chapter focuses on innovation, discussing its importance, the types of innovation, the concept and the reasons for focusing on product and process in this study. Innovation in public and private HEIs is discussed.

2.2 Leadership style

2.2.1 Leadership concept

Leadership is one of the fields that is most discussed around the world. It has gained importance in every walk of life, from business and education to social organisations. Although administrative leadership has long been a subject of interest, the scientific research on leadership began in the early 20th century. Researchers have found leadership behaviours to be important determinants of organisational success (Bass, 1990, Saenz, 2011, DuBrin, 2012). Organisations today need people with leadership ability they are believed to bring assets and success to their organisations (Northouse, 2007). Good leadership has the ability to bring change in relation to environmental demands (Schermerhorn, 2008). It is considered the solution to most organisational problems (Yukl, 2013).

Riaz and Haider (2010) noted that effective leaders have the ability to lead organisations to success by paying more attention to expected future events and environmental change.

Leadership plays a vital role in establishing high-performing teams and is one of the critical elements in enhancing organisational performance (Northouse, 2007, Betroci, 2009, DuBrin, 2012). It has been identified as one of the key factors in promoting innovation (Jung et al., 2003). According to Yukl (2010), there is no general agreement on the definition of leadership. Some of the definitions that have appeared in the past include the following:

- Leadership includes directing and coordinating the work of group members (Fiedler, 1967).

- Leadership is exercised when a group of individuals mobilises political, and other resources to arouse, engage and satisfy the motives of followers (Burns, 1978, p.18).

- Leadership comprises influential processes that affect the actions of subordinates (Yukl, 1981).

- Leadership is the ability to motivate confidence, encouragement and support among the organisational members who are required to reach the goals of the organisation (House et al., 1991).

- Daft (1999) defined leadership as the influential relationship that occurs between leader and followers who aim to make changes that reflect their shared purposes.

- Leadership is described as a process that encourages others to work hard to accomplish tasks (Schermerhorn, 2008).

- Leadership is a process that includes the effects of individuals and the group towards the accomplishment of goals (Robbins and Coultar, 2005).

- Oke et al. (2010) found leadership to be a social process that takes place in a group context in which the leaders influence their followers' behaviours to achieve desired organisational goals.

- Leadership is a process in which an individual influences a group of individuals to achieve certain goals (Northouse, 2007-2012).

- Dubrin (2007-2012) defined leadership as the ability of the leaders to motivate confidence, encouragement, and support among their followers, who are needed to achieve the goals of the organisation.

- Leadership is defined as a trait, behaviour, influence, or relation between leader and followers, or the role relationships of an administrative position (Yukl,2006, 2010, 2013).

Although different definitions listed above, most cover the following: leadership is a "process" by which a leader can affect and be affected by their subordinates. The leader's "influence" on the followers, is considered a necessary condition without which leadership cannot exist. Leadership occurs in a "group" and influences the individuals in that group to have the same goals as the leader. It involves the "accomplishment" of set of goals through the direction of a group of people.

Others, such as Daft (1999), have added another element to the idea of leadership, describing it as including the influence that occurs between leaders and their followers, that produces the outcomes the leader wants, so that both leader and followers are actively involved in the pursuit of a change aimed at reaching the required goals. Daft argued that these elements are connected and cannot be separated from the success of the process of leadership (see Figure 1)
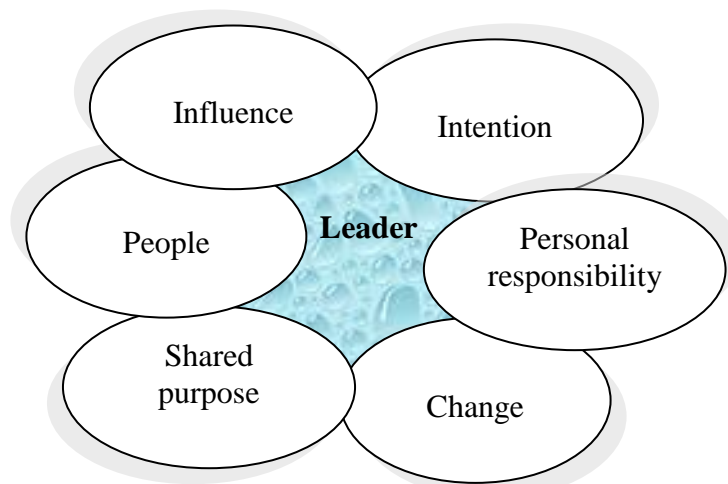
Figure 1: Elements of leadership

(Daft, 1999, p.6)

It is clear that the people who can affect others are called leaders, while the people towards whom the leadership is directed are called followers, and that both leaders and followers are connected in the leadership process (Northouse, 2007).

There is a consensus among leadership researchers that leadership centres on the same issues as management. Therefore, it is useful to differentiate it from this term. According to Bennis and Nanus (1985), management means the achievement of activities, actions and main routines, while leadership focuses on creating a vision for change and influence. Kotter (1990) further clarified the distinction between management and leadership: Management produces order and consistency through planning and budgeting, organising and staffing, controlling and problem solving. Meanwhile, leadership produces change and movement by establishing direction, aligning people, motivating and inspiring them. DuBrin (2007-2012) saw leadership as dealing with the interpersonal aspects of a manager's job, such as change and inspiration, motivation, and influence, while planning, organising and controlling deal with administrative aspects.

Although management and leadership deal with different activities, it is argued that both are essential to the success of organisations (Northouse, 2007). Thus, the two terms are complementary and overlapping, while managers who are concerned with affecting a group so as to achieve their goals, practise leadership, leaders who engage in planning, organising, and controlling are involved in management.

2.2.2 Theories of leadership

Several studies of leadership have been produced over the years (Stogdill, 1948, Stogdill, 1974, Burns, 1978, Bass, 1985, Northouse, 2007, Yukl, 2010). As a result different schools of thought have emerged regarding such aspects as traits, styles, behaviour, situational, transactional and transformational leadership.

2.2.3 The trait approach

This approach was one of the earliest attempts to study leadership in organisations. It assumes that leaders possess particular, inherent qualities that set them apart from other individuals (non-leaders); in other words, they are born, not made (Northouse, 2007, Yukl, 2013). The approach was studied by various researchers (Stogdill, 1948, Stogdill, 1974) who found that traits such as intelligence, initiative, persistence in dealing with problems, self-confidence, tolerance, dominance, cooperation and ambition were the most important traits of leadership. The approach was later criticised for several reasons, such as its failure to find universal leadership traits and the emergence of a seemingly endless list of traits. It was also said to fail to take different situations into account, such that people possessing certain traits that may make them leaders in one situation may not be leaders in other situations. It is also said to have failed to look at traits in relationship to leadership outcomes, such as effectiveness and job satisfaction, since it focused only on the identification of traits. Finally, it is not useful for training and development for leadership because traits cannot easily be taught or changed (Daft, 1999, DuBrin, 2007, Northouse, 2012).

2.2.4 The style approach

The style approach focuses on the behaviour of leaders rather than on their traits or qualities. It explains what leaders do and how they act by concentrating on two types of behaviour: task, and relationship (Betroci, 2009, Yukl, 2010). With task behaviour, leaders help followers to accomplish their goals, whereas with relationship behaviour they help them to feel relaxed with each other and with the situation. The main purpose of this approach is to explain how leaders combine these two types of behaviour so as to influence followers in their efforts to reach their goals.

Three well-known studies are representative of the ideas of this approach and have been reported in the literature (Sadler, 2003, Yukl, 2006, DuBrin, 2007, Western, 2008, Betroci, 2009, Northouse, 2012, Yukl, 2013). These studies are: the Ohio State University study, the University of Michigan study, and the Blake and Mouton study. According to the Ohio State University study, there are two types of leadership style: the style that initiate structure, and the style that uses consideration. The first includes organising work, adding structure to the work context by defining the roles and responsibilities of the leaders, and scheduling work activities. In consideration behaviour, meanwhile the leaders establish trust, respect and relationships between them and their followers, listen to them and express appreciation for their work.

The University of Michigan study paid more attention to the impact of leaders' style on the performance of their followers. The study concluded that leaders have two types of behaviour: employee orientation, and production orientation. In employee orientation the leaders build human relationships, show trust, and confidence, pay special attention to their followers' personal needs, and try to understand their followers' problems. This style is similar to the consideration style in the Ohio State study. Meanwhile, production orientation includes leadership behaviour that explains the technical and production aspects of the task,

and here the followers are viewed as a means for getting work accomplished. This behaviour is parallel to the initiating structure style in the Ohio State study. The Michigan study conceptualised the employee and production orientations as lying at opposite ends of a single continuum, so that leaders who are oriented towards production are less oriented towards employees, and vice versa.

The Blake and Mouton study is sometimes called the managerial leadership grid. This study was introduced in the early 1960s and has been revised several times since then (Northouse, 2007, Yukl, 2010). The model focused on how leaders help organisations to reach their goals through two factors: orientation of people and orientation of production and through the intersection of these two behaviours the model generated five types of leadership style (see Figure 2):

- Authority compliance (9, 1): concentrates on work tasks and gives less emphasis to employees. Here, the leader is often seen as controlling, driving and over-powering.

- In impoverished management (1, 1), the leader takes little care over both tasks and relationships, have little contact with their followers and are non-committal and apathetic.

- Middle of the road management (5, 5): According to this style, the leaders have an intermediate focus on both the task and people, they avoid conflict and emphasise moderate levels of production and interpersonal relationships.

- Country club management (1, 9): the leader focuses on interpersonal relationships with the followers and tries to provide and generate a suitable climate for them by paying special attention to their personal and social needs, while their orientation towards production is low.

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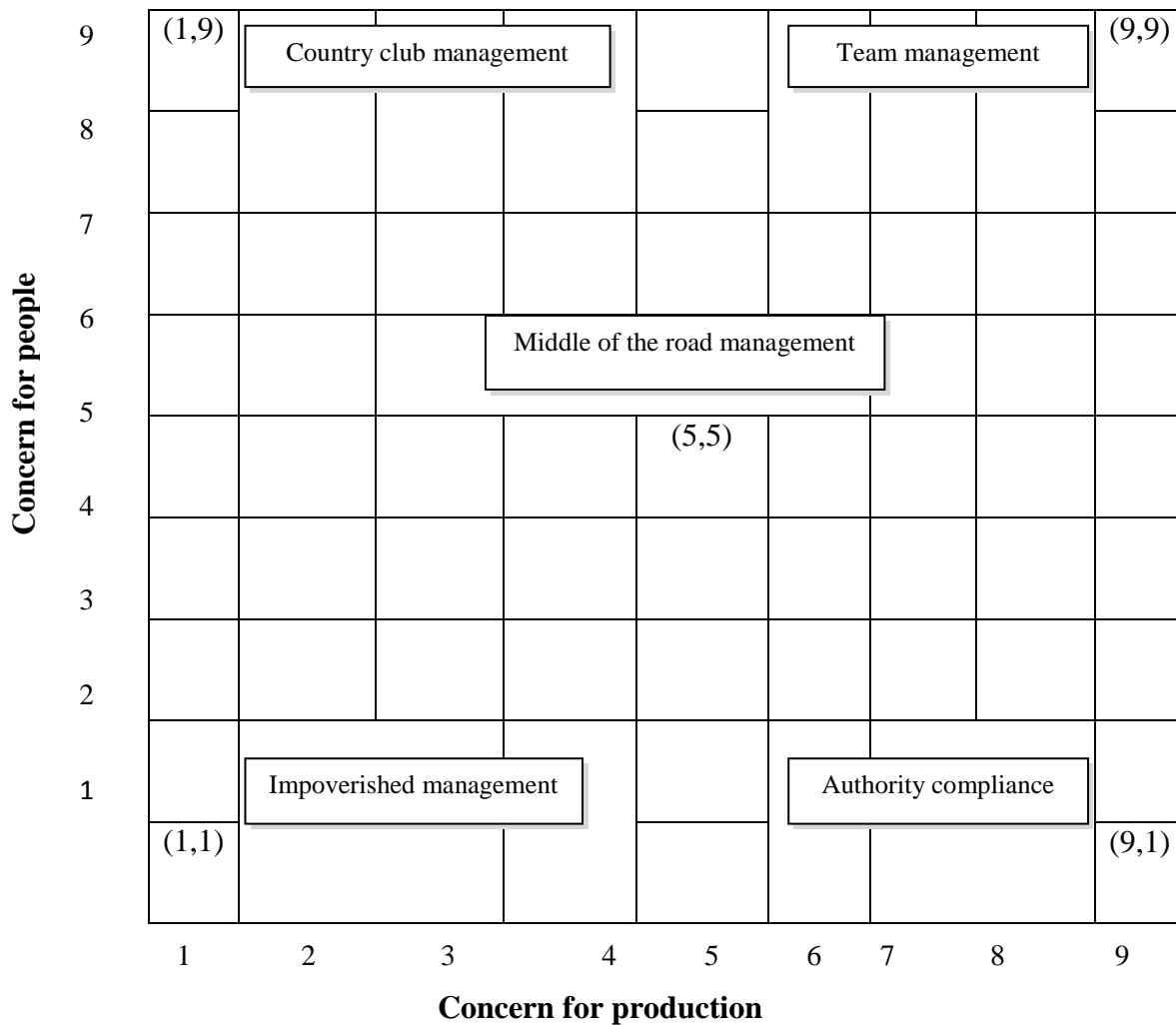
Figure 2: Managerial leadership grid

(Northouse, 2007)

- In team management (9, 9), the leaders emphasise both tasks and interpersonal relationships, encourage teamwork in the organisation and make their employees involved in and committed to their work.

Despite the positive applications of the theories generated under this approach like the trait approach it failed to find a universal style of leadership that would be effective in every situation, and did not adequately show how leaders' styles are associated with performance outcomes.

2.2.5 The situational approach

This approach was developed by Hersey and Blanchard (1988). It implies that leaders adapt their style to the demands of different situations. Yukl (2010) argued that the essence of situational leadership is that leaders link their style to the commitment of their followers and recognise organisational members' needs and then adapt their own style to those needs. The approach emphasises that leadership includes both directive and supportive behaviour. Directive behaviour helps employees to accomplish the goals by giving directions, defining roles, and showing them how the goals are to be achieved. Supportive behaviour, meanwhile, helps organisational members to feel comfortable about themselves and the situation. These two styles can be classified further into four categories (see Figure 3):

- (S1) directing: high directive and-low supportive style. The leaders give explicit directions about how work tasks should be achieved.
- (S2) coaching: high directive and-high supportive. Here, the leaders focus on both achieving goals and meeting followers' socio-emotional needs.
- (S3) supporting: high supportive and-low directive. These leaders focus on supporting employees by listening, asking and giving feedback.
- (S4) delegating: low supportive and-low directive. These leaders offer less in terms of both task input and social support.

High

Supportive behaviour ⟶

Supporting	Coaching
S3	S2
Delegating	Directing
S4	S1

Low ⟵ Task behaviour ⟶ High

High	Moderate		Low
D4	D3	D2	D1

Developed ⟵⟶ Developing
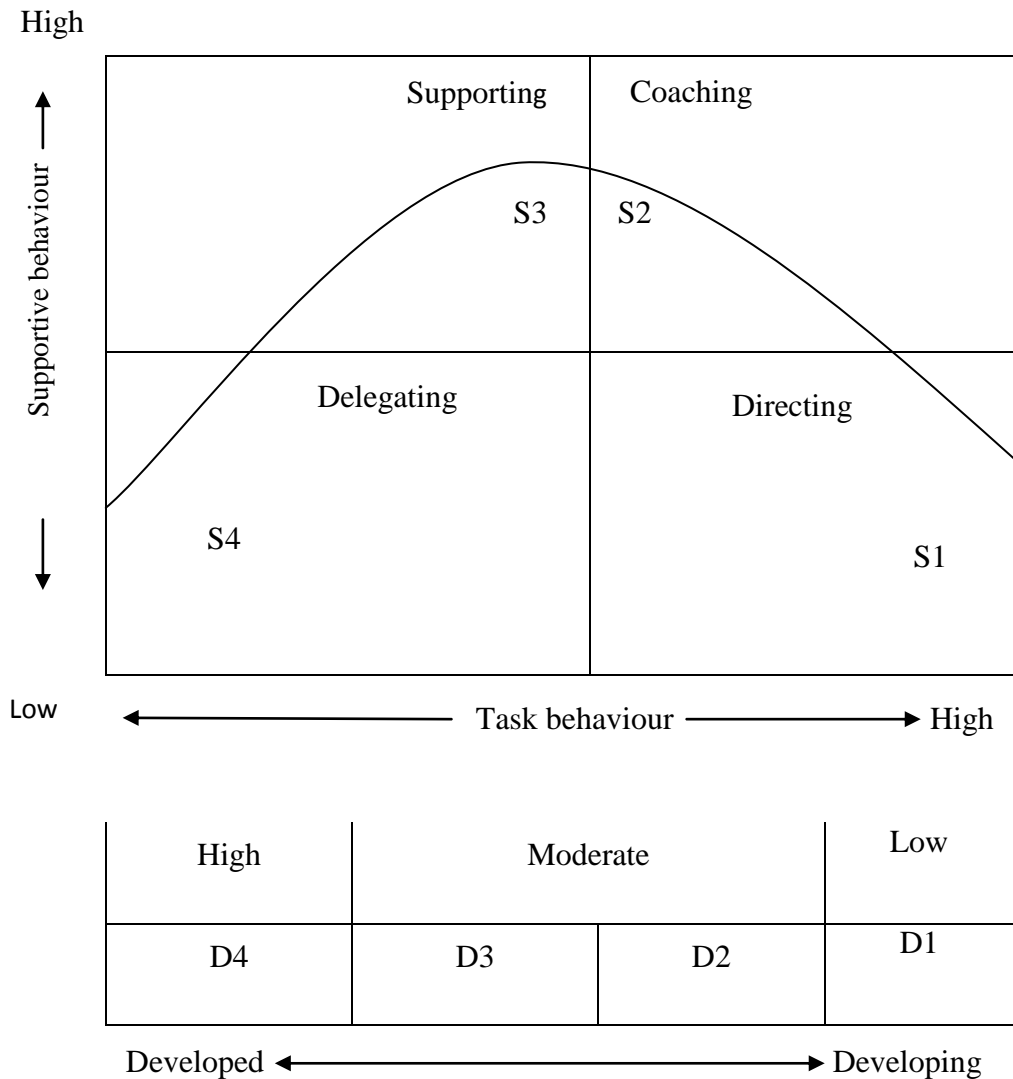
Figure 3: Situational leadership

(Northouse, 2007)

The second part of the situational approach concerned developing the level of the followers by promoting competence and commitment to accomplishing tasks. In Figure 3, D1 represents organisational members who are unwilling to take responsibility for their tasks. Employees at D2 have started to learn their job. D3, here the employees have moderate to high competence and commitment to the tasks. At D4, the employees have both a high degree of competence and the commitment to accomplish their tasks.

Northouse (2007) noted that this approach has some limitations in spite of use for leadership training and development, such as the ambiguous conceptualisation in the model, the fact that it does not make it clear how commitment is combined with competence to form four distinct levels of development, and the fact that it does not explain how competence and commitment are weighted across the different levels.

2.2.6 Contingency theory

This theory tries to link leaders with appropriate situations. It assumes that the effectiveness of a leader depends on their style. Thus, it is concerned with both styles and situations (Northouse, 2007, Yukl, 2010). The leading researcher on this theory was Fiedler (1967). Within contingency theory, leadership styles are described as "*task motivated*" and "*relationship motivated*" (DuBrin, 2007). The task-motivated refers to reaching goals, while relationship-motivated leaders develop close interrelationships. Fiedler developed the least preferred co-worker (LPC) scale to measure leadership style. Accordingly, the leader who scores high on the scale is described as relationship motivated, while the leader who scores low is identified as task motivated.

The theory suggests three situational factors: leader-member relations, task structure, and position power. Leader-member relations include group atmosphere, the degree of confidence, and loyalty. If the group atmosphere is positive and the followers trust their leaders, then leader-member relations are defined as good, but if the atmosphere is unfriendly, this factor is defined as poor. Task structure refers to whether the requirements of the task are clear, Tasks that are structured tend to give more control to the leader, whereas unclear tasks reduce the leader's control and influence (see Figure 4):

Leader-Member relations	Good				Poor			
Task structure	High structure		Low structure		High structure		Low structure	
Position power	Strong power	Weak power	Strong power	Weak power	Strong power	Weak power	Strong power	Weak power
	1	2	3	4	5	6	7	8
Preferred leadership style	Low LPCs Middle LPCs		High LPCs					Low LPCs

Figure 4: Contingency theory

(Fiedler, 1967)

Position power includes the authority of the leader to reward or punish the followers.

2.2.7 Path-goal theory

This theory has appeared in the work of Evans (1970), House (1971-1996), and House and Mitchell (1974). The main aim of the theory is to improve and enhance the performance of the employees by focusing on their motivation. It assumes that leaders can enhance followers' goal attainment by providing them with rewards in the organisation and making the path to the goal clear through coaching and directing. The theory states that there are four types of leadership behaviour, which can affect the motivation of followers (Daft, 1999, Sadler, 2003, Northouse, 2007, Western, 2008, Betroci, 2009, DuBrin, 2012, Yukl, 2013): supportive, directive, participative, and achievement-oriented.

Supportive leadership consists of being friendly and giving followers respect, promoting a team climate, and dealing with followers as equals. This type of leadership is similar to the consideration style in the Ohio State study. According to the directive style, the leaders show

the followers what they have to do by organising, planning, making schedules, and putting performance goals in place. They also make the rules and regulations clear to the followers. This style is similar to the initiating structure style in the Ohio State study. Participative leadership involves asking the followers for their thoughts, opinions and suggestions, and stimulating their participation in decision-making. Finally, in achievement-oriented leadership, the leaders try to give high-quality performance and stimulate followers' confidence, while helping them to reach high goals.

Although path-goal theory is seen as more advanced than the situational approach, it fails to describe how leaders could use various styles to help their followers feel competent because it incorporates the tenets of expectancy theory, which suggests that followers will be motivated if they believe their efforts will produce results (DuBrin, 2007, Yukl, 2010).

2.2.8 The Bass theory of transformational and transactional leadership

The theory of transformational and transactional leadership was initially introduced by Burns (1978) when he was describing political leaders. The main aim of this theory was to find a relation between leadership and followership by describing transformational leadership as a process in which leaders and followers are related to each other and raise and motivate one another to higher levels (Daft, 1999, DuBrin, 2007, Owen et al., 2004, Western, 2008, Lynch, 2012, Yukl, 2013). The theory also distinguished between two types of leadership: transactional, and transformational. Transactional leadership focused on the exchanges that happen between leaders and their followers, whereas transformational leadership represented the interaction that occurs between leaders and their followers in which both sides play a dynamic part in affecting the other's perceptions and actions. This type of leadership focuses on the emotions of the followers and tries to help them reach their potential goals (Northouse, 2007, DuBrin, 2012).

At the same time as Burn's theory was presented, House (1976) introduced a theory of charismatic leadership. This theory concentrated on leaders with particularly strong charismatic influence over their followers and indicated that charismatic leaders behave in novel ways that have specific effects on their followers. House (1976) mentioned that charismatic leaders display specific types of behaviour: firstly, they act as strong role models for the beliefs, attitudes, and values they want followers to adopt. Secondly, they show competence to their followers. Finally, they set high expectations for their followers and try to create confidence in them in order to help them accomplish these expectations. According to this theory, charismatic leadership has several direct effects, such as followers' trust in the leader's belief, expressions of warmth towards the leader, emotional involvement in the leader's goals, and heightened follower confidence in goal achievement.

In the mid-1980s, Bass (1985) developed Burns' theory of transforming leadership in "leadership and performance exceptions" into transformational leadership (TL) by paying more attention to followers' rather than leaders' needs (Yukl, 2013), and expanded House's theory by paying more attention to the emotional factors of charisma and suggesting that charisma is an essential but not adequate condition for TL (Northouse, 2007) (see Figure 8). The theory encompasses transactional leadership, laissez-faire leadership and TL, which will be discussed in the following sections.

2.2.9 Transactional leadership

Transactional leadership represents the transaction exchange that occurs between leaders and followers. This exchange depends on the leader explaining to the followers what is needed and stating the conditions and the rewards. Hence, it is based on the assumption that followers are motivated by a system of rewards such as monetary incentives and promotion, and by punishment (Bass, 1990, Avolio and Bass, 2002, Antonakis et al., 2003, Bass and Riggio, 2006, Yukl, 2010, Lynch, 2012). It is argued that there are three behaviours involved

in practising transactional leadership: contingent reward, active management by exception (MBE-A), and passive management by exception (MBE-P). Contingent reward refers to the exchange process that occurs between leaders and their followers in which efforts made by followers are exchanged for specified rewards. Here, the leader clarifies the expectations and establishes rewards that will be given when the followers meet these expectations. Active management by exception includes corrective criticism that occurs when leaders observe their followers, look for mistakes, and then correct their actions. Passive management by exception refers to negative feedback, whereby the leaders use a passive style after problems arise (Betroci, 2009, Bass and Riggio, 2012, Yukl, 2013).

2.2.10 Laissez-faire leadership

This style of leadership, in contrast to transactional leadership, represents a non-transaction. It refers to the absence of leadership. Here, the leader ignores the responsibilities of leadership and avoids making decisions. There is no feedback provided to the followers and they make little effort to help the followers satisfy their needs. They also avoid getting involved when important issues arise (Avolio and Bass, 2002, Antonakis et al., 2003, Bass and Riggio, 2006, Northouse, 2007, Yukl, 2010).

2.2.11 Transformational leadership

Bass and Riggio (2012) described TL as a process in which people are changed and transformed. It involves attempts to make changes that increase organisational effectiveness and the performance of the followers, by transforming the latter's personal values and self-concepts (Avolio and Bass, 2002, Antonakis et al., 2003, Sashkin, 2004, Bass and Riggio, 2006, DuBrin, 2007, Hawkins, 2011, Saenz, 2011). The theory is based on the assumption that followers need to be respected, appreciated, admired and trusted in order for the leader to gain their loyalty, and that everyone has a special contribution to make (Northouse, 2007, Lynch, 2012, Yukl, 2013). The existence of this kind of leadership is reflected in

subordinates who are enthusiastic about the leader's opinions and ideas (Schermerhorn, 2008). TL generates commitment from subordinates and produces a greater quantity of work and more creative problem solving (Saenz, 2011, Limsila and Ogunlana, 2008). It emphasises intrinsic motivation of followers, ethical behaviour, the development of leadership among team members, and a shared vision and goals (Bass and Riggio, 2006, Yukl, 2010). Hence it deals with emotions, values, ethics and long-term goals, unlike transactional leadership which focuses on short-term goals (Rafferty and Griffin, 2004, Northouse, 2007).

To practice TL, researchers have suggested different behaviours. For instance, Podsakoff et al. (1990) identified six behaviours: identifying and articulating a vision, providing an appropriate model, fostering the acceptance of group goals, high performance expectations, providing individualised support, and intellectual stimulation. Leithwood and Jantzi (2000) also proposed six styles: building a vision and aims, providing intellectual urging, providing individualised support, symbolising professional practices and values, and showing high performance expectations. Rafferty and Griffin (2004) suggested five dimensions of TL: vision, inspirational motivation, intellectual stimulation, supportive leadership, and personal recognition. Xirasagar (2008) listed idealised influence-behaviour, idealised influence-attribute, inspirational motivation, intellectual urging, and individualised consideration as the dimensions needed practise TL within an organisation. Betroci (2009) indicated that TL was an ability based on three elements: charisma, individualised attention, and intellectual stimulation.

According to Bass (1985-1990), Avolio and Bass (2002), Antonakis et al, (2003), and Bass and Riggio (2006-2012), and in line with the objectives of the current study, there are four behaviours that form the basis of TL: idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration. "*Idealised influence*" involves setting an example for followers to follow. This style can be regarded in terms of "behaviour

and attributes". It refers to the charismatic behaviour shown by transformational leaders who express confidence in the organisational vision (Antonakis et al., 2003, Northouse, 2007). Leaders with this style instil trust, respect, admiration, pride, and faith organisational members. Such leaders have the ability to foster cooperation with others (Bass and Riggio, 2006, Saenz, 2011). They are perceived by their followers as having extraordinary capabilities, persistence, and determination (Betroci, 2009, Bass and Riggio, 2012). Transformational leaders practising the idealised influence style can provide their followers with a vision and a sense of mission. They consider the needs of others over their own needs, share the risks with their followers, and refuse to use their power for personal gain (DuBrin, 2007, Yukl, 2013). Bass and Riggio (2006) argued that leaders using this style show a sense of purpose, and demonstrate high standards of ethical and moral conduct. They can contribute to reduction in complexity by getting others to rally around them in the pursuit of innovation and performance.

Under *"inspirational motivation",* leaders try to inspire their followers by motivating them to become committed to the organisational vision. They encourage members to focus on organisational objectives, and have the ability to motivate their followers by providing meaning and challenge to their work (Avolio and Bass, 2002, Sashkin, 2004, Western, 2008, Bass and Riggio, 2012). It is argued that leaders with inspirational motivation are able to build relationships with their followers through interactive communication. They encourage individual and team spirit and collaboration among organisational members, identify new opportunities, and encourage followers to envision attractive future states (Northouse, 2007, Lynch, 2012). Bass and Riggio (2012) noted that this style can enhance followers' self-efficacy beliefs and improve their motivation. Such leaders, challenge followers with high standards, and talk optimistically and with enthusiasm.

"Intellectual stimulation" is the degree to which leaders encourage their followers to try new approaches, and to re-examine and challenge existing assumptions. They encourage imagination, and develop innovative ways of dealing with organisational issues (Betroci, 2009, Yukl, 2010, DuBrin, 2012) Transformational leaders with this style have the ability to encourage followers to be creative and innovative and to challenge their own beliefs and values. Followers' ideas are not criticised if they differ from the leaders' ideas (Bass and Riggio, 2006). Followers are encouraged to reframe problems to find new methods of solving them from different perspectives. They know that creativity, and knowledge creation are the only way to sustain a competitive advantage (Avolio and Bass, 2002, Northouse, 2012).

When practising *"individualised consideration",* leaders build interactive relationships with followers and pay special attention to their needs (Avolio and Bass, 2002, Saenz, 2011). They show support, consider their skills, and abilities, and show appreciation for their work, as well as spending time listening to their individual needs (Bass and Riggio, 2006, DuBrin, 2012). Leaders operating according to this style act as coaches and mentors when trying to assist their followers to become fully actualised and to develop job-related competencies with empathy and consideration (Northouse, 2007, Lynch, 2012). Such leaders have the ability to build and develop a sense of determination and self-confidence (Bass and Riggio, 2012). Individualised consideration is practised by leaders when new learning opportunities are created within a supportive climate. Such leaders use delegation to help organisational members grow through personal challenges, and practise management by walking around. Leaders with this style are aware of individual desires and see the individual as a whole person rather than as just a member (Antonakis et al., 2003, DuBrin, 2007, Hawkins, 2011, Yukl, 2013).

These four behavioural patterns positively affect followers by elevating them to the best they can be, motivated by the desire for achievement and self-development.

Effective

4I's

CR

Passive ———————— MBE-A ———————— Active

MBE-P

Frequency

LF

Ineffective
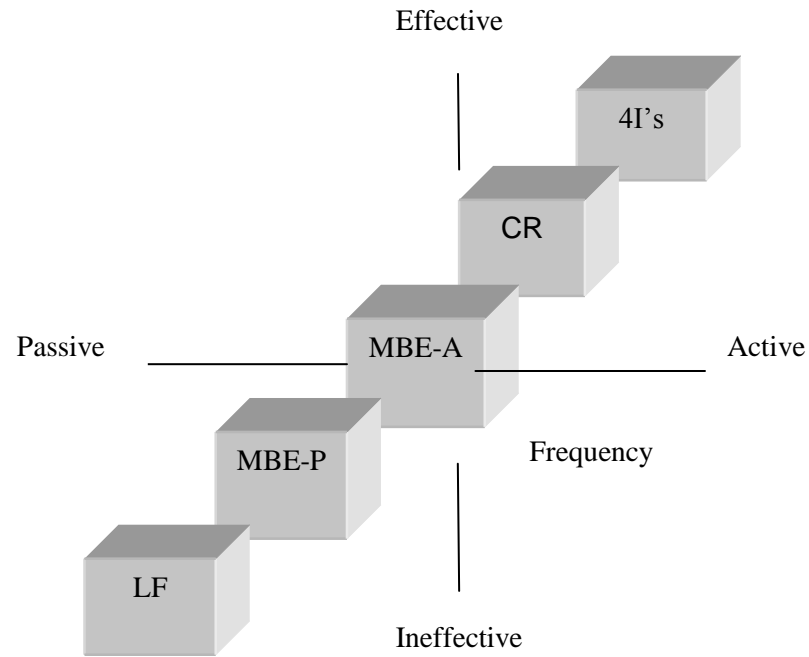
Non-leadership
LF: laissez-Faire
Transactionnel
MBE-P: Management by exception-passive
MBE-A: Management by exception-active
CR: Contingent reward
Transformational 4 I's:
Idealised influence
Inspirational motivation
Intellectual stimulation
Individualised consideration

Figure 5: Bass' theory of transformational and transactional leadership

(Northouse, 2007, p.182)

Researchers today acknowledge the importance of transformational leadership over transactional and laissez-faire. Therefore, this study focuses on TL only.

2.2.12 Why transformational leadership?

TL has gained wide popularity among leadership scholars and researchers over the past several years and is still popular today. According to Bass and Riggio (2006-2012), this type of leadership can be applied to any organisation and can be found at various levels of the organisation. Ismail et al. (2010) pointed out that TL practice can lead to followers' placing

greater trust in their leaders, which in turn promotes improved individual performance. Transformational leaders strengthen employees' capacity to achieve by giving them the knowledge and resources to do their jobs (Betroci, 2009). It is argued that the power of TL lies in the visualisation of the organisation (Tichy and Devanna, 1990). Transformational leaders try to turn threats associated with mistakes and failure into opportunities to learn (Avolio and Bass, 2002). They can cope with complexity, uncertainty and ambiguity (Tichy and Devanna, 1990), TL is useful during turbulent times such as when rapid changes and globalisation are taking place (Bass and Riggio, 2012). It increases the determination to overcome crises and encourages the generation of new ideas, which are the core of innovation (Rafferty and Griffin, 2004). Such leadership clarifies the situation and helps prepare for future crises (Bass and Riggio, 2006, DuBrin, 2012). TL is the motor and transmitter of an innovative culture and knowledge diffusion, which help provide the best possible organisational performance (Saenz, 2011).

de Jong and Hartog (2007) explained that TL can contribute to organisational learning and employees' creativity. Such leaders can encourage followers to participate in educational programmes and develop the skills needed to achieve exceptional performance (Northouse, 2007, Yukl, 2013). Leaders practising TL are able to enhance team cohesion, organisational commitment and job satisfaction (Pataraaechachai and Ussahawanitchakit, 2009, Mohammad et al., 2011). A survey of 194 managers within UAE banks carried out by Awamleh et al. (2005) indicated that satisfaction, performance, and the self-esteem of employees are the outcomes of TL. Similarly, Yang et al. (2011) found that TL, practised through idealised influence, intellectual stimulation, and individualised consideration, can have a positive effect on job satisfaction and commitment to change. Transformational leaders are able to create a supportive climate among organisational members by facilitating communication networks, team spirit, trust and knowledge sharing (Avolio and Bass, 2002, DuBrin, 2007, Northouse,

2012, Lynch, 2012, Jung et al., 2003). Such leaders have the ability to create an environment and culture that fosters change (Bass and Riggio, 2012).

Transformational leaders attempt to make changes that increase performance, and organisational effectiveness, generate greater productivity and exceed expectations (Janadghi et al., 2009). TL focuses on social values and appears in times of distress (Northouse, 2007, DuBrin, 2012). Such leaders elevate followers' personal values and self-concepts and encourage them to transcend their own self-interest for the sake of the organisation (Bass and Riggio, 2006, Saenz, 2011). They reduce stress among organisational members by creating a sense of identity with a social network of support (Antonakis et al., 2003, Sashkin, 2004, Yukl, 2013). They try to change the visions, strategies, and cultures of an organisation by promoting creativity among members and developing the relationships among them (Saenz, 2011).

Although many studies have looked at a mixture of transformational and transactional leadership, most have found the former to have more of an effect. For instance, Yang (2007b) found that transformational leaders interact more with organisational members than transactional leaders. Crawford et al. (2003) found transformational to have more of an effect on the personal creativity of the employees than transactional leadership. Findings from a study of 120 managers working in manufacturing companies in the US carried out by Laohavichien et al. (2009) revealed that TL influences infrastructure and quality management more than transactional leadership. Additionally, Rui et al. (2010) showed that TL is necessary to improve quality. Erkutlu (2008) argued that transformational leaders are ultimately more proactive, and effective than transactional leaders, and suggested that, for an organisation to succeed in a fast-changing environment, managers must make full use of TL. Similarly, Politis (2001) revealed that transactional leadership is less effective for knowledge acquisition attributes, namely communication/problem understanding, personal traits, control,

organisation, and negotiation, than TL. A meta-analysis by Lowe et al. (1996) showed that leaders who exhibited TL were perceived to be more effective, with better work outcomes, than those who exhibited only transactional leadership. Similarly, Boerner et al. (2007) and Limsila and Ogunlana (2008) both found that TL had a larger influence on followers' performance and creativity in solving problems than transactional leadership. A pilot study conducted by Sabri (2007) within the Jordanian International Air Transport Association (IATA) demonstrated that managers practice TL more than transactional leadership.

Within the higher education environment, TL is essential for developing education (Butcher et al., 2000, Green, 2010). TL can facilitate learning activities and create an environment that supports knowledge (Gunter, 2001). A survey of 256 faculty members of Pakistani universities, carried out by Bodla and Nawaz (2010), demonstrated that TL increases job satisfaction. Additionally, Pihie et al. (2011) suggested that TL can enhance staff members' job satisfaction more than transactional and laissez-faire leadership, based on their study of Malaysian universities. Pounder (2001-2008) concluded that the effectiveness of universities is dependent on leaders who exhibit aspects of TL. Findings from research based on 160 staff of private educational institutions in Egypt, conducted by Mohamad (2012), demonstrated that TL increases job satisfaction and organisational commitment. Furthermore, numerous recent studies (Lo et al., 2009, Lo et al., 2010, Athalye, 2010, Neufeld et al., 2010, Sadeghi and Pihie, 2012) have suggested that TL has the ability to enhance lecturers' commitment to change and performance.

2.3. Knowledge sharing

2.3.1 What is knowledge?

The concept of knowledge has been discussed by several researchers and philosophers, and this has led to many arguments, views, and definitions. According to Nonaka (1994), knowledge is a multidimensional concept. It is defined as a "*justified true belief*" (Nonaka et al., 2006, von Krogh et al., 2012). This definition focuses on truthfulness as an essential attribute of knowledge. In this regard, Cook and Brown (1999) noted that there are two perspectives or epistemologies of knowledge theory, namely possession and practice. Epistemology of possession treats knowledge as something people or individuals have. It assumes that knowledge is an entity/object that people possess, and refers to cognitive aspects, capacity, and resources that can be used to improve effectiveness in the workplace (Newell et al., 2009, Ichijo and Nonaka, 2007b). Alavi and Leidner (2001) agree with this perspective and see knowledge as:

> "*Information possessed in the mind of individuals, which may or may not be unique, useful or accurately related to facts, procedures, and judgments*" (p.109).

Epistemology of practice, on the other hand, defines knowledge as something people do. Therefore, it refers to that knowledge as subjective, constructed and negotiated, and practised through social interaction (Hislop, 2009, Newell et al., 2009, Nonaka, 2005, Hislop, 2013).

Alavi and Leidner (2001) explained that knowledge can be described from several perspectives, such as a state of mind, an object, a process, a condition of having access to information, or a capability. They described the state of mind perspective as the fact of knowing something, which focuses on enabling individuals to expand their personal knowledge and apply it to the organisation's needs. The object perspective assumes that knowledge can be viewed as a thing to be stored. The process perspective focuses on the

applying of expertise. According to the perspective of knowledge as the condition of having access to information, organisational knowledge is organised so as to facilitate access to and the retrieval of content. The capability perspective suggests that knowledge means having the capacity to interpret and use information, learning and experiences in decision-making. Armstrong (2009) described knowledge as understanding people, things, concepts, theories, and the way to do things.

Other researchers have argued that knowledge can be organised into a hierarchy. For instance, Uriarte (2008) found that knowledge consists of data, meaning raw numbers, facts and images that are derived from observation and not analysis, and information that summarises the data. Similarly, Ellis (2003) saw data as facts that are organised so as to generate information. From Davenport and Prusak's (1998) view, knowledge is complex and different from data and information, but at the same time related to both of them.

Additionally, Al-aLawi et al. (2007) saw knowledge as more complicated than information, and information as resulting from analysing and organising data into a meaningful form. Braganza (2004) also saw knowledge as leading to information, which produces data. Vandaie (2008) stated that data represent the raw facts, which are processed to become information, while information reflects the experiences of individuals, which is considered to be knowledge. Ackoff (1989) gave a broader definition of knowledge by adding wisdom to the top of the hierarchy, and indicated that the sequence of knowledge can be organised into data, information, knowledge, and wisdom. He argued that the first three types deal with the past, while wisdom deals with the future (see Figure 6). Wisdom is made up of experiences and the interaction of information. It reflects the values and criteria that apply to knowledge, and its essence is judgement (Russell, 2007, Sarmento, 2005).
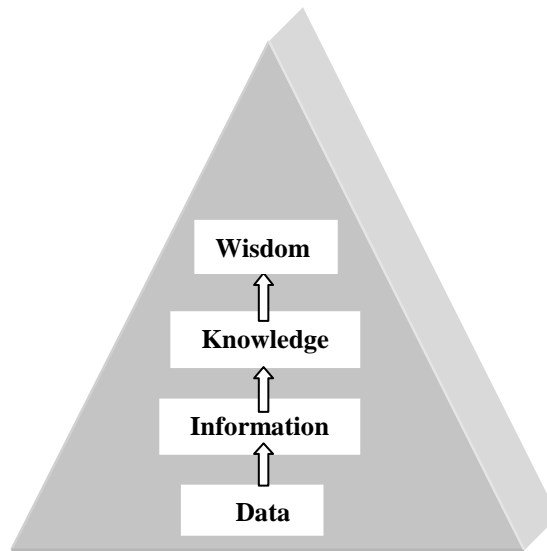
Figure 6: Hierarchy of knowledge

(Newell et al., 2009, p.3)

Tuomi (1999) sees knowledge as existing before information can be articulated, and information as existing before data. Hence, from this view, data, information, and knowledge cannot be separated. Smith (1998) agreed and also explained that information has to be understood and translated in order to become knowledge. Hislop (2009) found that information is filtered and summarised data, and that knowledge is the translated meaning of information.

It follows from these arguments and views that there are four elements related together in the hierarchical structure: data and information from the basic building blocks of knowledge and wisdom, and at the same time, knowledge can be used to generate data and information.

Bartol and Srivastava (2002) and McMurray and David (2002) considered knowledge to be a broad concept which includes experiences, values, experts, information, and ideas that help people and the organisation to develop . Davenport and Prusak (1999) defined knowledge as:

> *"a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information" (p.5).*

Despite the different definitions of knowledge given above, there is a common agreement among scholars and researchers that knowledge is a mix of data, information, skills, and experiences, which are related to each other and which may be used in decision-making.

2.3.2 Types of knowledge

The previous literature has described different types of knowledge. For instance, Conklin (1997) distinguished between formal and informal knowledge. Formal knowledge is obtained from books and, manuals and is easily shared, while informal knowledge is obtained from social interaction and is used to create formal knowledge. Christensen (2007) described four types of knowledge: professional, coordinating, object-based knowledge, and know-how knowledge. Fernandez et al. (2004) distinguished between declarative knowledge, which refers to beliefs about the relationships among variables, and procedural knowledge that includes the skills and ability to do something. A distinction is sometimes drawn between causal (know-why), conditional (know-when) and relational (know-with) (Nolan Norton, 1998).

Others have divided knowledge into individual and social knowledge. Individual knowledge, sometimes called collective knowledge, is created by individuals, while social knowledge refers to knowledge that is created and inherent in the collective actions of a group (Nonaka, 1994). From Mathew's (2008) point of view, knowledge can be classified into factual, situational, and social types. Factual knowledge refers to knowledge that is based on knowing the facts, situational knowledge includes knowledge acquired about a particular situation, while social knowledge focuses on social issues such as social networks and relationships. Lopez-Saez et al. (2010) noted that knowledge can be external or internal. External knowledge can be obtained from customers, suppliers and other organisations/institutions,

while internal knowledge comes from internal sources such as organisational members, the R&D department, or the production department

However, the types of knowledge that are most commonly used in the literature are tacit and explicit knowledge, which are the focus of this study. These types of knowledge were first used by Polanyi (1967) but have since been applied to the context of organisations by Nonaka (1994). Tacit knowledge describes the personal, the subjective, and the intangible (Nonaka, 1994, Nonaka, 1995, Hislop, 2009). It is embedded in the minds of people, is accumulated through study, learning, and experiences, and developed through conversations, workshops, job training, and social interaction (Nonaka and Takeuchi, 1995, Nonaka and Toyama, 2005, Polanyi, 1967, von Krogh et al., 2012). Nonaka et al. (2006) explained that tacit knowledge consists of two elements: the technical and the cognitive. The technical element refers to informal personal skills that apply to a specific context, such as know-how and crafts, while the cognitive component includes beliefs, paradigms, values and a person's mental model. Tacit knowledge is difficult to communicate, articulate and transmit (Hislop, 2005). It is argued that this type of knowledge is less familiar and unconventional. Kim and Ju (2008) found that members of staff in HEIs obtain this type of knowledge either by teaching courses or as a result of professional experience. It includes their problem-solving ability, and their capability to conduct research. Tacit knowledge can be a source of competitive advantage in an organisation (Bryant, 2003, Chen and Edginbton, 2005). It is crucial to getting things done and is the key to organisational tasks, such as creating new knowledge, generating new products, and improving procedures, that lead to innovation (Seidler-de Alwis and Hartmann, 2008).

In contrast to tacit knowledge, explicit knowledge denotes knowledge that is articulated, objective, externalised and captured, and has a more tangible format (Yahya and Goh, 2002). This type of knowledge is saved in documents and found in books, databases, models,

procedures, rules, policies, and regulations, making it easily shared between individuals and organisations. Therefore it is more common in the workplace (Nonaka, 2005, Ichijo and Nonaka, 2007b, Uriarte, 2008, Birasnav et al., 2011, von Krogh et al., 2012). Nonaka et al. (2006) argued that explicit knowledge includes object-based and rule-based knowledge. Object-based knowledge refers to intangible knowledge such as words, numbers, and, formulas, and tangible knowledge such as equipment, and documents, while rule-based knowledge refers to knowledge that is translated into the rules, routines, and procedures of the organisation. Therefore, it is referred to as know-what. Kumar et al. (2013) explained that the advantage of this type of knowledge is that it is easy to share and can be reused to solve similar problems.

These two types of knowledge are complementary; without tacit knowledge it would be difficult to understand explicit knowledge (Uriarte, 2008, Hislop, 2009). Nonaka et al. (2006) argued that personal knowledge can become organisational knowledge through interactions between tacit and explicit knowledge in four ways: socialisation, externalisation, combination, and internalisation (SECI) (see Figure 7). Socialisation involves transfer from tacit-to-tacit knowledge. Here, the experiences of the organisational members are shared through direct and indirect communication or interaction, such as seminars, discussions, brainstorming, informal meetings, and training. Here, personal knowledge is exchanged but remains tacit knowledge.

Externalisation, involves a transfer from tacit-to-explicit knowledge through the use of metaphors, analogies, hypotheses and concepts, wherein written, and technological channels are used to create knowledge for others. This process is considered a key in knowledge conversion because through it the exploitation of knowledge is born. Combination is the transfer, from explicit-to-explicit knowledge using social processes to combine knowledge such as documents, meetings, and telephone and other types of conversation. Here, the

knowledge is processed and categorised in order to create new knowledge. It is easily documented and distributed, as the knowledge is explicit and evident (von Krogh et al., 2012).

To

	Tacit Knowledge	**Explicit Knowledge**
Tacit	Socialisation	Externalisation
Explicit	Internalisation	Combination

(left label: **From**)
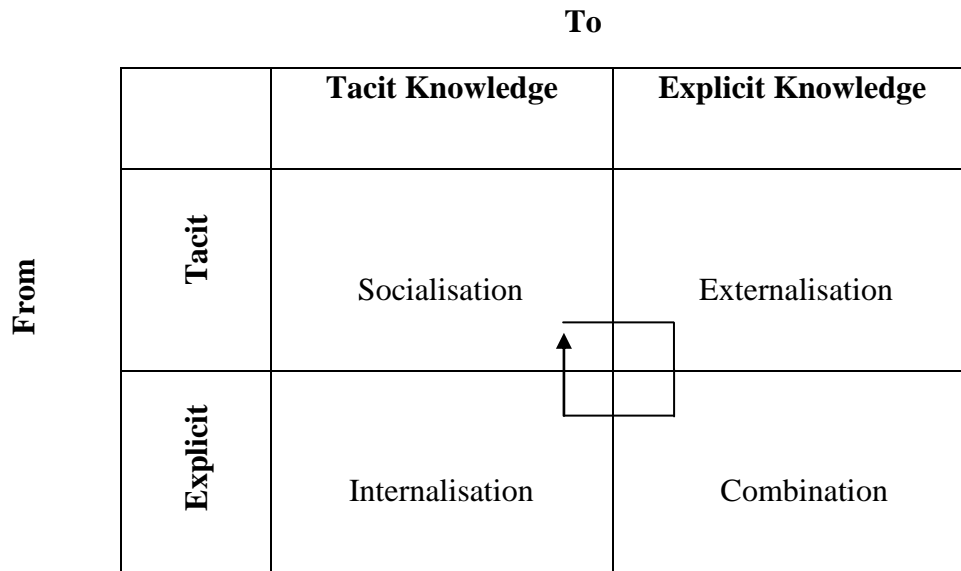
Figure 7: SECI model

(Nonaka, 1994, p.19)

Internalisation from explicit-to-tacit knowledge is achieved through generation of new ideas from written documents and learning. Nonaka and Toyama (2005) noted that this process can create understanding and develop a learning culture. They argued that when tacit knowledge is used by individuals it broadens the learning spiral of knowledge creation.

2.3.3 Knowledge management

KM is one of the concepts in management literature that has become popular in recent years. According to Seviby (1997), KM appeared for the first time in the context of artificial intelligence at the end of the 1980s. The early research on this concept was based on using information technology (IT) to support individual learning. After that, Drucker (1993) presented the concepts of the knowledge society and the knowledge worker, and argued that

the classical elements of production such as labour, capital and land had been replaced by knowledge. Prusak (2001) stated that the first conference discussing knowledge took place in 1993. It is argued that KM comprises three generations: the first generation is about information processing and transferring (Wiig, 1997). The second generation of KM focuses on knowledge creation and sharing (Nonaka, 1994). The third generation concentrates on the evaluation of the life cycle and value creation of knowledge assets (McElroy, 2003).

Bollinger and Smith (2001) discussed the development of KM from both the goal and the process angle. They claimed that it was focused on sharing information for the benefit of organisation. Chang and Lee (2008) described the aim of KM as being to enhance organisational performance and innovation. Similarly, Davenport and Prusak (1999) suggested that the application of KM in organisations reduces the cost and facilitates the sharing of organisational knowledge that helps with problem solving. It is argued that the benefits of using KM are that it aids decision making, reduces mistakes in the work of an organisation, develops innovation and enhances customer service and satisfaction (Ahmed and Shepherd, 2010, Chen and Huang, 2009). KM can leverage the competencies of organisations and help them achieve competitive advantage by promoting knowledge creation and innovation (Wei et al., 2009, Xu et al., 2010, Humayun and Gang, 2013). It provides access to expertise and know-how, and encourages a collaborative climate, and continual learning (Du Plessis, 2007).

KM is a coordinating mechanism that is used to convert resources into capabilities that in turn improve the performance of the organisation (Darroch, 2005, Hislop, 2009). It is concerned with the exploitation and development of knowledge assets and is vital for the adoption of new technology (Lin and Lee, 2005). A pilot study conducted by Zaied et al. (2012) in a variety of organisations in Egypt found that KM processes, namely acquisition, conversion, storing, and protection, can enhance organisational performance. Organisations

that effectively manage knowledge are better at translating their intellectual capital into innovative products and services (Chen and Huang, 2009, Huang and Li, 2009, Chen et al., 2010a). Thus, it has emerged as a leading paradigm and is regarded as an imperative for organisational success.

KM is described as a process of organising knowledge and making it available to decision makers (Liao and Wu, 2010). Massa and Tsesta (2009) saw KM as including people, process, technology and culture. Additionally, Yang (2011) described KM as a process of creating, disseminating, and applying organisational knowledge such as to exploit new opportunities and enhance the performance of the organisation. From Ipe's (2003) point of view, KM is a set of procedures, infrastructures, and technical and managerial tools that facilitate the creation, sharing, and application of knowledge within an organisation. Similarly, Bollinger and Smith (2001) defined KM as the activities used to generate, communicate and exploit usable ideas among organisational members for personal and organisational benefits.

The above definitions show that there is no universal definition of KM due to the different types of knowledge and the methods used to manage it. However, most of these definitions employ KS in different names as shown in Table1 such as sharing (Allee, 1997, Bock et al., 2005, Massa and Tsesta, 2009, Andreeva and Kianto, 2011, Awang et al., 2011, Ferraresi et al., 2012, Cui et al., 2005, Ling and Nasurdin, 2010, Huang and Li, 2009), dissemination (Bhatt, 2001, Gowen et al., 2009, Mehrabani and Shajari, 2012), conversion (Gold et al., 2001, Liao and Wu, 2010 , Allameh et al., 2012), transfer (Yahya and Goh, 2002, Uriarte, 2008, Kim and Ju, 2008), exchange (Nguyen and Mohamed, 2011) making it an important and primary process in KM. Therefore, this study focuses on KS processes, which will be discussed below.

Table 1: Review of KM processes

Author	KM processes
(Allee, 1997)	Knowledge creation (generation, and acquisition), retention (arrangement, storing, collection, presentation, analysis, and classification), sharing (socialisation, and distribution), innovation (changing, improvement, extension, and deepening)
(Bhatt, 2001)	Creation, dissemination, and utilisation
(Gold et al., 2001)	Acquisition, conversion, application, and protection
(Yahya and Goh, 2002)	Acquisition, documentation, transfer, and application
(Bock et al., 2005, Massa and Tsesta, 2009)	Capture, sharing, storage, and use
(Cui et al., 2005, Ling and Nasurdin, 2010, Huang and Li, 2009)	Acquisition, sharing and application
(Uriarte, 2008)	Creation, generation, transfer, and application
(Kim and Ju, 2008)	Generation, capture, storage, transfer, and use
(Gowen et al., 2009)	Acquisition, dissemination, and responsiveness
(Liao and Wu, 2010)	Creation, conversion and application
(Nguyen and Mohamed, 2011)	Exchange, socialisation, and internalisation
(Andreeva and Kianto, 2011, Awang et al., 2011)	Creation, documentation and storage, sharing, and application
(Allameh et al., 2012)	Knowledge conversion processes (socialisation, externalisation, combination, and internalisation)
(Ferraresi et al., 2012)	Capture, sharing, and use
(Mehrabani and Shajari, 2012)	Identification, creation, collection, organisation, storage, dissemination, and application

2.3.4 Why knowledge sharing?

In the literature concerning KM, researchers have confirmed the important role KS plays in the development of organisations (Shin, 2004). KS is a main focal point for KM and an important process in the life cycle of knowledge (Holsapple and Jones, 2004, Bock et al., 2005, Halawi et al., 2008, Tong et al., 2013). Yang and Farn (2009) indicated that tacit KS among organisational members is one of the most important issues for KM success. It plays a large role in increasing the competitive advantage of the organisation and is key to enhancing creativity (Davenport and Prusak, 1999, Saenz et al., 2009, Tan et al., 2010, Camelo-Ordaz et al., 2011). It is argued that innovation and effectiveness is more likely to be achieved in KM when KS is taken into consideration (Cummings, 2004, Zheng et al., 2009). Similarly, Sohail and Daud (2009) found that the outcome of KS is the generation of new knowledge and therefore the enhancement of organisational innovation. Through KS, organisations can develop their skills, and competence, and increase their value (Renzl, 2008).

Xiong and Deng (2008) found that effective KS increases the accumulation of organisational knowledge and develops the capacity of the employees to do their jobs and increase their self-knowledge. Bartol and Srivastava (2002) pointed out that KS among organisational members is an important instrument because it increases the value of knowledge utilisation. Similarly, Liao et al. (2004) and Willem and Buelens (2007) argued that performance in various parts of an organisation can be enhanced when organisational members communicate information, and share their insights, experiences, and lessons. KS is an effective indicator for measuring profit and efficiency (Behery, 2008). By practising KS activities, organisations can gain benefits, such as reducing the time needed for enhancing products and services (O'Dell and Grayson, 1998, Alavi and Leidner, 2001, Yang and Chen, 2007).

Additionally, Song (2002) stated that effective KS decreases the cost of training and reduces risk and uncertainty. It is argued that, through KS, individuals can improve their capacity to solve unstructured and complicated problems, reduce their mistakes and increase their learning (Reid, 2003, Saenz et al., 2009, Mughal, 2010, Kharabsheh, 2007). KS is a significant channel for translating individual knowledge into the strategic resources of an organisation (Hendriks, 1999). It is noted that KS is crucial for managers because it helps them to make decisions and encourages a culture of change (Vaccaro et al., 2010, Al-Omari et al., 2013).

Furthermore, many empirical studies have emphasised a positive relationship between KS and a number of organisational outcomes. For instance, scholars have found a link, with an organisation's innovation capability (Lin, 2007, Saenz et al., 2009, Chen et al., 2010a, Yang, 2011, Mehrabani and Shajari, 2012, Liao, 2006), organisational performance (Kang et al., 2008a, Gowen et al., 2009, Liao et al., 2011, Wang and Wang, 2012, Darroch, 2005, Kim et al., 2013), organisational effectiveness (Pai, 2006, Zheng et al., 2009, Yang, 2007a), job satisfaction (Tong et al., 2013) and organisational learning (Yang, 2007a, Massingham and Diment, 2009, Liao and Wu, 2009).

John (2001) asserted the importance of sharing knowledge within educational institutions such as universities. Similarly, Mathew (2010) indicated that the existence of knowledge and the promotion of a KS culture among teaching staff, can generate innovation and enhance educational performance. Daud et al. (2008) found that the exchanging of ideas, opinions, and experiences among faculty is critical for developing the learning process. Additionally, Cheng (2012) found that KS has the ability to enhance school learning capacity at both the individual and the organisational level, based on a study conducted within the Malaysian context. Similarly, Ma and Yuen (2011) argued that interaction and the promotion of a KS culture among students are vital components of their learning process. Zaqout and Abbas

(2012), again in the Malaysian context, found tacit and explicit knowledge to enhance educational performance, through the exchanging of lessons, notes, experiences, and projects among faculty.

2.3.5 What is knowledge sharing?

The literature on KM has adopted various terms to describe KS, such as knowledge exchange (Nguyen and Mohamed, 2011), knowledge diffusion or dissemination (Bhatt, 2001, Gowen et al., 2009, Mehrabani and Shajari, 2012), conversion (Gold et al., 2001, Liao and Wu, 2010 , Allameh et al., 2012), knowledge sharing (Bock et al., 2005, Cui et al., 2005, Ling and Nasurdin, 2010, Andreeva and Kianto, 2011, Ferraresi et al., 2012), and knowledge flows (Gupta and Govindarajan, 2000, Schulz, 2001).The term knowledge transfer has been used frequently in the recent literature on KM to described KS (Yahya and Goh, 2002, Uriarte, 2008, Massa and Tsesta, 2009). In this regard, some researchers, such as Boyd et al. (2007) and Berggren et al. (2011), have distinguished between the transfer and sharing of knowledge by arguing that knowledge transfer refers to the application of existing knowledge from one context to another. This assumes that the owner is the main source of knowledge and the transfer of knowledge occurs in one direction, from owner to recipient. KS, meanwhile, is a broader concept that includes the interaction, absorption, and creation of new knowledge, which means that KS occurs in two directions, and between two or more participants (see Figure 8).
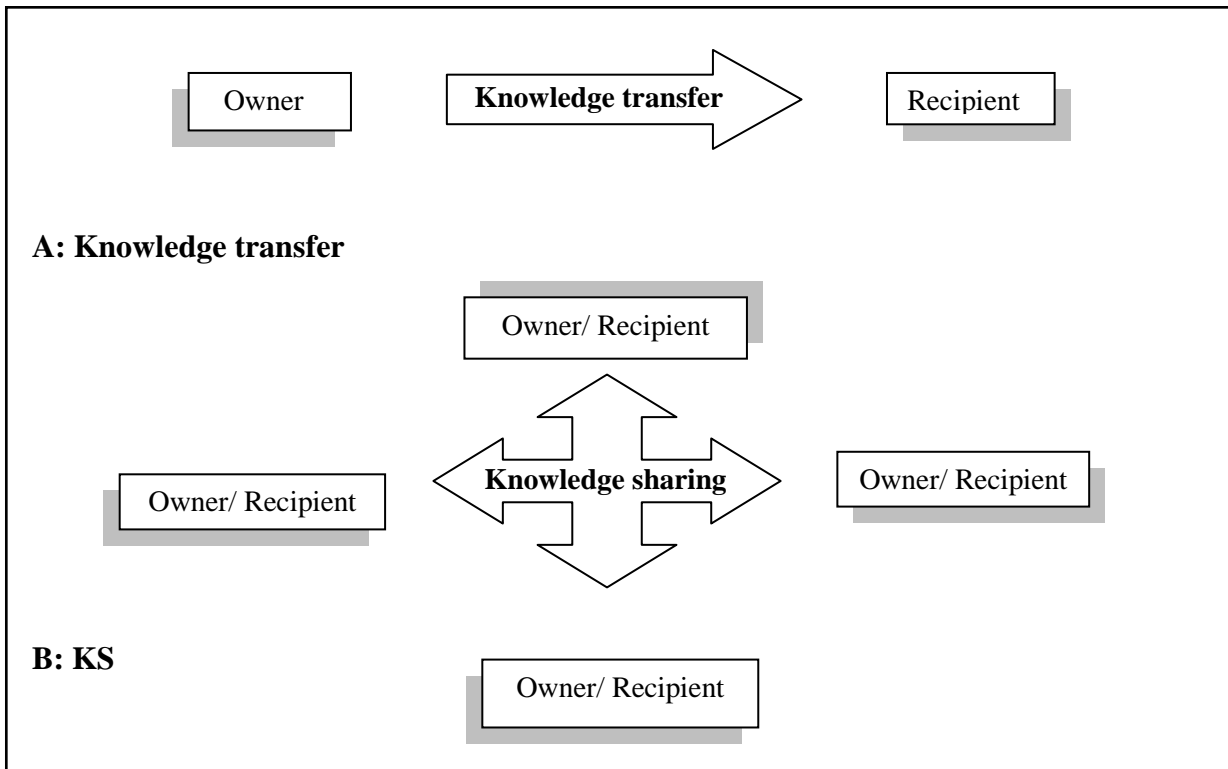
Figure 8: Difference between knowledge sharing and transfer

(Boyd et al., 2007, p.140)

However, many definitions and ideas have been posited by researchers and philosophers, leading to the wide variety of concepts of KS given in Table 2. For instance, some of the definitions assume that KS as activity (Dyer and Nobeoka, 2000, Bartol and Srivastava, 2002, Kim et al., 2013, Jahani et al., 2011, Lee et al., 2010, Hitam and Mahamad, 2012), others see it as a process from one person, group or firm to another (Darr and Kurtzbery, 2000, Argote et al., 2003, Ipe, 2003, Hooff and Ridder, 2004, Masrek et al., 2011), while others found KS is a culture or behaviour may occur formally among colleagues in a workplace or informally among friends and social networks (Bock et al., 2005, Lin, 2007, Xiong and Deng, 2008, Sohail and Daud, 2009).

Table 2: Definitions of KS

Author/s	Definition
(Dyer and Nobeoka, 2000)	KS is the activity of working to exchange knowledge among people and enable them to achieve their individual aims
(Darr and Kurtzbery, 2000)	KS is the process of helping people to acquire knowledge by learning from others' experiences
(Bartol and Srivastava, 2002)	KS is the activity of helping organisational members to share their data, information, ideas, experiences, and suggestions within the organisation.
(Argote et al., 2003)	"Is the process by which one unit is affected by the experience of another" (p.3)
(Ipe, 2003)	KS is the process of converting knowledge from individuals who possess it into individuals who accept and absorb it
(Hooff and Ridder, 2004)	KS is the process by which knowledge is exchanged and created at the same time
(Bock et al., 2005)	KS refers to the behaviour of individuals in sharing their knowledge with each other within an organisation
(Lin, 2007)	KS is a culture of social interaction that includes the exchange of knowledge, experiences, and skills among employees.
(Xiong and Deng, 2008)	KS refers to the exchange and communication of knowledge and information between members.
(Sohail and Daud, 2009)	KS represents the exchange and sharing of the events, thoughts, and experiences of people.
(Islam et al., 2010)	KS is the process of social exchange that occurs between individuals, from individuals to organisations, and from organisation to organisation.
(Lee et al., 2010)	KS refers to the interaction of tacit and explicit knowledge that is relevant to the task in hand
(Masrek et al., 2011)	KS is described as a process by which individuals mutually exchange their tacit and explicit knowledge and jointly generate new knowledge.
(Jahani et al., 2011)	KS includes the activities by which knowledge is transferred from one person, group, or organisation to another.
(Hitam and Mahamad, 2012)	KS is the exchange of knowledge, experiences, and skills among members through various departments in the organisation.
(Kim et al., 2013)	KS is the activity by which information, skills, and insights are exchanged among organisational members

Prior literature has reported different types of KS processes. For instance, Hendriks (1999) distinguished between the knowledge owners who have the knowledge and also called externalisation, and the knowledge receivers who receive the knowledge. Ardichili et al. (2003) proposed that KS includes a supply of new knowledge and a demand for new knowledge. Lin (2007) discussed KS as involving the carrier and the requester of knowledge.

From Kankanhalli et al.'s point of view (2005), KS processes consist of knowledge seekers and knowledge contributors. Weiss (1999) indicated that KS involves two processes: knowledge collection, which includes the accumulation, storage and recording of knowledge, and the connection of knowledge, which, consists of the knowledge seeker accessing a knowledge source and identifying the needed knowledge.

Additionally, Wei et al. (2009) divided KS processes into knowledge seeking and knowledge contribution. Similarly, Chen and Hung (2010) pointed out that KS consists of knowledge contributing, collecting, and utilising. Others, such as Ipe (2003), found that KS processes involve the transmission and absorption of knowledge. Kuo and Young (2008) noted that the transmission of knowledge includes sending knowledge to the recipients, while the absorption of knowledge reflects the effectiveness of knowledge use. Davenport and Prusak (2000) and Hussain et al. (2004) differentiate between the possession and acquisition of knowledge. Gupta and Govindarajan (2000) explained that KS includes the sourcing of knowledge, its transmission, receiving knowledge, and absorbing knowledge. Others researchers, such as Tong and Song (2011), have distinguished between voluntary and solicited knowledge. In the case of voluntary knowledge, individuals initiate the sharing (giving) of knowledge, while solicited KS occurs when individuals are asked by others or by an organisation to share their knowledge (receiving). Reid (2003), meanwhile, saw KS as encompassing a knowledge seller and a knowledge buyer.

However, this study agrees with Hooff and Weenen (2004), who divided KS processes into donating and collecting knowledge. These two processes have been studied by several researchers and tested empirically in different environments (De Vries et al., 2006, Lin, 2007, Kamasak and Bulutlar, 2010, Lin et al., 2009, Sandhu et al., 2011, Kim et al., 2013, Alhady et al., 2011, Chen and Hung, 2010, Tong et al., 2013). The donating of knowledge refers to the exchange process and communicating to others what one's personal intellectual capital is

(Hooff and Ridder, 2004, De Vries et al., 2006). It represents the willingness and eagerness of individuals in organisations to give and share their knowledge with others (Kim et al., 2013). It is argued that without willingness it is impossible for knowledge to be donated and transferred to others (Islam et al., 2010). This refers to the capacity of individuals to share what they know and to use what they learn (Lin, 2007). Knowledge donating refers to the owner of knowledge, and includes listening, talking to others, and providing them with information so as to help them develop their self-knowledge and solve problems more quickly (Reid, 2003, Cummings, 2004, Lin, 2007). Darroch and McNaughton (2002) noted that this type of KS process aims to convert personal knowledge into group and organisational knowledge. Thus, the organisation that creates an atmosphere that encourages organisational members to exchange their knowledge within the group is likely to develop new ideas and enhance organisational performance (Hooff and Weenen 2004, Nonaka et al., 2006, von Krogh et al., 2012, Hislop, 2013).

Knowledge collecting, on the other hand, refers to the recipient of knowledge who must consult colleagues through observation, listening or practising so as to encourage them to share their intellectual capital (Hooff and Weenen 2004, De Vries et al., 2006). It reflects the person's willingness to ask for, accept, and adopt new intellectual capital and know-how (Kim et al., 2013). Lin (2007) indicated that this process represents the acquisition of information and knowledge from internal and external sources. Knowledge collecting is a key aspect of organisations' success because the organisation with proficiency in gathering knowledge is more likely to be unique and rare (Lin, 2007). Knowledge collecting occurs when organisational members are willing to learn from others (De Vries et al., 2006). Senge (1998) stated that collecting knowledge means learning, absorbing, and applying it.

These two processes of KS promote trust and mutual respect as well as facilitate the flow of people's knowledge assets to be capitalised for performance development (Kamasak and

Bulutlar, 2010). It is argued that knowledge donating and collecting are linked with organisational learning because learning from others can help generate ideas and enhance organisational performance (Seba et al., 2012a). It is clear that the processes of knowledge donating and knowledge collecting have drawn the attention of some researchers but perhaps not enough and not in all contexts. Hence, for the purpose of this study and according to the objectives of the research, this thesis defines KS as "*a two-dimensional process, as described by Hooff and Weenen (2004) with members of staff sharing and exchanging their tacit and explicit knowledge. Daily interaction creates new knowledge through the process of knowledge exchange, donation, and collection*".

2.3.6 Knowledge sharing in public and private organisations and HEIs

There is increasing interest from researchers in studying KM and particularly KS in the public and private sectors. Tan et al. (2010) argued that KS processes play a great role in increasing competitive advantage. Bock and Kim (2002) found that KS among employees in Korean public organisations was related to their positive attitude towards KS. Cong and Pandya (2003) demonstrated that there is a lack of implementation of KM strategies in the public sector. Additionally, McAdam and Reid (2000) studied KM strategies in the public and private sectors. Their findings revealed similarities and differences across the sectors in terms of various dimensions of KM, namely, knowledge construction, embodiment, dissemination, and use. Eskildsen et al. (2004) indicated that the private sector has better systems of KM than the public sector. Connolly et al. (2005) asserted that leadership is one of the factors that affects KS in the public sector.

A qualitative study of 15 police officers in the UAE, carried out by Seba et al. (2012b), found that the main barriers to KS among employees were trust, organisational structure, and leadership style. Tong et al. (2013) studied a model consisting of three constructs within public organisations in Hong Kong: organisational culture, KS and job satisfaction.

Organisational culture included power distance, uncertainty avoidance, individualism, and masculinity. KS encompassed donating and collecting. Job satisfaction involved the work itself, payment, supervision, promotion, and co-workers. The findings uncovered that knowledge donating and collecting acted as a lever between organisational culture and the job satisfaction of the employees. Cong et al. (2007) found a lack of clear strategies for implementing KM in the public sector compared to the private sector. A survey of 242 employees within Malaysian private organisations, conducted by Hitam and Mahamad (2012), revealed that KS practice increased through the implementation of IT and reward systems.

Kim and Lee (2004) focused on two organisational factors, namely IT application, and reward systems, along with KS practices within the public sector. The results indicated the importance of KS and suggested that managers need to acknowledge these factors in government services. A recent study by Hock et al. (2009) demonstrated that KS is positively related to trust within public organisations. Another study of 355 managers working in service organisations in Malaysia found that organisational climate, namely a supportive and innovative atmosphere and decentralisation, was vital for KS (Islam et al., 2010). A study by Li et al. (2010) within private companies in China found organisational factors such as friendly relationships, innovation, and fairness to contribute to KS practices among employees. Abodulah et al.'s (2009) study indicated that reward systems, culture, trust, and IT facilitate KS among the employees of private companies in Malaysia. Renzl (2008) studied trust in management along with KS practices in private companies. The findings suggested that managers should support trust relationships in order to improve the flow of useful knowledge in the organisation. Tohidinia and Mosakhani's (2010) findings revealed that anticipated reciprocal relationships, perceived self-efficacy, and organisational climate were all antecedents to KS within public organisations in Iran.

Furthermore, both Al-Shammari (2010) and Zawawi et al. (2011) asserted that the main barriers to KS in the public sector are technology, and organisational rewards. Results from 486 employees of private hotels in Korea showed that knowledge donating and collecting act as levers between social capital, namely structural, rational, and cognitive capital, and organisational performance (Kim et al., 2013). Al-adaileh's (2011) study of private companies in Jordan suggested that cultural factors, namely trust, a collaborative working environment, a shared vision, and managerial practices, constitute an important part of promoting KS activities. Chawla and Joshi's (2010) Indian-based study showed that private organisations performed better than those in the public sector in understanding and using various KM dimensions, namely leadership in KM, a KM culture, KM technology, and KM measurement. Liao's (2006) findings demonstrated that KS act as a bridge between dimensions of learning in an organisation namely commitment to learning, a shared vision, open-mindedness, communication, and trust and firm innovation within Taiwanese private companies.

In the context of higher education, Ipe (2003) indicated that explicit knowledge refers to knowledge that can be codified or presented in written or audio-visual forms, such as notes, documents, books and databases that can used in teaching and learning situations to improve students' mastery of subject and educational performance. Al-hawamdeh (2003) stated that KS among students occurs through formal settings such as seminars and conferences, or informal settings such as casual face-to-face meetings and discussions. On the same topic, Kim and Ju (2008) mentioned that forms of KS within HEIs include lectures, seminars, colloquia, tutorials, and laboratory courses. Kumar et al. (2013) noted that the benefits of using KM within HEIs are that it: improves services for students, improves the service capability of the faculty and other staff, enhances services for alumni and other external constituents, increases competitiveness and responsiveness regarding research grants,

contracts, and commercial opportunities, reduces the turnaround time for research, develops internal and external services, and reduces administrative costs.

It is argued that the application of KM within schools not only provides a means for teachers to discuss different ideas regarding teaching and to exchange resources for student learning but also retains the expertise of experienced teachers, and increases their effectiveness regarding teaching and learning performance. It also supports the development of knowledge communities in schools and fosters a culture of learning (Leung, 2010). Similarly, Kumar et al. (2013) found that KM within HEIs can reduce product development cycle time and costs, lead to better decision-making capabilities, and improve academic and administrative services. The enhancing of research through KM technologies can help to cultivate future scientists. Similarly, Tian et al. (2009) argued that enhancing the scientific knowledge creation process in academia will have a significant impact on the whole community. KM within the academic environment can increase the quality and efficiency of education and research, by stated that KS among students occurs through formal settings such as seminars and conferences, or informal settings such as casual face-to-face meetings and discussions. On the same topic, Kim and Ju (2008) mentioned that forms of KS within HEIs include lectures, seminars, colloquia, tutorials, and laboratory courses. the best professors and researchers, through the development of new curricula, by improving cost efficiencies and exceeding the limits of time and space, thus allowing for the fulfilment of student potential (Omerzel et al., 2011).

Suhaimee et al. (2006) found an awareness of the implementation of a KS culture between staff in only 5 out of the 17 public universities studied. They suggested that incentives such as bonuses, job assessments and promotions could help to facilitate KS among staff. Mustafa and Abubakar (2009) conducted a survey of 137 students within one of the public universities in Saudi Arabia to determine the influence of a learning culture and IT use on students' KS.

The findings revealed that a learning culture contributes to increased KS. Meanwhile, Sohail and Daud (2009) showed that the knowledge and working culture play a vital role in increasing and facilitating KS among teaching staff within Malaysian private universities. Similarly, Zawawi et al. (2011) found the main barriers to KS among teaching staff in public universities in Malaysia to be a lack of knowledge self-efficacy, a lack of information and communication technologies (ICT), and a lack of reward systems. Kim and Ju (2008) revealed that reward system was the strongest factors affecting KS in a study of trust, openness in communication, collaboration, and communication channels among teaching staff within South Korean universities. A comparative study between public and private HEIs within the Malaysian context, carried out by Ramachandran et al. (2009), demonstrated that the practice of KM processes, namely creation, capture, organisation, storage, dissemination, and application of knowledge was better in private than public HEIs.

2.3.7 Knowledge sharing enablers

Lin (2007) described KS enablers as mechanisms that encourage employees' creation of new knowledge and sharing of it within the organisation. KS refers to a process that includes a set of concepts that help organisational members to obtain data and information within the organisation (Ipe, 2003). It is known to be a crucial factor for organisational performance and competitive advantage (Srivastava et al., 2006b, Kianto, 2011).

 KS occurs at two levels, the individual, and the organisational (Lin, 2007). At the individual level, KS occurs when organisational members talk and discuss things with each other. At the organisational level, KS means acquiring, arranging, utilising, and sharing experiences in such a way that the information resides within the organisation and is made available to others throughout the organisation (Darroch and McNaughton, 2002).

Although KS is considered to be of vital importance to organisations, it will not be achieved if there is a lack of KS culture (Wong, 2005). Lee and Al-Hawamdeh (2002) argued that KS is difficult to achieve because it is an unnatural act and will not happen automatically because individuals are reluctant to share their knowledge (Chiu et al., 2006, Coakes et al., 2008). According to Wong (2005), organisations need to consider the enablers of KS. It is noted that organisations that encourage their members to practice KS activities are likely to generate new ideas and create opportunities for improving learning performance, which is the core of innovation (Darroch and McNaughton, 2002). In this regard, the prior literature has identified several factors that promote a KS culture among employees. For instance, Lin et al. (2009) studied four constructs: culture, employee motivation, leadership, and IT. Culture included social networks, trust, a sharing culture, learning orientation, and rewards. Employee motivation consisted of reciprocal benefits, knowledge self-efficacy, enjoyment of helping others, and reputation. Leadership encompassed vision and goals, top management support, top management encouragement and an open leadership climate. IT consisted of technological infrastructure, databases, and a knowledge network. The study revealed that all dimensions of leadership are critical for KS practice.

Xiong and Deng (2008) found leadership style to be more effective in developing team spirit and a shared vision than either communication or training factors, within the context of Chinese joint ventures. A pilot study carried out by Khalid et al. (2012) showed that top management support and IT had stronger impacts on knowledge donating and collecting than enjoyment of helping others, knowledge self-efficacy, and reward systems, in public organisations in the UAE. Similarly, Tong et al. (2013) studied individual factors, namely enjoyment of helping others and knowledge self-efficacy, and organisational factors, namely top management support, and organisational rewards. They found top management to be the most effective enabler of KS.

Wong (2005) studied management leadership and support, culture, IT, strategy and purpose, organisational infrastructure, processes and activities, motivational aids, resources, training and education, and human resource management. The study revealed that management support and commitment from senior management contributed more to successful KM application than the other factors. Similarly, Long et al. (2012) and Humayun and Gang (2013) indicated that the most critical factor for promoting a KS culture is top management support.

Al-aLawi et al. (2007) focused on the link between organisational culture and KS, the former comprising trust, leadership style, communication between staff, information systems, reward systems, and structure, within the context of public and private organisations in the Kingdom of Bahrain. Their results uncovered the importance of leadership for KS in both sectors. Sandhu et al. (2011) found top management support to be one of the main barriers to knowledge donating and collecting within public organisations in Malaysia.

Based on the above review and other studies listed in Table 3, leadership style is the most critical factor in the successful cultivation of a KS culture. Thus, this study focuses on leadership style as an enabler of KS within the higher education sector, which discussed previously.

Table 3: Knowledge sharing enablers

Researcher/s	KS enablers
(Lin and Lee, 2006)	Climate – top management support
(Riege, 2005)	Organisational factors – lack of leadership and managerial direction
(Wong, 2005)	Organisational factors-management leadership and support
(Pai, 2006)	Organisational factors-top management leadership
(Lin, 2007)	Organisational factors-top management leadership
(Yang and Chen, 2007)	Culture -management support
(Kang et al., 2008a)	Support from the top management
(Behery, 2008)	Transformational and transactional leadership
(Aulawi et al., 2009)	Culture-management support
(Lin et al., 2009)	Leadership (vision and goals, top management support, top management encouragement, open leadership climate)
(Sandhu et al., 2011)	Management support
(Al-adaileh, 2011)	Organisational culture-managerial support
(Al-adaileh and Al-atawi, 2011)	Organisational culture-supervision support
(Xue et al., 2011)	Leadership style-empowering leadership
(Jahani et al., 2011)	Leadership roles-facilitator and mentor
(Seba et al., 2012a)	Organisational factors-leadership style
(Zwain et al., 2011)	Leadership commitment
(Porzse et al., 2012)	Organisational factors-senior management support
(Allameh et al., 2012)	Leadership style-transformational and transactional

2.4 Innovation

Today's organisations are increasingly focusing on innovation as a key factor in success and competitive advantage (Damanpour, 1987, Damanpour, 1991, Drucker, 1993, Damanpour and Gopalkrishnan, 2001, Harrison and Samaon, 2002, Schilling, 2005, Schilling, 2010, Tidd and Bessant, 2011). Innovative organisations have the capacity to improve individual and organisational performance and solve problems by effecting change and creating opportunities for them (Redmond and Mumford, 1993, Drazin et al., 1999, Walker, 2007, Varis and Littunen, 2010). It is argued that innovative behaviour is essential if organisations are to adapt and respond to rapid and unstable environmental and technological changes and survive in the present environment (Kellermanns et al., 2008, Cooper and Edgett, 2009, Trott, 2008). There is a general agreement among scholars that innovation is power for organisations all nowadays (Kamasak and Bulutlar, 2010).

Innovation is the most important element underlying an organisation's long-term competitive advantage (de Jong and Hartog, 2007). Lagrosen (2005) noted that innovation can provide entry to new markets and enhance the effectiveness of organisations. It is a primary source of economic growth, providing organisations with opportunities to grow faster and gain profits (Tidd et al., 2005, Trott, 2008, Tidd and Bessant, 2011). Calantone et al. (2002) and Jimenez and Vall (2011) both indicated that innovation is related to organisational learning, makes organisations aware of the latest developments, and helps them to absorb new and related knowledge. Therefore, organisations that have the capacity to be innovative will be able to respond to challenges and exploit new product and market opportunities more quickly than non-innovative organisations (Schilling, 2010).

Innovation has several attributes that include the combination of inputs in the creation of outputs: the inputs of innovation can be tangible, such as technology infrastructure,

production materials, and production machinery, or intangible, such as patents, databases, R&D progress, organisational processes, knowledge and skills (Damanpour et al., 2009).

2. 4.1 What is innovation?

It is difficult to give a simple definition of innovation, although the concept has gained attention from a number of researchers and scholars. However, researchers have defined it in different ways and from different angles as either a consequence or a process. According to De Jong (2006), the concept appeared for the first time in the literature when Shumpeter (1934) described it as the creation of new products/services, brands and processes, and their impact on economic development. Nystrom (1990) found innovation to be new products/services, and processes that aim to improve the competitive advantage of the organisation and meet customers' changing demands. White and Glickman (2007) stated that the term innovation refers to the introduction of new ideas, methods, and devices. Liao et al. (2008) gave a broader definition, describing it as the generation/adoption of novel ideas, and behaviours regarding products, services, production, operating procedures, and management strategies. Similarly, Daft (1978) and Herkema (2003) both defined innovation as the adoption of new ideas, behaviours, products, systems, processes, policies, and programmes that are new to an organisation. Du Plessis (2007) stated that innovation refers to the creation of new thoughts, knowledge and ideas so as to make organisational outcomes possible. Additionally, Vaccaro et al. (2012) explained innovation as a product, process, or distribution method perceived as new by the organisation.

Other researchers have expanded the definition of innovation. For instance, Albury (2005) saw it as creating and implementing new products/services, processes, procedures and methods of delivery that enhance the effectiveness of the organisation. From Amabile's (1998) point of view, innovation meant the successful implementation of creative ideas within an organisation. Van de ven (1986) explained that innovation as a process includes the

generation, adoption, and implementation of new ideas and practices. Chen and Tsou (2007) found innovation to be the intuition, adoption, and implementation of new ideas or activities used to develop products, services or work practices. Additionally, innovation can be understood as developing, generating, adopting, and implementing new ideas, methods, programmes, and policies so as to achieve the goals of an organisation effectively (Kamasak and Bulutlar, 2010, Nusair et al., 2012). Meanwhile, Tidd et al. (2005) indicated that innovation refers to change that includes the creation of new knowledge and its commercialisation.

These definitions explain innovation as a process that include multiple patterns, stages, or phases, and either the creation or the adoption of a new idea. Indeed, the creation process is different from the adoption process. The former covers all activities from creating new ideas, to developing them, to transferring them so that they can be used by others (Van de ven, 1986). On the other hand, the adoption process includes initiation, decision adoption and implementation (Damanpour and Aravind, 2012).

In the literature of innovation there is some overlap between the concepts of creativity, innovation, and change. Creativity, or invention, refers to the generation of novel and appropriate idea by individuals or groups. It is the ideation component of innovation, and merely a concept, thought or collection of thoughts (Amabile, 1998, Schilling, 2005, Trott, 2008). It is the first step and is necessary for innovation but not sufficient (Tidd and Bessant, 2011). Schilling (2010) noted that creativity can occur at both the individual and the organisational level. At the individual level, creativity occurs through intellectual abilities such as the ability to look at problems from different angles and analyse them, knowledge, style of thinking, and from personality traits such as self-delicacy, tolerance for ambiguity and willingness to overcome obstacles and reasonable risks. On the other hand, creativity at the organisational level includes the creativity of individuals within the organisation and

different social processes (Ahmed and Shepherd, 2010). Innovation includes the personal, creation of ideas (creativity-invention), their commercialisation, and their application into new products/services, processes, or devices (Trott, 2008, Tidd and Bessant, 2011) (see Figure 9). It requires combining a creative idea with resources and expertise so as to embody the creative idea in a useful form (Smith 2009, Schilling, 2010).
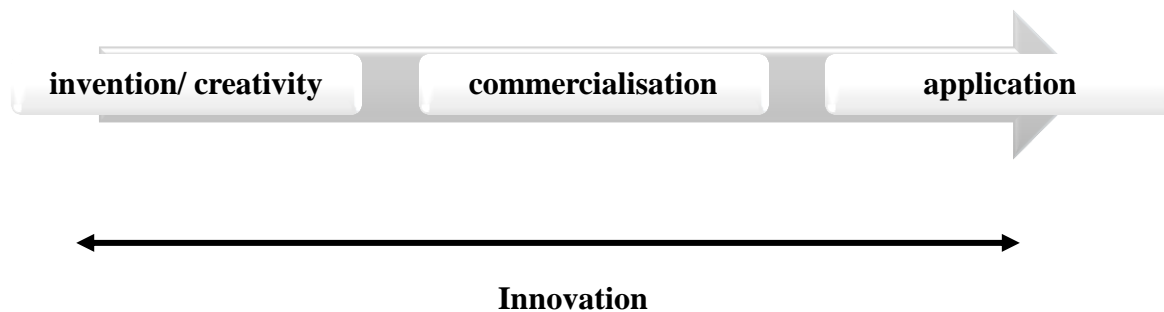
Figure 9: Invention and innovation

(Developed from Smith, 2009, p.9)

With regard to change, all innovation in organisational terms is assumed to mean change, but not all change is innovation (Trott, 2008). It is noted that many organisational changes occur without intentionality of direct benefits but are simple adjustments in response to routine changes in internal and external environmental conditions (West and Farr, 1990). For the purposes of this study, a more comprehensive definition of innovation will be given at the end of this chapter.

2.4.2 Types of innovation

Damanpour et al. (2009) indicated that it is important to identify different types of innovation in order to understand organisations. Different types of innovation are reported in the literature. The early distinction between the types of innovation can be traced back to

Schumpeter (1983), who identified five types: new products, new methods of production, new markets, new sources of supply, and new ways to organise business. Other researchers (Daft, 1978, Subramanian and Nilakanta, 1996, Birkinshaw et al., 2008, Jaskyte, 2011) have distinguished between technological and administrative innovation. Technological innovation refers to the implementation of organisational affairs through tools such as new equipment, methods, concepts, elements of processes, techniques, and systems. It is directly related to the primary work activities of organisations (Damanpour and Schneider, 2006). On the other hand, administrative innovation includes the development and implementation of the organisation's activities, such as organisational structure, administrative processes, and changes in the social system that consists of organisational members and relationships among them (Walker, 2007, Schilling, 2010). It includes rules, procedures, management systems and staff development programmes (Trott, 2008, Jaskyte, 2011, Damanpour and Aravind, 2012). Smith (2009) noted that administrative innovations are indirectly related to the work activities of an organisation.

Damanpour (1987) and Damanpour et al. (2009) added to technological and administrative innovation ancillary innovations, which refer to community service programmes such as development programmes. Other researchers (Damanpour, 2009, Smith 2009, Tidd and Bessant, 2011) have argued that innovation can be achieved through both product and process. Product innovation refers to the introduction of new products or service, while process innovation includes the development of new tools and equipment. Tidd et al. (2005) and Tidd and Bessant (2011) classified innovation into product, process, position, and paradigm innovation. They argued that position innovation includes changes in the context in which the products are introduced, while paradigm innovation encompasses the changes in the underlying mental models that reflect the work of the organisation. Additionally, Schilling (2005-2010), distinguished between incremental and radical innovation.

Incremental innovation involves the extension or modification of existing products or processes. It is usually classified as market-pull innovation and provides opportunities to build on the existing know-how (Trott, 2008). The changes are typically improvements to components, rather than major changes (Ahmed and Shepherd, 2010, Tidd and Bessant, 2011). Smith (2009) noted that this type of innovation can create an essential linear process of continuous change. Radical innovation, on the other hand, refers to the newness and degree of differentness in the product or process. It is crucial to long-term success, non-linear and discontinuous, as it includes the development and application of new technology (Tidd and Bessant, 2011). Thus, it puts the organisation at risk because it is more difficult to commercialise (Du Plessis, 2007).

He and Wong (2004) argued that innovation can be achieved through exploitation or exploration. Exploitation refers to refinement, implementation, efficiency, and production, and is short-term, while exploration encompasses behaviour characterised by research, discovery, experimentation, flexibility, and risk-taking, and covers a longer period of time. Koch and Hauknes (2005) identified five types of innovation within service organisations: product, delivery, process, system, and strategy. They described product innovation as focusing on the features and design of products and services. Delivery innovation includes new ways of providing a service and communicating with clients. Process innovation refers to the development of policies, procedures, and organisational forms. System innovation encompasses developments in ways of communicating with others. Strategy innovation includes changes in the mission, strategy, and rationales of the organisation. Similarly, Hamel (2006) saw innovation as encompassing process innovation such as customer services, and logistics, and management innovation such as strategic planning, project management and employee assessment.

Wang and Ahmed (2004) and Trott (2008) both divided innovation into product, process, organisation, management, commercial which refers to the application of new marketing strategies such as the packaging of the firm's product, and channels for distributing products to the market, and behaviour, which includes changes in employee behaviour for the better. Walker (2007) distinguished between total innovation (providing new services to new users), expansionary innovation, and evolutionary innovation, which refers to delivering a new service to existing users. Damanpour and Schneider (2006) defined organisational innovation as a type of innovation that includes product, process and administrative innovation.

It is clear from the discussion above that there are various types of innovation, which vary according to the viewpoint of the researcher and their field of research. This study focuses on product and process innovation, which will be explained in the following sections.

2.4.3 Why product and process innovation?

Robbins (2001) stated that innovation could be used to enhance organisational performance. It is also argued that at the heart of all types of innovation are product and process (Trott, 2008). Prior literature has reported that product and process innovation is essential for organisations as it gives them the capability to solve problems, add value and improve performance (Cooper, 1998, Damanpour and Gopalkrishnan, 2001, Schilling, 2005, Ahmed and Shepherd, 2010). Liao et al. (2008) suggested that these two dimensions could determine an organisation's success or failure. They noted that product innovation is followed by process innovation, as part of an industry innovation cycle. Similarly, Tsai et al. (2001) claimed that the influence of product and process innovation can enhance the adaptability of organisations to environmental change and that they are present in organisations where problem solving and creativity thrive. Dannels (2002) and Bi et al. (2006) indicated that product and process innovation enable organisations to realise competitive advantage. It is argued that, through these types, organisations can reduce the costs of production and become

more efficient (Harrison and Samaon, 2002, Mansury and Love, 2008). Chen et al. (2012) noted that technical innovation that encompasses both product and process innovation has the ability to improve production and distribution processes. Organisations with greater product and process innovation capabilities can achieve a better response from the environment and more easily build the capabilities needed to enhance organisational performance (Jimenez and Vall, 2011). Product innovation can respond to unstable environment and create new opportunities for developing effectiveness (Matzler et al., 2008). It is one of the critical success factors for organisational growth and increased profits (Schilling, 2005-2010). Liao and Wu (2010) asserted that the two types of innovation that have gained the most attention and been studied empirically the most in the innovation literature are product and process innovation (see Table 4):

Table 4: Review of product and process innovation

Researcher/s	Product	Process
(Damanpour and Gopalkrishnan, 2001)	√	√
(Prajogo and Sohal, 2003)	√	√
(Wang and Ahmed, 2004)	√	√
(Chuang, 2005)	√	√
(Darroch, 2005), (Du Plessis, 2007)	√	---
(Liao, 2006)	√	---
(Lin, 2007), (Liao et al., 2007)	√	√
(Amara et al., 2009)	√	√
(Damanpour et al., 2009)	√	√
(Abu Bakar and Ahmad, 2010)	√	---
(Liao and Wu, 2010)	√	√
(Yang, 2011)	√	---
(Jimenez and Vall, 2011)	√	√
(Chen et al., 2012)	√	√
(Shu et al., 2012)	√	√
(Ooi et al., 2012)	√	√
(Frishammar et al., 2012)	----	√
(Bohlmann et al., 2013)	√	----
(Im et al., 2013)	√	----

Skerlavaja et al.(2010) stated that innovation can be understood through product and process. Menguc and Auh (2006) argued that product and process innovation make organisations proactive in exploring new opportunities in addition to exploiting their current strengths

Furthermore, several empirical studies have provided evidence of the important effects of product and process innovation on performance attributes such as profitability, growth, and effectiveness. For instance, Morales et al. (2006) found technological innovation, namely product and process, to be a bridge between leadership and performance within pharmaceutical companies in Europe and America. Vicente-Lorente and Zuniga-Vicente (2012) revealed that the adoption of process innovation, such as new methods and the development of equipment, has had a positive impact on the workforce within industrial companies in Spain. A survey of 121 managers of electronics companies in Thailand, carried out by Ussahawanitchakit (2012), showed that product and process innovation have the ability to improve competitive advantage, profitability, and performance. Additionally, a study by Pianta (2005) found that managers of organisations feel obliged to make decisions about product innovation in order to increase the quality and variety of their products. Jimenez and Vall (2011) found both product and process innovation to affect firm performance. In the context of European museums, Garrido and Camarero (2010) suggested that product innovation could enhance social performance.

2.4.4 Product innovation

Product innovation is embodied in the outputs of an organisation. It is associated with the success of organisations and allows them to establish a dominant position in the competitive marketplace (Danneels and Kleinschmidt, 2001, Schilling, 2010). The prior literature has defined product innovation from different perspectives. For instance, Stefanovitz et al. (2010) indicated that product innovation refers to the development of new products that help the organisation to achieve its goals. Cooper (1998) and Cooper and Edgett (2009) found product

innovation to represent the novelty of new products introduced to the market in a timely fashion. From Damanpour's (2009) viewpoint it includes new products/services introduced so as to meet an external user or market need. Product innovation is the process by which firms produce and develop new products that can lead to organisational success (Valencia et al., 2010). For Hage and Hollingsworth (2000), product innovation refers to the systematic work process, drawing on existing knowledge gained from research and practical experiences, directed towards the production of new materials, products and devices including prototypes.

Tasi (2001) described product innovation as the introduction of new products or services to the market in order to satisfy customers. It represents the changes that an organisation offers to the outside world (Damanpour and Schneider, 2006, Schilling, 2010). Trott (2008) noted that this type of innovation is linked to the primary activities of the organisation and can create opportunities for the organisation in terms of expansion into new areas. It can help the organisation to deal with turbulent environments and is considered an important driver of organisations' success in dynamic markets (Tidd et al., 2005, Damanpour, 2009, Cooper and Edgett, 2009, Hung et al., 2010, Ooi et al., 2012).

Product innovation has been measured from different perspectives. For instance, Tsai (2001) measured it by looking at the profitability and diversity of the products. Murovec and Prodan (2008), on the other hand, focused on the number of products, and the speed of innovation. Product innovation can be measured by the share of sales of products or new services adopted in the last three years (Ooi et al., 2012). Alternatively, Vicente-Lorente and Zuniga-Vicente (2012) studied product innovation using the number of product innovations introduced to the market. Prajogo and Sohal (2003) focused on the number, speed, and level of product innovations. Within Spanish private companies, Bornay-Barrachina et al. (2012) discussed product innovation through the number of improvements and new products developed by a company. Additionally, Gumusluoglu and Ilsev (2009) analysed product innovation in

Turkey through the coefficient of innovation tendency, and the success of product innovation. The first criterion represented the ratio of sales generated by product innovation to total sales, whereas the latter was the ratio of sales generated by innovation to expenditure in producing those innovations. Correa et al. (2007) focused on the number of new and changed products introduced to the market. Faems et al.(2005), Jaskyte and Kisirliene (2006), Obendhain and Johnson (2004), and Skerlavaja et al. (2010) all studied product innovation by the number of new products the organisation had introduced. Ussahawanitchakit (2012) focused on the new procedures, and processes within the organisation that influenced the speed and flexibility of production, and on the quality of the production. Pullen et al. (2012) measured product innovation as those products that were new to the developing organisation and new to the market.

2.4.5 Process innovation

Schilling (2010) indicated that process innovation aims to increase the effectiveness of organisational processes so as to facilitate the production and delivery of goods and services to the customers. Damanpour and Aravind (2012) explained that this type of innovation has an internal focus and is primarily efficiency driven. Wang and Ahmed (2004) argued that process innovation is not often explicitly discussed in the literature, despite being a valuable tool that can help organisations to survive in competitive markets, and is usually considered a sub-element of technical innovation (Damanpour, 2009). It is imperative to overall innovative capabilities and less risky and costly than other innovations (Wang and Ahmed, 2004, Hull and Liao, 2006). Process innovation is addressed by the following researchers:

- Perri 6 (1993) defined process innovation as the introduction of new methods so as to facilitate the production of goods and services.

- Afuah (1998) indicated that it refers to the introduction of new items into an organisation's operations, such as input specifications, equipment, work, and information.

- According to Boer and During (2001), process innovation means a change in the way the organisation produces and delivers its offerings.

- Wong and He (2003) found it to be the development of new production processes using new equipment and the reengineering of operational processes.

- Jaskyte (2004) considered it to be the creation of new modes of service and delivery.

- Wang and Ahmed (2004) found process innovation to refer to the introduction of new production, methods, new technologies used to improve production, and new management processes.

- It is also described as the implementation of a new production or delivery method that encompasses changes in techniques, equipment and software (Bi et al., 2006, Tidd and Bessant, 2011).

- Process innovation is also said to be a change in the carrying out of an organisation's tasks and targets (Ahmed and Shepherd, 2010).

- According to Ooi et al. (2012), it covers organisational aspects that include the improvement of internal operations and capacities.

Prior literature has reported different types of process innovation. For instance, Perri 6 (1993) noted that process innovation can be classified into practice and technique-related process innovations. Practice-related process innovations include equipment, and labour administration. Technique-related process innovations, on the other hand, refer to the use of new approaches and new communication methods between organisational members. Perri 6 stated that there are two sub-elements of technique-related process innovation: intra-technique that refers to a new use for the same computer in the training of members, and

inter-technique innovation that encompasses the introduction of new inputs. Gehlen (1980) distinguished between organisation, and technology process innovation. Organisation process innovation includes new market and internal company organisation, while technology process innovation refers to human artifacts that cover instruments and machine. Johannessen (2008) identified two types: continuous and radical process innovation. Damanpour et al. (2009) differentiated between technical and administrative process innovation. Technical process innovation encompasses new elements such as equipment, techniques, tools, and systems that are introduced into an organisation's production system. They argued that this type of process innovation can increase operational flexibility and decrease the costs of production. Administrative process innovations, on the other hand includes the motivation and rewarding of organisational members, the enhancement of the structure of tasks, and the modification of an organisation's management processes (Daft, 1978, Birkinshaw et al., 2008). Similarly, Hamel (2006) distinguished between operational and management process innovation. The first included customer services, logistics and procurement, whereas, the second referred to strategic planning, project management and employee assessment.

Avlonitis et al. (1994) measured process innovation according to the introduction of new machinery and methods. Yang (2010) discussed it from the point of view of the level of process innovation and the number of potential applications or the innovation. Ooi et al. (2012) focused on production lead time and employee productivity. Vicente-Lorente and Zuniga-Vicente (2012) studied the acquisition and improvement of new equipment and new methods. Within private companies in China, Shu et al. (2012) discussed process innovation through improvements in manufacturing or operational processes and economies in resource consumption. Similarly, Jimenez and Vall (2011), studied changes in process and the introduction of new processes in Spanish industrial organisations.

2.4.6 Innovation in public and private organisations and HEIs

The importance of innovation is recognised in both public and private organisations and is considered the main force for organisations' survival (Smith 2009). Tidd and Bessant (2011) argued that innovation plays a great role in increasing competitive advantage. Shu et al. (2012) found that innovation, namely product and process, was related positively to knowledge creation and business and political ties within private companies in China. Additionally, Bornay-Barrachina et al. (2012) pointed out that employment relationships, specifically, professional managerial duties, and personal work ethics, can lead to the improvement and introduction of new products through human capital in private organisations in Spain. Within private Dutch medical device companies, Pullen et al. (2012) found that network characteristics, namely cultural capital, strategic capital, social capital and resource capital, can improve and introduce new product innovation. Focusing on a sample of Spanish public organisations, Jimenez and Vall (2011) showed that innovation of both product and process can encourage and enhance organisational learning. Carmen and Jose (2008) introduced a framework consisting of three constructs, market orientation, innovation, and performance, in order to study cultural organisations in Europe. Market orientation includes visitor, donor, and competitor. Innovation encompasses technological and organisational, while performance includes economic, social, and comparative performance. The study found innovation to play a pivotal role between market orientation and performance.

In higher education environments, innovation is important and it has been said that universities should rely on product and process innovation (Jaskyte, 2004). Rogers (1995-2010) asserted that educational institutions were a way to adopt and apply innovation. Educational quality is reliant on both product and process being adaptive to the changing environment. Therefore, it is necessary to study these two types of innovation within the

higher education environment (Obendhain and Johnson, 2004). Albury (2005) found that innovation has the ability to improve the learning outcomes and quality of the provision of education. It is argued that innovations in the educational system can help customise the educational process (Brodhag, 2013). There is a general consensus that education has a positive impact on the well-being of communities, families and individuals (OECD, 2009). Thus, innovation within the higher education sector is considered the main engine of economic and social development. Chen and Chen (2008) noted that innovation in HEIs could be achieved through the of academic results.

The literature has reported that different types of innovation appear within private and public HEIs. For instance, Hsiao et al. (2009) and Chen et al. (2010b) suggested that innovation appears in seven different areas within public universities and technical institutions in Taiwan: leadership, administrative operations, student affairs, curricula and instruction, teachers' professional development, resource applications and the campus. They argued that leadership innovation includes vision, campus administration development, and participation in decision-making. Administrative operations innovation encompasses the organisational culture, administrative measures such as the adoption of new polices that could improve organisational performance, and service quality.

Student affairs refer to competitive events, innovative club activities, and life counselling. Curriculum and instruction innovation consists of innovation regarding course content, teaching materials, and teaching itself. Teachers' professional development innovation includes professional studies, action research, and teachers engaging in technical R&D tasks and publishing. Resource application innovation encompasses technical qualifications and development, industry-academia collaboration, and external resources. Finally, campus innovation includes innovative campus design, educational facilities such as providing the

equipment and space teachers' need to engage in innovative teaching, and the innovative provision of library resources.

Similarly, Chen and Chen (2008) distinguished between technical and managerial innovation within different universities in Taiwan. They indicated that technical innovation consists of academic innovation such as research patents, academic communication, and publishing in journals, and administrative innovation refers to outsourcing, and affair rotation. Managerial innovation, on the other hand, encompasses member innovation (i.e. refresher classes), marketing innovations such as number of conferences, and organisational structure innovation such as whether the institute is a learning organisation.

Others researchers, such as Getz et al. (1997), have mentioned that innovation in HEIs may comprise computing telecommunications, libraries, student life, financial services, the curriculum, and classroom services. Additionally, the OECD (2009) saw innovation in educational environments as including the introduction of new products/services such as curricula, new processes for the delivery of services, the use of (ICT) in e-learning services, new ways of organising activities such as using ICT to communicate with students and colleagues, and new marketing techniques (e.g. the pricing of postgraduate courses).

Several empirical studies have been carried out to stimulate innovation within public and private HEIs. For instance, Rahimi et al. (2011) found that the creativity of faculty members within public universities in Iran could be enhanced through knowledge creation, namely socialisation, externalisation, combination, and internalisation. Su et al. (2009) noted that technical can provide an important source of basic scientific knowledge that is critical for product and process innovation. A survey of 612 employees within private universities in Jordan, conducted by Al-Saudi (2012), found that creative behaviours, namely problem solving, the ability to change, a risk-taking attitude, communication capacity, and the

encouragement of innovation were positively related to the organisational climate. Additionally, Youssef et al. (2013) studied the accumulation of e-skills and innovative capacities among teachers within public vocational high schools in Tunisia. The study found that computer and internet skills, the effective use of ICT, and facilities all play an important role in the innovative pedagogical use of ICT. Bjornali and Støren (2012) found individual competences, namely communication and championing, professional and creative qualities, and productivity and efficiency, increase the probability that higher education graduates introduce innovation at work to develop their educational performance such as participation in research projects and problem-based learning.

Based on the discussion above, and in line with the objectives of the research, this study defines innovation as *"accepting, developing, and implementing new products such as courses, research projects, teaching materials, curricula, and processes by developing and using new technology, good financial management, and the continuous improvement of skills".*

2.5. Summary

This chapter has provided a theoretical background about TL, KS, and innovation. Researchers have studied the concept of leadership for several years leading to various schools of leadership theory, such as the trait, and style approaches, situational, contingency, and path-goal theory and TL and transactional leadership. It was found that from the review Bass's TL is appropriate for practising in the organisations particularly in academic environment, as it strengthens the followers' capacity to achieve goals by giving them the resources to do their jobs. TL is a process by which a leader can change the followers using idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, so as to increase individual and organisational performance.

Knowledge has become one of the key economic resources and is seen as an intangible asset, which distinguishes it from data and information. It was found there is a debate of tacit knowledge (know-how) and explicit knowledge (know-what). Since knowledge is important as an intangible asset, the idea of KM is crucial. Researchers saw KM can allow access to expertise and encourage a collaborative climate with continual learning. It appears from the literature that KM not only involves managing explicit and tacit knowledge but also aids in decision-making and helps to reduce mistakes at work. It was noted that, when considering the application of KM initiatives, it is important to create a culture of KS.

KS is crucial as it can increase the capacities of the members of an organisation to do their jobs, and their self-knowledge. Most of the researchers and philosophers agreed that KS is a process of social interaction that includes the exchange of knowledge, experiences, and skills among organisational members. In light of this, knowledge donating and collecting were found to be important elements for both public and private organisations and within the HEIs as they can improve both academic and administrative services. There are a number of factors found in the literature to stimulate KS culture among members like individual, organisational and technological but the most important KS enabler appeared is leadership style.

Finally, the chapter reviewed the concepts regarding innovation. This part indicated that most studies in management remain interested in understanding why some organisations demonstrate a greater level of innovation than others. The literature review presented a debate about types of innovation. This chapter then presented the fundamental reasons for studying product and process innovation in this piece of research concluded that HEIs are producers and users of innovation, and emphasised the need for studying innovation within the domain of education. The ultimate aim of the literature review chapter was to provide a theoretical background in order to develop a conceptual framework presented in the following chapter.

CHAPTER THREE: THE CONCEPTUAL FRAMWORK AND HYPOTHESES OF THE STUDY

3.1 Introduction

Findings from the literature review in the previous chapter suggest an opportunity for further research. It was found that TL and KS are critical factors to enhance innovation in the organisations particularly in a learning environment. As a result, there is a need to examine such relationships in higher education environments.

This chapter highlights the research problem to be investigated in this thesis and describes the conceptual model for this study. It describes the relationship between TL-innovation, TL-KS, and KS and innovation. The mediating role of KS in the TL- innovation relationship is discussed. Then TL in public and private organisations and HEIs are described in this chapter before ending with the hypotheses of the study.

3.2 Transformational leadership and innovation

Eisenbeib and Boerner (2010) reported that TL acts as a lever to facilitate innovation. To enhance product and process innovation, organisations require commitment and must encourage communication among their members (Lee et al., 2006). Transformational leaders can encourage followers to act on an organisation's vision in order to foster innovation (Chen et al., 2012, Si and Wei, 2012). Such leaders have an interactive vision and the capability to encourage an appropriate environment for product and process innovation (Saenz, 2011, Vaccaro et al., 2012).

Transformational leaders with idealised influence are able to build trust and respect among employees, express confidence in the organisational vision, instil admiration and commitment, share the risks with followers, and emphasise the importance of having a

collective sense of the organisation's mission (Betroci, 2009, Yukl, 2010). These characteristics, encourage members to work hard and be more innovative (Bass and Riggio, 2012, Bass, 1985). By practising inspirational motivation, leaders can motivate the followers around them to achieve the required performance by creating a climate of collaboration and teamwork (Sadler, 2003). They shape the vision, gain optimistic commitment to that vision, pay maximum attention to fostering effective communication and the sharing of values, and encourage an appropriate environment for innovation (Saenz, 2011, Daft, 1999, DuBrin, 2007). It is found that this style of leadership boosts members' perceptions of the importance of and values associated with desired outcomes that will improve their performance (Bass, 1985).

By providing intellectual stimulation, transformational leaders encourage the imagination and creativity of their followers, so that they re-examine some of their assumptions and old ways of doing things. They are encouraged to reformulate and think about old problems in new creative ways (Northouse, 2007, Western, 2008). Followers under this style of leadership are not afraid of being criticised if they express a different opinion to their leaders (DuBrin, 2012). When individuals are encouraged to re-think, and know that their ideas are considered important by their leaders, they are more likely to come up with innovative ideas that could enhance product and process innovation (Shalley and Gilson, 2004, Jung et al., 2008). Using individualised consideration, transformational leaders build individual relationships with their followers, and consider their needs, skills, abilities, and aspirations in such a way that facilitates innovation (Bass and Riggio, 2006, Yukl, 2010). They help their subordinates to realise their own competence through encouragement, support, and feedback (Northouse, 2007). Transformational leaders listen to and care about their followers' ambitions, and contributions, and show them how they can reach their goals (Saenz, 2011). This style of leadership can increase the desires of members of an organisation to take on more

responsibility. When leaders are concerned with their followers' personal feelings, and offer support and encouragement, the followers will be more likely to respond with innovation (Al-omari and Hung, 2012, Khan et al., 2009, Gumusluoglu and Ilsev, 2009).

Previous literature has linked leadership with innovation. For instance, Si and Wei (2012) studied the impact of TL on followers' creative performance in large multinational companies in China. They found that a team empowerment climate moderated the relationship between the two variables. Al-omari and Hung (2012) showed that transformational leaders with high emotional intelligence heighten organisational innovation. A study of 416 employees in the R&D departments of industrial companies in Germany, conducted by Eisenbeib and Boerner (2013), demonstrated that transformational leaders have the ability to promote followers' creativity. However, there is a decrease in creativity when the followers are dependent on the leader. Sookaneknun and Ussahawanitchakit (2012) introduced a framework for enhanced innovation within Thai companies. Their framework had four main constructs: enablers of TL, TL, innovation, and firm performance. The enablers of TL were self-efficacy, emotional intelligence, and learning competency. The TL construct encompassed idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration. The innovation capability construct included product, process, technology, management, market, systems, and firm performance constructs. The study found a positive effect between the inter-relationships of the framework. Among the four dimensions of TL, only idealised influence had an effect on organisational innovation and performance.

Additionally, Vaccaro et al. (2012) found that transformational leaders who inspired team success and developed trusting and respecting relationships in Dutch firms enabled those firms to make changes in management innovation, mainly: regarding practices, processes, and structures. Morales et al. (2008) examined the mediating role of innovation in the relationship between TL and performance in pharmaceutical organisations in the US. They

found that TL through idealised influence, inspirational motivation, and intellectual stimulation had a positive direct effect on performance and an indirect one through product innovation. Their framework was also tested in the context of small and medium enterprises (SMEs) in Austria and was found to be significant (Matzler et al., 2008).

Jung et al. (2008) investigated the moderating effects of organisational culture, structure, and environment on the relationship between TL and innovation. The organisational culture construct consisted of a climate for innovation and empowerment. Organisational structure encompassed centralisation, and formalisation. Environmental factors included uncertainty and competition. The findings supported the direct effect of TL on organisational innovation and revealed that the moderating effect was in the opposite direction to that hypothesised. Michaelis et al. (2010) demonstrated that TL can enhance innovation through promoting commitment to change. Jung et al. (2003) studied the moderating role of followers' psychological empowerment, namely: meaning, competence, self-determination and impact on the relationship between TL and innovative behaviour within Taiwanese companies. The study revealed that TL is positively related to innovative behaviour within an environment of high psychological empowerment. The model was later tested in the context of government agencies in the Netherlands and produced the same results (Pieterse et al., 2010).

A survey of 523 organisational members working in Pakistani companies, carried out by Tip et al. (2012), indicated the important role TL plays in developing innovation both directly and indirectly through organisational culture. de Jong and Hartog's (2007) found that leaders who use consulting, delegating, and supporting behaviour are essential to the generation and application of ideas by employees. Zhang and Batrol (2010) supported this idea, revealing that empowering leadership affects organisational creativity. Sarrors et al. (2008) argued that leadership with vision and that provides individual support has the capacity to build a climate to support innovation. Additionally, Al-yasseri (2006) showed that strategic leadership and

organisational innovation, namely: the ability to solve problems and make decisions, the ability to change, a spirit of risk taking, and the encouragement of innovation, is essential for performance within Iraqi companies.

Scanning the literature, research on the TL and innovation relationship within the HE environment is limited. Yahchouchi (2009) examined the perceptions of 158 employees of Lebanese universities regarding transformational and transactional leadership and their impact on employees' organisational commitment. The results showed that leaders practise the former style more than the latter and that it has a positive relationship with commitment. A survey of 200 faculty members in one of the public HEIs in Jordan, carried out by Alzawahreh (2011), suggested that TL behaviour exhibited by superiors played an important role in enhancing the creativity of the faculty members. Moolenaar et al. (2010) demonstrated that TL is essential for an innovative climate in elementary schools.

Sagnak (2012) conducted an empirical study of 710 teachers and 55 principals in elementary schools. The results indicated that empowering leadership has the ability to enhance teachers' innovative behaviour, namely idea generation, diffusion and application. Recent studies carried out by Khasawneh et al. (2012) and Chang (2012) demonstrated that TL increased the productivity of teachers at vocational schools in Jordan and Taiwan, respectively.

However, these studies focused on the effects of leadership in enhancing innovation, but did not examine how the four components of TL behaviour specifically affect innovation, particularly among members of staff working on product and process development. In particular, very little empirical research has examined the existence of such links (Mumford et al., 2002) within developing countries, and there is a call for research in this area in the HE sector (Bodla and Nawaz, 2010).

3.3 Transformational leadership and knowledge sharing

Fullwood et al. (2013) indicated that KS plays an important role in the competitiveness of an organisation. It is believed that organisations will become more effective through creating, sharing, and reusing knowledge (Nguyen and Mohamed, 2011). KS refers to the interaction between implicit and explicit knowledge that is relevant to the task at hand (Lee et al., 2010). According to Bollinger and Smith (2001), organisational culture plays an important role by enabling organisational members to work together and share their knowledge. It is also argued that TL is able to promote and cultivate norms and values that encourage KS (Bryant, 2003, Eisenbeib and Boerner, 2010). Such leaders can create a collaborative team environment, and encourage communication, negotiation and the sharing of knowledge (Bass and Riggio, 2006, Northouse, 2007).

Transformational leaders with idealised influence instil admiration, respect, pride, and faith, and tend to emphasise the importance of having a collective sense of the organisation's mission (Bass and Riggio, 2012). They promote emotions such as integrity, honor, and a sense of selflessness in their followers (Avolio and Bass, 2002, Northouse, 2012). Such leaders can encourage followers to accomplish their work based on a collective sense of beliefs, values and purposes (Betroci, 2009). It is noted that this style of leadership can inspire among followers and leaders trust and loyalty, which are the core components of KS (Hsu et al., 2007, Hock et al., 2009, Shih et al., 2012). Research has found that employees working under leaders who focus on trust and who involve them in making decisions feel comfortable sharing their knowledge and expertise in their organisation without fear or suspicion (Tse and Mitchell, 2010). When members feel that their leaders have confidence in them, trust in their capabilities, care about their work and appreciate their efforts to create knowledge such as new ideas, they will be more willing to give their opinions and are more likely to share knowledge (Lee et al., 2010).

Employees working under leaders practising inspirational motivation are encouraged to achieve the organisational vision because of the individual and team spirit that is created and are inspired to lead task-oriented commitment through sharing that vision (Saenz, 2011). They display enthusiasm, optimism and inspire other members to imagine the attractive future state that could be achieved (Bass and Riggio, 2006). TL exhibiting this behaviour builds a collaborative climate among members, providing them with direction and energy. Such leaders can encourage KS through communication, dialogue, and negotiation (Northouse, 2007).

When they exhibit intellectual stimulation, transformational leaders generate different ways of thinking, challenge followers' assumptions, and seek new solutions to problems from multiple perspectives. Leaders who promote discussion, reviews, and the open sharing of ideas are more likely to encourage KS activities (Carmeli et al., 2011). When transformational leaders facilitate the search for new opportunities and the establishment of a common vision among employees, the employees' sense of responsibility will increase along with their KS (Senge et al., 1994, Chen and Barnes, 2006).

Leaders using individualised consideration are aware of their followers' needs and concerns as individuals and develop their strengths through coaching and consulting, providing advice and hands-on guidance to their followers (DuBrin, 2007). Transformational leaders behave as mentors, aiming to foster social interaction and help their followers to develop job-related competencies by showing them empathy and consideration (Bass and Riggio, 2012). They enhance self-efficacy and self-confidence, thereby providing them with opportunities to share their unique knowledge. Such leaders can provide support and recognise the value of the contributions and ideas of their followers (Yukl, 2013). Leaders who consider the unique knowledge of their members and listen to their views are more likely to motivate them to share their knowledge with others (Srivastava et al., 2006b).

Previous literature has studied TL from different contexts. For instance, Song et al. (2012) introduced a model and tested it within Korean profit organisations. Their model had three main constructs: TL, employees' work engagement, and knowledge creation. The TL construct included idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration. The construct of employees' work engagement encompassed vigour, dedication, and absorption. The knowledge creation construct consisted of KS, creating concepts, justifying concepts, building archetypes, and cross-level knowledge. The study found that employees' work engagement plays a significant mediating role in explaining the influence of TL on knowledge creation.

Al-adaileh and Al-atawi (2011) examined the impact of organisational culture, namely openness to change, innovation, trust, teamwork, morale, information flow, involvement, supervision, customer service, and rewards on knowledge exchange within the context of a Saudi telecommunication company. The findings of the study suggested that organisations require supervisors' commitment so as to create an environment in which employees are able to share knowledge and apply it. A survey of 73 individuals working in software development organisations in China, carried out by Humayun and Gang (2013), found that supportive leadership has the ability to stimulate the intentions of employees to seek knowledge through knowledge management systems (KMS). Additionally, Shih et al. (2012) detected that TL can increase R&D workers' knowledge exchange behaviour through the effect of a trusting climate in their study of Taiwanese electronic product manufacturers. Analoui et al. (2013) studied transformational, transactional, and laissez-faire leadership and their relationship with KM activity in (ICT) organisations in the UK. They found the first two styles to be important for the application of KM.

Nguyen and Mohamed (2011) introduced four constructs to investigate the moderating role of organisational culture on the relationship between, transformational transactional leadership

and KM. The organisational culture construct included adaptability, mission, and hierarchy. The TL variables were idealised influence, and individualised consideration. Transactional leadership encompassed contingent rewards, active and passive management by exception and laissez-faire management. The KM construct consisted of the exchange of knowledge, socialisation, and internalisation. The study found that idealised influence and contingent rewards types of leadership behaviour have a significant influence on all dimensions of KM processes. This suggested that the effectiveness of TL is highly dependent on contextual factors such as the organisational structure and the degree of power sharing. According to the results, organisational culture had a significant moderating effect on the relationship between transactional leadership and KM.

Furthermore, Seba et al. (2012b) found that, within public organisations in the UAE, the main barriers to the practising of KS activities among employees were trust, the organisational structure, and the leadership style. Meanwhile, Singh's (2008) findings suggested that consulting and delegating behaviours exhibited by leaders are positively associated with knowledge creation and application.

Tse and Mitchell (2010) studied TL and knowledge creation theoretically, and suggested that open-mindedness norms can constitute a supportive environment that facilitates the relationship between TL and knowledge creation. A pilot study conducted by Chen and Barnes (2006) of 93 managers working in professional services firms in Taiwan and 72 in the US showed that leaders who encourage and enhance problem solving and pay more attention to their employees are more likely to improve KS. In addition, TL was found to be more important than transactional leadership in terms of encouraging KS activities among employees in private companies in the UAE (Behery, 2008).

In the HE sector, Vera and Crossan (2004b) demonstrated that transformational leaders encourage individuals to break through boundaries and share their experiences within and across departments. Meanwhile, Mathew (2010) argued that a lack of leadership support is the main barrier to knowledge in HEIs, making it difficult to use knowledge and share data and information effectively. Suhaimee et al. (2006) found that 80% of KM is achieved through people, particularly leaders and culture, while 20% is achieved through technology.

Jahani et al. (2011) examined the effects of reward systems and leadership styles such as being a mentor and facilitator on KS activities within Iranian universities. Their results showed that HE needs reward systems and leaders who play a mentoring role in order to encourage staff to practise KS behaviour. Xue et al. (2011) investigated the impact of team climate variables, namely trust, cohesion, and innovativeness, and empowering leadership, which included leading by example, participative decision making, coaching, informing and showing concern, on team members' knowledge behaviour, among a sample of college students at a major US university. Their findings suggested that team climate and empowering leadership are essential for KS practice and for the removal of barriers to sharing.

Allameh et al. (2012) revealed that TL, namely using employees' talents, increasing employees' enthusiasm, transmitting the organisation's mission and encouraging entrepreneurship, increase the knowledge conversion processes of socialisation, externalisation, combination, and internalisation more than transactional leadership, in a sample of faculty members of Iranian public universities.

Although, the above studies have looked at the relation between TL and KS, research on TL has not fully examined the mechanisms through which TL shapes employees' performance and behaviour (Yukl, 2010), and there is a call for research into how leadership affects KS in

public and private organisations (Leidner and Alavi, 2006) within developing countries (Jahani et al., 2011).

3.4 Knowledge sharing and innovation

The knowledge-based view recognises that knowledge is a valuable resource of organisations (Nonaka and Takeuchi, 1995, Nonaka and Toyama, 2005). The role of knowledge and KM has emerged as an important area in the investigation of innovation in organisations (Spender, 1996, von Krogh et al., 2012). When considering the application of KM initiatives, it is important to create a KS culture (Hislop, 2013). KS is a process that includes the exchange and sharing of tacit and explicit knowledge among members. It is noted that knowledge is the core component of innovation (Goh, 2005). Through KM processes, and particularly KS, organisations can create opportunities to generate new ideas and develop innovation (Reid, 2003, Lin and Lee, 2005, Willem and Buelens, 2007).

Access to knowledge may help organisational members to come up with new ways to solve problems and engage in further innovative activities (Rodan and Galunic, 2004). Product and process innovation are shown to solve problems and improve performance (Cooper, 1998, Tsai, 2001). Innovation depends on employees' knowledge, skills, and experience of value creation (Wang and Wang, 2012, Skerlavaja et al., 2010). New knowledge is critical to developing innovative ideas for new products (Tsai, 2001). The knowledge-based view suggests that organisations need to exhibit knowledge creation but more importantly KS (Alavi and Leidner, 2001). Since knowledge is embedded in individuals, it is necessary for it to be shared among organisational members so that they can establish new routines and mental processes that may help them to solve their problems (Cheng, 2012, Nonaka et al., 2006, Nonaka and Takeuchi, 1995). When organisational members share their tacit knowledge and convert it into explicit knowledge through collecting and donating, collective learning is generated, which in turn improves the stock of knowledge available to the

organisation (Nonaka and Toyama, 2005, Alavi and Leidner, 2001, Lin, 2007). It is argued that organisations that promote a KS culture among organisational members are likely to generate new ideas that lead to product and process innovation (Tsai, 2001, Dougherty et al., 2002, Michael and Nawaz, 2008, Mehrabani and Shajari, 2012). Through knowledge activities, employees can reconfigure and utilise existing knowledge in new ways so as to change and develop their tasks, which in turn generates new knowledge that can be used for product and process innovation

Previous studies have reported that KS is an antecedent of product and process innovation. For instance, Darroch and McNaughton (2002) suggested that KM processes, namely the acquisition, dissemination, and responsiveness of knowledge, could accelerate radical and incremental innovation within companies in New Zealand. Meanwhile, Jantunen (2005) found that knowledge dissemination does not have a significant relationship with innovation, while knowledge application plays an important role in supporting innovation. Huang and Li (2009) tested a model with three constructs in Taiwanese firms. These constructs were: social interaction, KM processes, and innovation. The social interaction construct included trust, communication, and coordination. The KM processes were acquisition, sharing, and application. Innovation encompassed administrative and technological aspects. Their results revealed that social interaction helps organisational members to accumulate social capital and increases knowledge sharing and application, which in turn develops innovation.

Andreeva and Kianto (2011) examined the effect of knowledge processes, namely creation, documentation and storage, sharing, acquisition and intensity, on innovation performance. The study highlighted that knowledge creation can predict product, management and marketing innovation. Holsapple and Jones (2004) found that the acquisition of knowledge can help firms to create new products. In the same context, Ling and Nasurdin (2010) demonstrated that knowledge acquisition has a positive effect on product innovation, while

the sharing and application of knowledge have no relationship with the latter. A survey of 327 individuals working in Taiwanese IT and financial firms was carried out by Liao and Wu (2010) to examine the relationships among aspects of KM namely acquisition, conversion, and application, the organisational learning variables of management commitment, system perspective, and openness and experimentation, and the innovation dimensions of product, market, and strategic. The study concluded that there is an indirect effect of KM processes on innovation through organisational learning.

Liao et al. (2007) found that absorptive capacity, namely employees' ability and motivation, acted as a bridge between knowledge donating and collecting and product and process innovation within industrial companies in Taiwan. The authors studied the moderating effect of organisational climate, comprising an innovative climate and a supportive climate, and organisational structure, namely formalisation, centralisation and integration, on the relationship between knowledge creation and sharing, and technological and administrative innovation. Chen et al. (2010a) identified a positive relationship between knowledge creation and sharing and innovation in a supportive climate that stimulates and encourages the transfer of knowledge into innovation, while organisational structure attenuated the relationship. A qualitative study conducted by Porzse et al. (2012) within professional services firms in Eastern Europe found knowledge to have a unique connection with innovation and suggested that collective organisational knowledge could stimulate innovation.

Furthermore, Ferraresi et al. (2012) showed that the KM processes of capturing, sharing, and application had a significant impact on innovation through strategic orientation within Brazilian companies. Wei and Xie (2008) found that KM could improve innovation performance within industrial companies in China. Similarly, Kamasak and Bulutlar (2010) demonstrated that knowledge collecting had more effect on exploitative and explorative

innovation inside and outside departments than did donating knowledge in the context of industrial companies in Turkey.

An empirical study of 449 employees working in banking and insurance firms in Taiwan was carried out by Liao et al. (2012). The study investigated the mediating role of organisational learning (commitment to learning, shared vision and open-mindedness) on the relationship between organisational culture (bureaucratic, innovative, and supportive) and knowledge acquisition (internal creation, and external acquisition) as independent variables, and organisational innovation (product, market, behavioural, and strategic) as the dependent variable. It found that an enterprise needs to learn while acquiring knowledge in order to achieve organisational innovation.

Yang (2011) examined the interrelationships among internal KS, the external acquisition of knowledge, and product innovation within software firms in China. The findings implied that external knowledge acquisition can enhance firms' product innovation more than internal KS. Additionally, a pilot study of 209 employees within high technology firms in China, conducted by Wang and Wang (2012), found that the speed and quality of innovation mediated the relationship between tacit and explicit knowledge and operational and financial performance. Hung et al. (2010) indicated that knowledge creation, sharing, transfer, and application positively influence the speed, amount, and level of innovation through total quality management (TQM). Lin and Lee (2005) demonstrated that firms that applied strategies such as sharing technological knowledge with competitors achieved higher performance than those that did not share knowledge. Aulawi et al.'s (2009) survey of 125 employees working in Indonesian telecommunications companies indicated that KS acts as a lever between social, and technical factors and individual innovation capability.

Within an educational environment, very few studies look at the KS innovation relation. Zaqout and Abbas (2012) found that explicit and tacit knowledge formed a bridge between trust, social networks, (ICT) and performance in Malaysian public universities. Cheng's (2009) findings suggested that KS via interpersonal interaction and communities of practice is essential to improving teaching practice and curriculum implementation. The most recent study was conducted in the context of Iraqi public universities by Zwain and Teong (2012). The study looked at KM processes, namely identification, acquisition, storage, sharing, and application, in relation to academic performance. The findings revealed that KM processes, particularly the sharing of knowledge, are essential for academic performance.

Although previous studies have looked at the relationship between KS and innovation, few touch on knowledge processes and their impact on the teaching staff's product and process innovation (Subramaniam and Youndt, 2005), and there is a need for research addressing the practical difficulties of KS for product and process innovation (Xu et al., 2010) within developing countries and particularly the Iraqi environment.

3.5 The mediating effect of KS in the TL-innovation relationship

The linkages between TL and KS discussed in section (3.5.2), and those between KS and innovation discussed in section (3.5.3), implicitly suggest that TL affects innovation via its effects on KS. Enhancing product and process innovation requires leaders to cultivate respect, admiration and commitment among organisational members (Saenz, 2011, Bass and Riggio, 2006, Avolio et al., 1999, Betroci, 2009).

Knowledge is the key to innovation in organisations. Innovation is a process of defining problems and creating new knowledge to solve them (Nonaka et al., 2006, Damanpour et al., 2009, Ahmed and Shepherd, 2010). Tacit knowledge is embedded in different individuals and has to be converted into explicit knowledge. KS processes followed by organisational

members help them to convert the knowledge, create new routines and mental models, and solve problems (Nonaka and Takeuchi, 1995, Nonaka, 1994, von Krogh et al., 2012). To fully leverage the knowledge and exchange the skills and experiences that reside in individual minds, TL can encourage and promote a KS culture among employees through idealised influence by instilling admiration, trust, faith and respect among organisational members (Saenz, 2011, Northouse, 2007). Through inspirational motivation, leaders can create team spirit by encouraging commitment and communication (Northouse, 2007, Tichy and Devanna, 1990, Yukl, 2010). When leaders practise intellectual stimulation, members are encouraged to think, look, and seek out new approaches to old problems. Using individualised consideration, leaders are able to pay special attention to their followers, encouraging them to solve their problems (Bass and Riggio, 2006, Northouse, 2007).

According to the knowledge-based view, when knowledge can be shared among organisational members through donating and collecting, the stock of knowledge will be made available, and this will help to generate new ideas, which in turn can improve product and process innovation (Liao and Wu, 2010 , Ferraresi et al., 2012, von Krogh et al., 2012, Wang and Wang, 2012). Therefore, this study argues that TL encourages a KS culture among members of staff through idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration. Tacit knowledge is converted to explicit knowledge about teaching operations and administrative issues among faculty members through the donating and collecting of knowledge, and this will lead to innovative ideas for developing the product and process innovation of the university.

Although TL may affect innovation directly, previous research has suggested that the direct effects may be too complex to isolate (Srivastava et al., 2006b). Insufficient attention has been given to the mechanisms that may explain these relationships, and research is needed to address and understand the processes through which TL influences work related to

innovation. Therefore, this study aims to fill the gap in the literature by examining the effects of TL on innovation through the mediating role of KS, as shown in Figure10.

3.6 TL in the public and private sectors and in HEIs

TL is a management practice that has become increasingly dominant in both public and private organisations (Walumbwa et al., 2005). TL can realign and change followers' norms, and promote both personal and organisational change in the public and private sectors (Bass and Riggio, 2006, Northouse, 2007, Saenz, 2011). Previous literature has reported mixed results from comparing TL in public and private organisations. For instance, Lowe et al. (1996) found that TL behaviour is at least as common and effective in public organisations as private. Similarly, Wright et al. (2012) indicated that leadership can increase goal clarity among the employees of public organisations. Mohammad et al. (2011) found that leaders using inspirational motivation, intellectual stimulation, and individualised consideration were able to create an environment that increased job satisfaction among the employees, within Jordanian private hospitals.

Khan et al. (2012) examined the relationship between transformational, transactional, and laissez-faire leadership and innovative work behaviour in public and private banks in Pakistan. The study found that managers in the public banks practised TL, while those in the private sector tended to use transactional leadership. The findings also revealed a positive relationship between both TL, and transactional leadership, and innovation, while laissez-faire leadership was found to have a negative effect on innovative work behaviour. Gilley et al. (2008) showed that TL practice in public and private organisations is important for successful change and innovation. Additionally, Riaz and Haider (2010) demonstrated that transformational and transactional leadership is essential for career satisfaction and job success within private organisations in Pakistan. A comparative study on the effectiveness of

TL within private and public banks in India, carried out by Majumdar and Ray (2011), detected the same level of TL in both sectors.

An empirical study of 266 employees within private and public hospitals in Kuwait, conducted by Al-mailam (2004), found that the level of TL increased the job satisfaction of the employees in the private sector more than those working in public hospitals. Janadghi et al. (2009) showed that TL plays a central role in success and increases the job satisfaction of employees in Iranian private companies.

In HE sector, TL has been found to encourage staff to participate in educational programmes that develop their skills so that they achieve higher performance (Bass and Riggio, 2006). It is argued that, within academic environments, TL can lead to changes in the organisational culture, strategies and structures similar to those seen in business organisations (Yu and Jantzi, 2002). Singh and Lokotsch (2005) argued that TL can create an atmosphere among teachers within public primary schools that encourages communication and teamwork, and suggested that the principals of these schools should change from their traditional style to one of TL.

A survey of 458 teaching staff working in Malaysian public universities was carried out by Lo et al.(2010) to examine the effects of various TL dimensions, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, on commitment to change measured by personal goals, capacity belief, and context belief. It found that idealised influence and intellectual stimulation were significantly related to commitment to change. Similarly, Khasawneh et al.'s (2012) findings suggested that TL was necessary for commitment among vocational teachers within governmental schools in Jordan. A pilot study of 154 teaching staff within Malaysian private and public universities

conducted by Nawaz and Bodla (2010) found no differences in the TL practices exhibited by the faculties of the two sectors.

Judeh (2010) studied gender differences in transformational leaders' behaviours, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration in private universities within the Jordanian context. The findings revealed no significant differences between female and male transformational leaders' behaviours in terms of intellectual stimulation. An empirical study was conducted by Trivellas and Dargenidou (2009) to investigate the impacts of different leadership roles, namely producer, director, coordinator, monitor, facilitator, mentor, innovator and broker, on the quality of services among faculty and administrative staff within technological educational institutes in Greece. The findings revealed that the innovator role was the strongest role in terms of its effect on members of the faculty, while the coordinator role was a stronger predictor of the quality of services among administrative staff. Recent studies (Pihie et al., 2011, Sadeghi and Pihie, 2012) conducted in public universities have demonstrated that perceived TL behaviours exhibited by heads of departments significantly and positively affect staff members' job satisfaction.

As shown above, previous research has been conducted TL in public and private environments. Very few studies, however, have focused on the differences between the TL practices used in the two sectors.

This study also examines the sectoral differences in the pattern of relationships between TL, KS and innovation. Knowing the differences, if any, between public and private HEIs is critical, as these differences should be taken into account in order to develop management strategies that will work best for each sector. While there are a great number of studies examining TL, KS and innovation, as discussed in Chapter 2 and section 3.5.5 of this chapter,

there is a lack of empirical studies of the impact of TL on KS and innovation and the impact of KS on innovation. To the author's knowledge, there is no study comparing the levels and predictors of TL and KS and their effects on innovation between the public and private sectors, particularly in Iraqi HE environment.
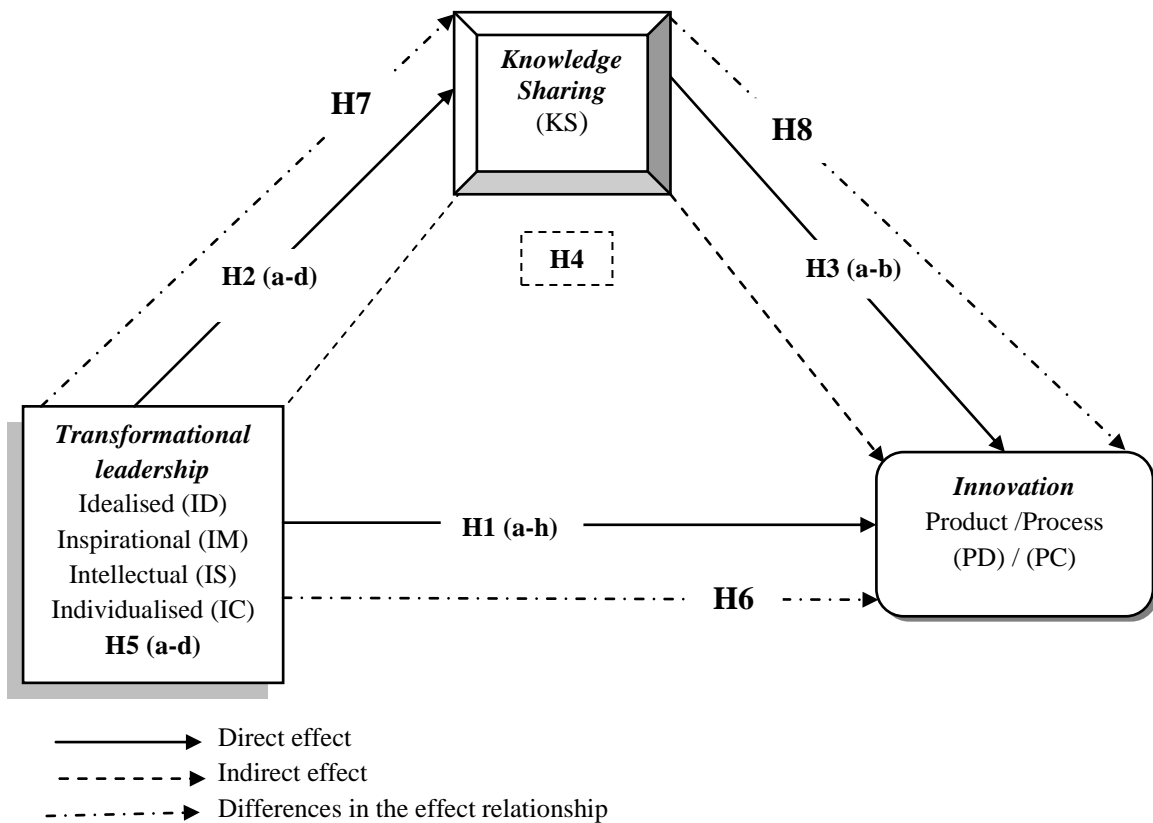
Figure 10: The research model

This study develops a model to fill the gap in the literature and to address unknown issues concerning TL, KS, and innovation and the differences between public and private HEIs in this regard. Figure 10 shows that there are four aspects of the model: 1) the direct relationship between TL and innovation; 2) the direct relationship between TL and KS; 3) the direct relationship between KS and innovation; 4) the indirect relationship between TL and innovation through the mediating effect of KS. The study further examines the differences in TL practice and the effect relationships among TL, KS, and innovation between public and

private HEIs. According to the four relationships listed above, the study examines the hypotheses proposed in the following section.

3.7 Hypotheses of the study

The conceptual framework of this study leads to the following hypotheses:

According to the discussion in section (3.2), this study suggests the following hypothesis:

H1: TL will positively influence product and process innovation in Iraq's public and private HEIs.

This leads to the following sub-hypotheses:

- *H1a*: Idealised influence will positively influence product innovation in Iraq's public and private HEIs.

- *H1b*: Inspirational motivation will positively influence product innovation in Iraq's public and private HEIs.

- *H1c***:** Intellectual stimulation will positively influence product innovation in Iraq's public and private HEIs.

- *H1d:* Individualised consideration will positively influence product innovation in Iraq's public and private HEIs.

- *H1e***:** Idealised influence will positively influence process innovation in Iraq's public and private HEIs.

- *H1f:* Inspirational motivation will positively influence process innovation in Iraq's public and private HEIs.

- *H1g:* Intellectual stimulation will positively influence process innovation in Iraq's public and private HEIs.

- ***H1h:*** Individualised consideration will positively influence process innovation in Iraq's public and private universities.

According to the discussion in section (3.3), this study expects:

H2: TL will positively influence KS in Iraq's public and private HEIs.

This leads to the following sub-hypotheses:

- ***H2a:*** Idealised influence will positively influence KS in public and private HEIs in Iraq.

- ***H2b:*** Inspirational motivation will positively influence KS in public and private HEIs in Iraq.

- ***H2c:*** Intellectual stimulation will positively influence KS in public and private HEIs in Iraq.

- ***H2d***: Individualised consideration will positively influence KS in public and private HEIs in Iraq.

Based on the discussion in section (3.4), this study proposes:

H3: KS will positively influence innovation in Iraq's public and private HEIs.

This leads to the following sub-hypotheses:

- ***H3a***: KS will positively influence product innovation in Iraq's public and private HEIs.

- ***H3b:*** KS will positively influence process innovation in Iraq's public and private HEIs.

Hypotheses H1 (a-h), H2 (a-d), and H3 (a-b) test the direct effects of TL on innovation and KS, and KS on innovation in public and private HEIs. The hypotheses are tested using

structural equation modelling (SEM) with the software AMOS 20. Firstly, it is determined whether the hypothesised model for both sectors has a good fit. Then, the focus turns to the path coefficients and their associated t-value (which should be 1.96) or greater in order to be considered significant at $p< 0.05$ and so support or reject the hypotheses. The study also takes into consideration the direction of the parameter values (i.e., +/-), where (+) means the effect is positive, while (–) refers to a negative effect (Byrne, 2010, Hu et al., 1995, Blunch, 2012). Based on the discussion in section (3.5), this study expects that:

H4: KS will positively mediate the impact of TL on innovation in Iraq's public and private HEIs.

This hypothesis examines the indirect effect of TL on innovation through KS processes in public and private HEIs and is again tested using SEM with AMOS 20.

Based on the discussion in section (3.6), this study suggests that:

H5: There is a significant difference in the TL practice exhibited by public and private HEIs in Iraq. This leads to the following sub-hypotheses:

- *H5a:* There is a significant difference in idealised influence practice between public and private HEIs in Iraq.

- *H5b:* There is a significant difference in inspirational motivation practice between public and private HEIs in Iraq.

- *H5c:* There is a significant difference in intellectual stimulation practice between public and private HEIs in Iraq.

- *H5d:* There is a significant difference in individualised consideration practice between public and private HEIs in Iraq.

Based on the discussion in sections (3.2 to 3.7), this study expects the following hypotheses to hold:

H6: There is a significant difference in the impacts of TL on innovation between public and private HEIs in Iraq.

H7: There is a significant difference in the impacts of TL on KS between public and private HEIs in Iraq.

H8: There is a significant difference in the impacts of KS on innovation between public and private HEIs in Iraq.

Multiple-group SEM testing is used to assess whether any of the hypothesised relationships in the baseline model differ significantly between the public and private universities. Structural invariance is conducted; the study first unconstrained the structural coefficients in both sectors for each relationship, and then adds equality constraints on the structure weights. If the differences in the χ^2 values and dfs between the unconstrained and constrained models are significant at p<0.05, it will indicate a difference between sectors regarding the hypothesised relations (Hair et al., 2010, Kline, 2005).

3.8 Summary

Several studies have linked TL, KS and innovation in isolation is presented in this chapter. A critical evaluation of these studies has clarified that there is a lack of empirical studies about the role of KS as a mediating variable between TL and innovation within academic environments in developing countries particularly Iraq. Moreover, there is no comprehensive researches that concentrate on the differences between public and private HEIs. Since many efforts are being made by the policy makers within the HE sector to reform and enhance the sector's performance and emphasise the importance of innovation in public and private

organisations, particularly in learning environments. KS initiatives and the presence of TL have the potential to help the HE sector to enhance its innovation and be more competitive. As a result, a specific model is developed for this study in this chapter, which consists of three constructs: TL (idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration), KS (donating and collecting), and innovation which includes product and process types. This model is aimed at examining the impact of TL on innovation through the mediating effect of KS in public and private HE in Iraq and the differences in their effects between the two sectors. The next chapter presents an overview of the system of HEIs in Iraq.

CHAPTER FOUR: AN OVERVIEW OF HEIs IN IRAQ

4.1 Introduction

This chapter presents some background about the system of HEIs in Iraq so as to provide the reader with an understanding of the current situation. It begins with a discussion of the general characteristics of HEIs. The chapter then presents, in detail, the development of HEIs and scientific research, and the current system of public and private HEIs. Then, it critically reviews the issue of international strategy adopted by the MOHESR to reform the higher education sector.

4.2 General characteristics of HEIs

Galang (2010) stated that higher education (HE) is the key to improving quality of life for individuals and for humankind collectively. It is the highest level of the educational ladder (Amin, 2006). Lozano (2006) explained that HEIs play an important role in transforming societies by educating decision-makers, leaders, entrepreneurs and academics. HEIs encompass universities, colleges, institutes, research centres and units (Yuan and Zuo, 2013). They are highly complex and include multidimensional elements, namely staff (teaching and non-teaching), students, human capital, faculty, buildings, laboratories, libraries and organisational routines and behaviours (van Weenen, 2000, Amin, 2006, Lozano et al., 2013). It is important to recognise that HEIs differ from business organisations in terms of their missions, priorities, characteristics such as size, budget, autonomy and the authority to make decisions, customers who have different needs, and in their focus (Volkwein and Parmley, 2000). Cortese (2003) noted that the systems that exist in HEIs include educational systems such as courses and curricula, research systems, campus operations and community. He

argued that these activities cannot be separated as they must work together in order for an institute to be successful.

Prior literature has reported mixed views regarding the characteristics of public and private HE. For instance, Balan (1990) noted that private HEIs have responded more quickly to market demands than public institutions. It is argued that the private sector can respond better to the needs of society and provides better paid jobs (Patrinos, 1990). Others, such as Wilkinson and Yussof (2005), found that public HEIs employ a lot more senior and better qualified staff than private HEIs and are more efficient in satisfying the public demand for a good quality of education. On the other hand, Mintzberg (1993) pointed out that public HEIs are bureaucratic institutions and incorporate complex political systems. Similarly, Perry and Rainey (1988) indicated that public institutions are less motivated by financial considerations.

4.3 The development of HEIs and scientific research in Iraq

HE in Iraq began in 1908 with the establishment of the Faculty of Law, followed by the establishment of different colleges and institutes such as colleges of Education in 1932, Medicine in 1933, Pharmacology in 1936, Engineering in 1943, Arts and Sciences in 1945, Girls in 1946, Administration and Economics in 1947, Agriculture in 1952, and Dentistry in 1956. In 1958, the University of Baghdad was founded and recognised as the body responsible for managing scientific and administrative affairs. In 1959 came the establishment of the Central Library, which started to acquire all sorts of human knowledge to serve educational and scientific research purposes. In 1967, the University of Mosul and the University of Basra were founded (MOHESR, 2012).

In 1970, the Ministry of Higher Education and Scientific Research (MOHESR) was founded. It was responsible for putting in place educational, cultural, scientific, and technical policy in the country, towards the creation of generations equipped with the science and knowledge to

be an effective and influential force in society. MOHESR also worked towards developing cultural and scientific relations and broadening cooperative ties in the aforementioned areas with various scientific institutions all over the world so as to achieve harmony and complementarity in the fields of science and knowledge. MOHESR's law number 132 in the year 1970 confirmed the autonomy of universities, as well as institutes, in terms of scientific, administrative, and financial matters. HEIs are supervised by the Council of Higher Education, which includes university presidents and representative of MOHESR. The Council of Higher Education proposes educational, cultural, scientific, and technological policies for the whole country and has the power of approval over many educational matters. The organisational structure of MOHESR comprises the following offices:

1. The Office of the Minister of Higher Education and Scientific Research

2. The Office of Deputies

3. The Office of the General Inspector

4. The Office of Supervision and Scientific Evaluation

5. The Administrative and Legal Office

6. The Office of Rebuilding and Projects

7. The Office of Research and Development

8. The Office of Studies, Planning and Follow-up

9. The Office of Scholarships and Cultural Relations

Each office is split into departments and sub-branches in order to carry out their main duties. The Centre of Ministry undertakes the following duties:

1- Draws up the scheme of admission for undergraduate and postgraduate students

2- Draws up the scientific, educational, cultural and technical schemes for universities and the Foundation for Technical Education (FTE)

3- Sets up scientific, professional and bilateral cooperation with other countries and organisations

4- Approves the opening of new colleges or institutions and makes recommendations regarding the opening of universities

5- Gives approval over curricula

6- Set out the principles for the assessment of degrees in Arabic and foreign academic degrees that follow secondary education

7- Grants educational leave, scholarships, and lending services for members of staff in addition to attending to the administrative and financial matters of HE

By the year 2011, MOHESR had 24 public universities, and 43 technical institutes and colleges spread across the country, as well as five research centres and 28 private colleges (MOHESR, 2012)

4.4 The system of Iraqi HEIs

4.4.1 Public HE

Public institutions in Iraq encompass universities and the institutes of the Foundation of Technical education (FTE), all of which are under the supervision of MOHESR except for five universities and two institutes of the FTE that work under the Ministry of Higher Education for the Kurdish region but are also coordinated with MOHESR in Baghdad. In general, there are two types of academic studies within public HE: morning studies and evening studies. In the morning studies, the students that have graduated from secondary schools are admitted and compete for places at the universities and technical colleges and institutions according to their average marks. This education is free for the students, including textbooks and tuition fees. The level of these students is higher and when they graduate, they have more opportunities to get jobs in both the public and the private sector.

Evening studies, on the other hand, admit the graduates of secondary schools but also those who graduated in previous years. The students are not subject to centralised admission and there is no limitation on their age. The admission mechanism and average marks of the students are left to each university and institute. Here, the students have to pay tuition fees and these vary according to the type of study and the university. They also have to pay for, books. The students follow the same curricula as in the morning studies and take the same final exam (MOHESR, 2012).

4.4.2 Universities

Universities are made up of colleges, institutes, and research centres. The Council of the University is the highest administrative and scientific body. It consists of a vice-chancellor (university president), deans, the deputies of the vice-chancellor and two members of teaching staff selected by the president and the members of the university to sit on the council for the next two years. The University Council also has the right to select two experts from outside of the university to join them on the council for the next two years.

The Council of the University is in charge of scientific matters such as recommending plans for acceptance in higher studies, endorsing the scientific research plan, endorsing the writing and translation plan, providing teaching requirements and `awarding degrees of` professorship to members of the teaching staff. It also proposes study methods and changes aimed at maintaining a strong scientific situation, and handle financial and administrative issues (MOHESR, 2012).

The College Council, the highest administrative and scientific body of the college is made up of the dean, the deputy dean, the heads of the scientific departments or branches, and the directors of any research centres linked to the college. The council has the right to select two experts from outside of the college to serve for two years. The Council is in charge of

scientific matters, such as the admissions policy for primary and higher studies for each department and scientific branch. Makes specific schemes regarding scientific research, composition and translation, provides the requirements of education, increases the members of the teaching community, approves the policies of scientific departments, approves the titles of university theses and the results of debates, and adds or deletes study materials for higher studies, in addition to resolving administrative, and financial matters (Sikhi, 2008).

The scientific department is the principal scientific unit in the university. The department council is run by the head of the scientific department, and his/her assistants, who are in charge of the department, and they debate methods of study, textbooks and proposed modifications according to the recommendations of members of the teaching staff, approve scientific research projects presented by the members of the departments, supervise the teaching of courses, and methods, follow up on the affairs of students in different phases of study through theoretical and practical supervision, propose the needs of the department regarding faculty staff and technicians, and recommend the sending of invitations to visiting professors (MOHESR, 2012). Table 5 shows the universities registered in the database of MOHESR and their years of establishment and locations[1].

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[1] This study excludes the universities in the Kurdish region

Table 5: Public universities

University	Number of colleges	Name of colleges	Year of establish	City
Baghdad	24	Dentistry, Sciences, Alkwarizmic for engineering, Engineering, Medicine, Pharmacy, Administration and Economics, Agriculture, Veterinary Medicine, Physical Education, Fine Arts, Nursing, Sciences for Girls, Education for pure science/ Ibn −Al-Hatham, Physical education for girls, Alkindy college for Medicine, Law, Ibn Rushd College of Education, Arts, Education for girls, Islamic Sciences, Political Sciences, Languages, Mass communications.	1958	Baghdad
Al-Mustansiriyah	12	Medicine, Dentistry, Pharmacy, Administration and Economics, Sciences, Law, Political Sciences, Engineering, Arts, Education, Basic Education, Physical Education	1963	Baghdad
Basrah	15	Sciences, Engineering, Medicine, Pharmacy, Administration and Economics, Agriculture, Veterinary Medicine, Dentistry, Nursing, Scientific Education, Law, Arts, Humanities Education, Physical Education, Education College for Girls, Al-Qurna of Education, Fine Arts	1967	Basrah
Mosul	24	Medicine/ Mosul, Medicine/ Nainawa, Dentistry, Pharmacy, Administration and Economics, Law, Physical Education, Fine Arts, Engineering, Arts, Agriculture, Veterinary Medicine, Nursing, Education, Islamic Sciences, Political Sciences, Sciences, Environmental Science, Electronics Engineering, Computer Sciences and Mathematics, Archaeology, Education for girls.	1967	Mosul
Technology	14department	Mechanics and Equipments Engineering, Electrical and Electronic, Building and construction, Electro-mechanical, Control and systems, Production and Metallurgy, Chemical, Architectural, Applied Sciences, Computer Sciences, Computer, Materials, Laser and Electronic optics, Petroleum	1975	Baghdad

Kufa	19	Veterinary Medicine, Nursing, Education, Sciences, Pharmacy, Administration and Economics, Law and political sciences, Physical Education, Basic Education, Engineering, Dentistry, Medicine, Arts, Computer Sciences and Mathematics, Education for Girls, Agriculture, Physical Planning, Jurisprudence, Archaeology and Heritage	1987	Najaf
Tikrit	19	Education for Girls, Medicine, Engineering, Education, Sciences, Administration and Economics, Law, Pharmacy, Arts, Islamic Sciences, Physical Education, Veterinary Medicine, Political Sciences, Basic Education, Computer Sciences and Mathematics, Dentistry, Oil and metals, Engineering/ Al-shrkat, Agriculture	1987	Salahaddin
Qadisiyah	12	Computer Sciences and Mathematics, Education, Administration and Economics, Physical Education, Veterinary Medicine, Sciences, Engineering, Medicine, Agriculture, Arts, Law, Education for Girls.	1987	Al-qadisiyah
Anbar	21	Medicine, Dentistry, Pharmacy, Veterinary Medicine, Engineering, Sciences, Arts, Computers, Agriculture, Physical Education, Education for Pure Sciences, Education for Humanities, Law and Political Sciences/Ramadi, Law/ Falujah, Islamic Sciences/Ramadi, Islamic Sciences/Falujah, Education for Girls, Education/Qaim, Basic Education/Haditha, Administration and Economics/Ramadi, Administration and Economics/ Falujah	1987	Anbar
Al-Iraqia	8	Arts, Education for Girls, Law, Administration and Economics, Education, Medicine, Engineering, Shari 'a, Media, Religion's Pillars	1989	Baghdad
Babylon	18	Medicine, Dentistry, Pharmacy, Engineering, Sciences, Sciences for Girls, Law, Arts, Physical Education, Fine Arts, Basic Education, Administration and Economics, Nursing, Computer Technology, Material Engineering, Education for Human Sciences, Education for Pure Sciences, Holly Quraan Studies.	1991	Babylon
Nahrain	7	Medicine, Engineering, Sciences, Information Sciences, Law, Administration and Economics, Political Sciences	1993	Baghdad
Diyala	12	Medicine, Engineering, Education for Humanities Sciences, Sciences, Agriculture, Physical Education, Veterinary Medicine, Islamic Sciences,	1998	Diyala

		Administration and Economics, Basic Education, Fine Arts, Education/ Al- Razi		
Kerbala	16	Medicine, Dentistry, Veterinary Medicine, Engineering, Sciences, Administration and Economics, Physical Education, Nursing, Education for Humanities Sciences, Education for Pure Sciences, Law, Islamic Sciences, Pharmacy, Agriculture, Applied Sciences, Religious Tourism	2002	Krebala
Thi-Qar	11	Education, Arts, Sciences, Engineering, Medicine, Law, Agriculture, Physical Education, Administration and Economics, Computer Sciences and Mathematics, Nursing	2002	Thi-Qar
Kirkuk	8	Law, Education, Nursing, Engineering, Sciences, Medicine, Administration and Economics, Education for Pure Sciences, Agriculture	2003	Kirkuk
Wasit	15	Medicine, Engineering, Sciences, Law, Administration and Economics, Dentistry , Education, Arts, Basic Education, Agriculture, Physical Education, Fine Arts, Computer Sciences and Mathematics, Veterinary Medicine, Media	2003	Wasit
Misan	12	Medicine, Dentistry, Pharmacy, Engineering, Nursing, Sciences, Agriculture, Physical Education, Law, Education, Islamic Education, Administration and Economics	2007	Misan
Al-muthanna	12	Physical Education, Basic Education, Education, Sciences, Engineering, Agriculture, Medicine, Administration and Economics, Dentistry, Veterinary Medicine, Law, Nursing	2007	Al-muthanna

In addition, there are seven centres for research: the Iraqi Foundation for Computers and Information, the Iraqi Foundation for Medical specialisations, the Institute of Urban and Regional, the Institute of the Study of Accountancy and Finance, the Laser Institute, and the Embryo Research Institute.

The study system followed in Iraqi universities differs according to whether they are day or evening studies between annual systems of 30 weeks and semesters of 15 weeks. The policy adopted by MOHESR is to admit all students that finish secondary school (scientific or artistic) to colleges or institutes, at which the percentage of applications admitted is 100% for vocational studies (industrial, agricultural, and commercial). The state is not obliged to admit more than 10%. Public universities aim to produce graduates in different areas of specialisation and offer B.Sc qualifications after a four to-six year study. Period, with five years in the College of Veterinary Medicine, the College of Dentistry, the College of Pharmacy, the College of Architecture, the College of Human Medicine, and in biomedical at the Al-Khawarizmi Engineering College. The period of study is six years for colleges of medicine only. For all other colleges, the period of study is four years.

 M.Sc degrees require two to three further years of study after the Bachelor's degree, and the highest degree is the Doctor of Philosophy, which requires three to five years of study beyond the Master's degree.

4.4.3 Technical education

Iraqi's HE has a relatively strong orientation towards technical education in general and applied technical studies in particular. The boom in the oil sector created a demand for qualified workers and technicians, and this stimulated the government to establish technical institutes with an initial funding of US$700 million in 1969 (UNESCO, 2004). The (FTE) was founded in 1969 and is made up of colleges and institutes that specialise in technological education The Council's colleges and institutes have their own character, as well as financial

and administrative independence. The Board has the power to establish, closedown or merge technical colleges and institutes. It is led by a council headed by the foundation's chairman and a number of deans from technical colleges and institutes. This council has responsibilities and powers identical to those of university councils. Currently, the FTE includes 15 colleges and 30 technical institutes spread across several Iraqi cities from the north to the south of the country. Technical education aims to prepare students up to the diploma level and to create links between specialists and skilled workers in the fields of engineering, administration, health, medicine, agriculture, and applied arts. It seeks to determine the needs of various sectors regarding technical education graduates, to prepare the relevant programmes and adapt them to the environmental variables, to support investment in scientific research, sponsor creators to achieve distinction in the creation of knowledge, and to offer high-quality services (FTE, 2011).

Technical colleges have 38 specialisations divided into 20 engineering, 7 health and medicine, 4 agriculture, and 5 administration and applied arts specialisations. The colleges offer the graduate Bachelor's certificate, with a four-year period of study, while there are 20 postgraduate programmes, two offering the Ph.D with a period of study of three to five years. 12 offering the MSc qualification with a period of study of two to three years and four offering higher diplomas that take one to two years to complete. Technical institutions, on the other hand, have 64 specialisations divided among 26 engineering, 14 health and medicine, 12 administration, 8 agriculture and 4 applied arts specialisations. The institutions offer the graduate technical diploma with a two-year study period (UNESCO, 2004, FTE, 2011)

The foundation also has eight research units, 36 consultancy and scientific service bureaus offering technical training expertise to all communities, and 8 units for research in different specialisations, along with a staff development centre aimed at increasing the expertise of the teaching staff and the technical and administrative employees. The curricula offered by the

foundation comprise a practical and applied aspect that forms 60-70% of the course, such as workshops and laboratories at the institutes, as well as practical placements in enterprises, offices, or medical institutions, and a theoretical part that forms 30-40%. Table 6 lists the technical colleges and institutions registered in MOHESR's database and their years of establishment and locations (FTE, 2011).

Table 6: Technical colleges and institutes

College/ institute	Number of departments	Year established	City
Technical college/Baghdad	8	1993	Baghdad
Technical college of Mosul	5	1993	Mosul
Technical college – Basrah	5	1994	Basrah
Health and Medical Technical college	7	1995	Baghdad
Technical college/ Musab	7	1998	Babylon
Technical college/Najaf	4	1998	Najaf
Technical college/Kirkuk	6	1999	Kirkuk
Electrical and Electronic Technical college	3	1999	Baghdad
Technical college for administration/ Baghdad	4	2000	Baghdad
Technical college for administration/Kufa	2	2007	Najaf
Technical college for administration/ Mosul	2	2007	Mosul
Applied Arts college	2	2007	Baghdad
Technical college for administration /Basrah	2	2007	Basrah
Institute of technology/ Baghdad	8	1969	Baghdad
Technical institute foradministration/Ressafa	7	1969	Baghdad
Applied Arts institute	5	1969	Baghdad
Technical institute/Basrah	19	1973	Basrah
Technical institute/ Babylon	9	1976	Babylon
Technical institute/Mosul	21	1976	Mosul
Technical institute/Kirkuk	23	1976	Kirkuk
Technical institute for administration	5	1976	Baghdad
Technical institute/Anbar	10	1976	Anbar
Technical institute/Najaf	11	1978	Najaf
Technical institute/Aumara	10	1979	Mysan
Technical institute/Musayab	10	1979	Babylon
Technical institute/Shatra	10	1979	Thi-qar
Technical institute/Nasiria	9	1980	Thi-qar
Technical institute/Kut	9	1980	Wasit
Technical institute/Hawija	6	1980	Kirkuk
Technical institute/Kufa	10	1981	Najaf

Technical instructors training institute	4	1987	Baghdad
Technical institute/Alsuwayra	4	1987	Wasit
Technical institute/Door	5	1988	Tikrit
Technical institute/Baquba	9	1988	Dyla
Technical institute/Karbala	6	1988	Karbala
Technical institute/Semawa	6	1988	Muthanna
Institute of Medical technology/ Mansour	6	1988	Baghdad
Technical institute/Dewanya	5	1988	Qadisaya
Technical institute/Nainaw	5	1993	Mosul

The latest statistics show that the number of students enrolled in public education was (325,994) for 2006/2007, and (400,866) for 2010/2011, a percentage increase of (23.96%) (CBS, 2011b, MOHESR, 2012, CBS, 2007) (see Table 7).

Table 7: Number of undergraduates enrolled in public education

Institute	2006-2007		2010-2011	
	Day studies	Evening studies	Day studies	Evening studies
Universities	203,970	64,800	244,010	79,570
FTE	52,117	5,107	70,713	6,573
Total	256,087	69,907	314,723	86,143
Total/all	325,994		400,866	

Regarding postgraduates, the latest statistics show that the number of students enrolled in 2006-2007 was (15,530) while the number enrolled in 2010-2011 was (21,136) a percentage change (of 36%) (see Table 8) (CBS, 2007-2011).

Table 8: Number of postgraduates enrolled in public education

Institute	2006-2007	2010-2011
Universities	15,252	20,843
FTE	278	293
Total	15,530	21,136

4.4.4 Scientific research

Theoretical and applied scientific research is pivotal to the development of nations. As it is a core foundation of the development of HE, it must assume a lead role in scientific advancement and cultural enhancement.

Iraqi HEIs follow the British tradition of scientific research. In some colleges, the research activities take place in laboratories; these include the disciplines of science, education, engineering, and medicine (UNESCO, 2004, MOHESR, 2012). The research topics pursued by university researchers are oriented towards finding practical solutions to the problems that beset society. In medicine, the research activities are community-oriented, whereas in physics, chemistry, biology and technology they are industry-oriented. Table 9 lists the centres and units of research within public HEIs:

Table 9: Research centres in public HEIs

University/ Institute	Research centre
Baghdad	1.Center for market research and protect of consumer 2.Centre of Psychological research (Para Psychology) 3.Centre of Education and Psychology 4.Research centre and museum of natural history 5.Revival centre for Arab scientific heritage 6.Centre of International studies 7.Center of Palestinian studies 8.Centre of Baghdad Documents 9.Unit of joint diseases between human and animal 10.Research Cell for the diseases of hot regions

	11. Unit of remote sensing 12. Unit of Biological Control 13. Unit of Palm tree research 14. Unit for research of woman
Mousel	15. Centre of regional studies. 16. Centre of remote sensing. 17. Centre of Dams and Water resource. 18. Centre of Mousel Studies 19. Centre of rainfall cultivation. 20. Centre of Environment and Contamination control. 21. Centre of Economic research.
Basrah	22. Centre of Arab Gulf Studies 23. Centre of Marine Science 24. Centre of Iranian Studies 25. Centre of Polymers research. 26. Centre of Palm trees and Palms Research. 27. Centre of Basrah Studies 28. Hemoglobin disorder Unit. 29. Water desalination Unit
Mustansiriyah	30. Centre for Arab world Studies 31. Iraqi Centre for Cancer Research and Medical genetic 32. National Diseases Centre 33. Centre for Research of Blood Diseases 34. Unit of Linguistic Research 35. Unit of Polymers research
University of Technology	36. Centre of Environment Research 37. Centre of Energy and Fuels Research 38. Unit of workshop and training 39. Unit of Energy Materials researches 40. Unit design and Industrial Production 41. Unit of for Future Plant Research 42. Unit of design and Forms Production
Al-Nahrain	43. Centre of Medical Research 44. Centre for Research of Biological Techniques 45. Centre for Law and Political Studies
Al -Anbar	46. Unit of Desert Studies
Karbala	47. Unit of Al-Razaza Lake and west Euphrates Studies 48. Unit of Law Studies
Deyala	49. Centre of Childhood Research
Al-Qadisiya	50. Unit of for Environment Research 51. Unit of for Research of joint Diseases
Krikuk	52. Unit of for Environment Research
Kufah	53. Centre for Kufah Studies

	54.The Middle Euphrates Unit for Cancer Research
Thi-Qar:	55.Centre for Lakes and Marsh Studies
Babylon	56.Centre for Local Environment Research 57.Centre for Babylon Studies 58.Centre for Instruments and Studies of Low Copper Vessel 59.Unit of Research of Medical Psychology
Iraqi	60.Centre for Islamic Research and Studies
FTE	61.Unit of Cotton 62.Unit of Corn Research 63.Unit of Medical Alternatives and requirements 64.Unit of Quality Research

4.4.5 Iraqi Foundation for Computers and Information Science

The system in this Foundation is similar to the university standard and its council has the same specialisations and powers entrusted to university councils, enjoying moral responsibility and financial and administrative autonomy. The foundation encompasses the Institute of Information for Higher Studies, which includes theoretical and applied studies in the field of higher studies at the level of Diploma, Master's, and Ph.D. In addition, the Centre of Scientific and Technology Information is responsible for setting up the National Network for Scientific and Technology Information, ensuring the participation of different national organisations, working towards joining it with world networks, and participating in spreading academic knowledge to different parts of the world. Furthermore, it includes the Centre for Information Technology, which deals with research, development, and forwarding suggestions from the field of computers, communication networks and the programming industry, proposing nationally relevant projects and implementing them individually or with the cooperation of research and industrial centres and organisations in Iraq. The foundation undertakes the following tasks:

- Proposes policies and plans and makes suggestions in the field of information science and systems, and computer programming.

- Participates in setting the standards and methods of evaluation for information activities

- Conducts research and theoretical and practical studies in the field of information science.

- Participates in setting and developing methods for engineering, computer science and programming departments of universities

- Arranges training sessions in the field of information science and prepares of the foundation.

4.4.6 Iraqi Foundation for Medical Specialisations

The council for this foundation is an educational institution and is similar to the university standard. The foundation has financial and administrative autonomy. It head has a similar role to that of the university president and its council is at the university council level. The council grants its graduates a degree (fellow) that is considered a professional degree in their specialisation and is equivalent to the PhD.

4.4.7 Private HE

Private HE uses the talents, resources and scientific capabilities in society to the benefit of the process of scientific structuring, contributing to development through the creation of specialties that complement those existing in public universities. It has established a diverse scientific foundation to meet the needs of society. In addition, it contributes towards reducing the unemployment rate by hiring staff, employees and workers for its institutions. The roots of private HE in Iraq date back to 1963 when the University College was established following an initiative by the Teachers' Syndicate. In 1968, the name of the University College was changed to Al-Mustansiriyah University. In 1974, the issuance of decree number 102, on the reorganisation of the universities in Iraq, turned Al-Mustansiriyah University into a public university (Sikhi, 2008).

Private HE in Iraq did not receive sufficient attention until 1988 when a number of universities were established, such as the Al-Mansur University College, Al-Turath University and Al-Rafidayn University. In 1996, decree number 13 issued by the MOHESR outlined the mechanism for work in universities and in private colleges, and in 2011 the number of private colleges reached 28 (see Table 10). This sector is supervised directly by MOHESR but its budget is independent (MOHESR, 2012).

College acceptance requirements require applicants to have completed their high school studies, in the scientific and the artistic branches, as well as the technical schools. Applicants must be no more than 30 years of and compete with each other for admission to the various scientific departments according to their average grades. Medical specialties require high average grades (85), while engineering requires (75). The average grades required are lower for the humanities.

The curricula in the scientific departments uses the same textbooks and follows the same system as the public universities, as approved by MOHESR. The duration of study ranges between four and six years, depending on whether the studies, are morning or evening. Only Bachelor's degrees are offered and the university tuition fees differ according to whether the studies are morning or evening, the college and the scientific department.

Table 10: Private colleges enrolled in database of the MOHESR

College	Number of departments	Year of establishment	City
Al-Turath university	6	1988	Baghdad
A-Monsour university	9	1988	Baghdad
Al-Rafeden university	10	1988	Baghdad
Al-Mamon university	4	1990	Baghdad
Shat al-rab university	5	1993	Basrah
Al-maaref university	5	1994	Anbar
Al-hadbaa university	7	1994	Mosul
Al-yarmouk university	7	1996	Diyala
College of Baghdad for Administrative and Economic sciences	5	1996	Baghdad

Baghdad college for Pharmacy	3	2000	Baghdad
Ahl al-bait university	7	2004	Karabla
College of Islamic university	7	2004	Najaf
Dijlah university college	9	2004	Baghdad
College of Peace university	5	2005	Baghdad
College of Meadenat elelm university	5	2005	Baghdad
College of Humanitarian studies	6	2005	Najaf
College of Shayk al-Tusi University	3	2006	Najaf
Imam Jafar Sadiq University	6	2009	Baghdad
College of Al- Rasheed University	5	2010	Baghdad
College of Iraq	3	2010	Basrah
College of sadr Iraq university	7	2010	Baghdad
College of Hussain for Engineering	3	2010	Karabla
College of Al-qlem	7	2010	Krikuk
College of wisdom	3	2010	Baghdad
College of Future	6	2010	Babylon
College of Al- Imam	3	2010	Tikrit
College of Al- Hilla	3	2011	Babylon
College of Tenets of the religion	2	2011	Baghdad

The latest statistics show that the number of students enrolled in 2010-2011 was 75,511, compared to 27,179 in 2006-2007, a percentage change of (55%) (CBS, 2007-2011).

4.4.8 Teaching staff

Kim and Ju (2008) stated that the main tasks for faculty members are teaching students, carrying out research, consulting, providing and designing courses, and conducting research projects. The teaching staff in universities, institutes and technical colleges (Iraqi public and private) include assistant lecturers, lecturers, assistant professors, and professors. The title of Assistant Lecturer is given to those who have a Master's or an equivalent degree. The title of Lecturer is given to those who either (1) have a recognised PhD degree or equivalent or (2) have been an assistant lecturer in any university or FTE institution for a period of not less than three years and have published during this period at least two valuable pieces of research and performed well. To qualify for an Assistant Professor post, one should meet worked as a teacher for at least four years, and published at least three valuable pieces of scientific research. The title of Professor is given to those who spent at least six years as an assistant

professor, performed well in their teaching, and published at least three pieces of original research.

The latest statistics for the number of teaching staff, as shown in Table 11, were 34,618 in public universities and 1,117 in private colleges in 2010-2011 with a percentage change since 2006 of 21.24% for the public institutes and 86.47% for the private colleges (CBS, 2007-2011, MOHESR, 2011).

Table 11: Number of teaching staff in public and private Iraqi HEIs

Sector	2006-2007	2010-2011	The rate of change during the period
Public universities (day and evening studies	28,510	34,618	21.42%
Private colleges (day and evening studies)	599	1117	86.47%

4.5 International strategy for the reform of HEIs in Iraq

A few years ago, MOHESR launched a strategy to reform the HE sector. It adopted a number of approaches and set goals for upgrading HE. It identified 115 projects aimed at reforming and developing the HE sector at a cost of US$26 billion. The work on these projects was started in 2009 and has benefited from the assistance of international organisations such as UNESCO, UNICEF, and the World Bank. The strategy includes an effective work plan to be implemented between 2012-2020 according to a timetable outlining the actions, activities, parties responsible for the execution of each activity, and the deadline for completion alongside indicators and the expected results. The current strategy comprises the following main axes:

1) Study programmes:

- Regularly updating study programmes every four to six years, to keep up with global developments, allowing annual updating at an average of 10-20%.

- Creating specialised research centres and providing these centres with a scientific cadre. In this realm, the Ibn Sina Electronic Centre has been founded. Here, training, and development courses and workshops are held for teaching staff from Baghdad, Basra and Salah al-Din, in cooperation with UNESCO.

- Specifying particular standards for graduates (matching international high-quality criteria)

- Updating methods of teaching according to the principles adopted by reputable universities.

- Creating scientific associations

- Adopting national criteria to ensure excellence in HE according to the criteria of excellence adopted universally, so as to improve the output quality in line with the needs for the advancement of society

- Introducing a unified plan for the holding of conferences, seminars and workshops, with the eventual aim of holding international and specialised conferences

2) Innovation and scientific research

Innovation in the HE sector is considered the main engine of economic and social development (Brodhag, 2013). It is noted that within HEIs innovation could be achieved through the presentation of academic results such as research projects, new courses, new training, curricula (Chen and Chen, 2008), teachers' professional development, resource applications, campus redesign, and teaching materials. MOHESR is to stimulate innovation

within HEIs through the allocation of funds to support the components of innovation, and follow-ups with educational institutions. The following work is planned:

- Providing the funding needed for scientific research through increased allocations, and establishing a council for the printing, publishing and distribution of books and other publications.

- Building competent research teams through:

    - Research groups in various specialties.

    - Full support for strengthening research work and studies.

- Creating an effective, organised and technical partnership between educational institutions and other sectors by signing agreements and Memoranda of Understanding (MOUs) with other ministries

- Maximizing the use of resources and capabilities for scientific research purposes by providing the requirements for conducting scientific research and contracting research professors at universities and other institutions

- The Ministry has established a department "Support for Scientists and Innovators", which is responsible for the following:

    - Taking care of creative work and scientists by granting outstanding staff members annual awards, such as the Top Ministry Professor, the Top University Professor, the Top College Professor, awards to the holders of innovation patents, and to those with three research papers published in specialised international journals.

    - Rewarding those with exceptional achievements and scientific inventions

    - Granting the Scientific Excellence and Invention Award for the best research project

    - Allocating funds for scientific research

- Regarding learning, MOHESR is supporting research scholarships by sending postgraduate students (PhD and Master's), in all specialties, along with their supervisors, to various countries around the world for a period of six months, to complete their research outside Iraq and find out about new scientific sources in the fields of research and technology. MOHESR covers all expenses related to travel, tuition fees, health insurance, accommodation and the cost of living for the students and the supervisors.

- Designing programmes and strengthening scholarships and students' study grants, and activating joint HE programmes with reputable universities

- Developing the teaching cadres outside Iraq by providing training opportunities, and facilitating the funding and administrative procedures for travel

Since 2008, there have been 1,600 scholarships awarded to those in HE, to those from, other ministries and to unemployed university graduates to allow them to travel to the USA, the UK, Australia, Canada, Japan, Romania, Russia, Italy, Germany, Sweden, China, France, Poland, the Netherlands, Malaysia, Turkey and India. These people were granted scholarships on the condition that they must return home and work in HE establishments following graduation. The specialties covered include engineering, medicine, agriculture, pure sciences and other sciences. As of 2012 10,000 scholarships has been endorsed over a period of five years.

As for scholarships granted by foreign countries, there was cooperation with more than 14 countries, leading to the approval of 33 strategic scholarships, 140 research scholarships and 70 training scholarships. Some of these are already in motion; others will be soon. In addition, 12 Memorandum of Understandings (MOUs) have been signed with reputable international universities to facilitate the exchange of knowledge and to ensure that the offices of cultural attaches follow up on privately funded students studying outside Iraq.

3) Educational leadership and administration:

- Adopting scientific approaches in administration and broadening the scope of the delegation of power

- Developing academics on all levels

- Selecting university managers according to a set of criteria covering competence, professionalism and modern administration, based on competitiveness. (Selection is done every three years)

- Measuring managers'(leaders of institutes, i.e. chancellors, deans) performance is done through the following:

  - Universities are given a 'good performance' rating for publishing a large number of research papers and for holding conferences

  - The university or body that has signed the largest number of scientific agreements

  - The university or body with the highest profits generated from contracts in their field of specialty.

  - Universities or bodies that adopt programmes of quality improvement and guaranteed excellence

  - Using new technologies and programmes in their administrative work by increasing their reliance on electronic mail

4) Provision of suitable materials and environment:

- Developing university libraries and encouraging the use of the Central Library.

- Establishing an electronic library

- Using ICT and the Internet in teaching programmes

- Providing laboratory equipment, kits and other requirements

- Encouraging the move towards creating an academic, psychological and social environment supportive of innovation, invention and knowledge exchange within universities and departments

- Providing the infrastructure and other requirements necessary to enable members of the teaching staff and students to use technology, such as video conferencing

- Completing work on the infrastructure of new educational institutions and laboratories, upgrading and equipping them by making use of additional government support.

5) Central acceptance:

MOHESR is reviewing the mechanism and development of the central acceptance of students, and is increasing the number of specialties covered.

6) Laws and legislation:

- Amending the regulations and directives related to the principles of academic promotion and sabbaticals for university teaching staff.

- Amending the regulations pertaining to scholarships and cultural relations

- Amending the laws and regulations to allow greater participation by the private sector in the public sector's councils

- Amending the amended private universities and colleges law number 13 of 1996 so as to suit the current conditions of the society

7) Funding:

- Finalising the infrastructure and requirements of new universities, eight universities were established between 2009 and 2014.

- Allowances for academic titles are distributed as follows: 15% of the official salary for assistant lecturers, 25% of the official salary for lecturers, 35% of the official salary for assistant professors and 50% of the official salary for professors in accordance with the amended university service law number 23 of 2008.

- Giving a generous cash award to any staff members who publish a research paper in an international journal

With regard to scientific research, the cost of investments in pioneer projects to date has reached some 202 billion Iraqi dinars, with an allocation of 32 billion for 2012. This includes 14 pioneer projects aimed at upgrading the capabilities of teaching staff and researchers. Also, 513 staff members and researchers were sent to various countries. 300 PhD students studying in Iraq were sent abroad to bolster their research at the best foreign universities. Another project was the virtual library, which benefited some 75,000 users in 2012. An electronic search engine for refereed scientific Iraqi journals was also introduced. This project was launched in June 2012, enabling access to 200 refereed Iraqi journals containing over 51,000 research papers. Finally, the number of research centres and units reached 85 in 2012 while more than 100 scientific societies were established in various fields.

Regarding private colleges, MOHESR has established a department to deal specifically with them. Its main functions are as follows: the establishment of private universities and colleges, providing the necessary requirements, such as licensing newly founded colleges, verifying the acceptance of students in parallel departments in private colleges, endorsing the minutes of private universities' and colleges' meetings, and ensuring scientific and educational supervision. It is also working to strengthen the contributions of private universities and colleges to ensure that their requirements are in line with the Ministry's policies and directives, as well as the needs of the job market. Private universities and colleges must seek

complementarity, not similarity, in relation to specialties in science and the humanities at public universities.

This strategy will only succeed with the active participation of leaders and academic staff from the various institutions of Iraqi HEIs.

4.6 Summary

This chapter has presented important information regarding Iraqi public and private HEIs' goals and objectives. It has supplied details of the system used in the universities, colleges, scientific research centres and by the FTE. The chapter has reviewed MOHESR's international strategy and the initiatives it has adopted to reform the HEIs.

It has been noted that the core work of the universities is research and teaching activities. The HE sector is recognised as the engine for economic growth and the driver of innovation. The next chapter presents the methodology used in this study to achieve the objectives.

CHAPTER FIVE: METHODOLOGY AND RESEARCH DESIGN

5.1. Introduction

This chapter describes the methodology used to collect data so as to answer the questions of the study. It presents the research paradigm, research approach, and methods. It gives details about the mixed method used in this study and the reasons for selecting it. Specifically, it describes the questionnaire surveys used and the issues concerning sampling procedures. Structural equation modelling (SEM), which was used for the data analysis in the quantitative stage, is discussed. Finally, the qualitative stage of the data collection and analysis is described.

5.2. Research philosophy

According to Saunders et al. (2012), a philosophy means the use of argument and reason in seeking truth and knowledge, and is a framework that guides us regarding how scientific research should be conducted. Smith et al. (2008) noted that the study of philosophical issues has several advantages: it can help the researchers to clarify research designs; it guides researchers in identifying and creating designs that may be outside their previous experience and; it helps them to recognise which designs will work and which will not.

Researchers distinguish between two philosophical assumptions in designing research: positivism and interpretivism. The advocates of positivism believe that reality is independent of the research, and the goal is the discovery of theories based on empirical research such as observation and experiment (Saunders et al., 2012). In contrast, interpretivism philosophy assume that access to reality can only be achieved through social construction (Creswell, 2009, Berg, 2009). The theoretical differences between these two philosophies are as follows, according as follows, according to Collis and Hussey (2009):

1) The ontological assumption refers to the nature of reality. The positivism philosophy is objective, singular, and independent of the researcher. In contrast, the interpretivism philosophy believes reality to be subjective and multiple.

2) Epistemological assumptions, positivism assumes that the researcher is independent of the topic being researched, while according to interpretivism the researcher interacts with what is being researched, so that the epistemology refers to the validity of the knowledge.

3) Axiological assumptions, refer to the role of values. The positivism philosophy believes that research is value-free and unbiased. In contrast, interpretivism assumes that the researcher acknowledges the value of the research and the fact that biases are present.

4) Rhetorical assumption, refer to the language of the research. Positivism tends towards the quantitative approach that defines causal relationships in the questions or hypotheses of the research, is written in a formal style, and uses the passive voice. Interpretivism depends on the qualitative approach, is written in an informal style, and uses the personal voice.

5) Methodological assumptions, are concerned with the process of the research. The main processes of positivism are the deductive process, cause, and effect, static design, generalisation leading to prediction, explanation, and understanding results. Findings are tested for accuracy (validity) and reliability. Furthermore, studies following this approach use large samples. In interpretivism studies, on the other hand, the main process is inductive, factors are shaped along with the emerging design, the context is bound, patterns and theories are developed to provide understanding, and reliability is achieved through verification. The researcher

depends on a small sample and uses a number of methods to obtain different perceptions of the phenomena.

Although the positivism paradigm can provide wide coverage, and makes it easier for researchers to give justifications of policies, it is inflexible and artificial, unsuitable for process generation, and does not provide obvious implications for action (Smith et al., 2008). On the other hand, analysis and interpretations are difficult within the interpretivism paradigm and may not have credibility with policy makers, in spite of its advantages such as flexibility and ease of theory generation (Bryman, 2008). Thus, to overcome the weaknesses of the two paradigms, this study uses a mixed paradigm with positivism as the dominant paradigm in the first stage and interpretivism in the second.

5.3. Research approach

There are two main approaches that can be taken to research: deduction and induction. Deductive research tends to explain the causal relationships between variables by using quantitative data. In the first phase of the research, the researcher posits a set of principles or ideas that are then tested through empirical observation or experimentation (Berg, 2012). The concepts of this approach need to be operationalised in order for the facts to be measured quantitatively, and large samples are used so that the results can be generalised statistically. In this sense, the approach involves testing theory, hence it falls under the positivism paradigm (Bryman, 2008).

On the other hand, the inductive approach allows the research findings to emerge from significant themes inherent in qualitative raw data and uses several methods to collect these data. Researchers deal with a small sample of subjects and theory is developed as a result of the data analysis. Hence, this approach is exploratory, unlike the explanatory nature of deductive research. It works well under the interpretivist paradigm (Creswell, 2009).

The decision over whether to use the deductive or the inductive approach is not an easy one, but it is important to attach these approaches to the philosophies of the research as this will help the researcher to determine the types of strategies and methods to be used in the data collection (Saunders et al., 2009). Since this study uses multiple-paradigms, mixed approaches were used; deductive in the first stage to test the hypothesised model, and inductive in the second stage to explain the differences in TL practices and their effects on KS and innovation, and the effects of KS on innovation across sectors.

5.4 Methods used in the research

Creswell and Clark (2011) asserted that there are three methods that can be used by researchers in conducting their research: quantitative, qualitative, and mixed methods.

Quantitative research seeks to test theories by examining the causal relationships among variables (Bryman, 2012, Saunders et al., 2012). The main characteristics of this approach are as follows: the deductive approach that is attached to the positivism paradigm, it is confirmative, it uses theory/hypothesis testing, it is explorative, and predictive, and it uses data collection techniques such as questionnaires and statistical analysis (Creswell and Clark, 2011, Smith et al., 2008).

Johnson and Onwuegbuzie (2004) argued that quantitative research has several advantages over qualitative research: First, it explains how and why phenomena occur through the testing and validating of constructed theories. Second, researchers can test hypotheses before the data are collected and they can generalise the research results if they use random samples of the population, Third, it takes the researcher less time to conduct the analysis because of the use of statistical software.

However, the quantitative method has also been criticised, particularly by qualitative researchers who argue that this approach involves designs that disengage the researcher from the people and field they are researching. In addition, the statistical correlations between

variables may be arbitrarily defined by the researchers themselves (Gray, 2009, Berg, 2009, Bernard and Ryan, 2010). As a result of these weaknesses, researchers developed the qualitative method. Bryman (2012) described qualitative research as an approach to social research in which quantitative data are not collected or generated. This approach seeks to answer the questions of the research by examining different social settings, and the individuals who inhabit these settings (Berg, 2012). Qualitative techniques force researchers to share in the understandings and perceptions of others, besides discovering how people structure and give meaning to their daily lives (Saunders et al., 2009).

Bryman (2008) summarised the major characteristics of this approach as follows: The researcher collects data on participants' experiences. The researcher gathers the information by talking to them face to face and watching how they behave. The main instrument for data collection is the researcher, who examines documents, observes behaviour and interviews participants. The approach uses inductive data analysis in which categories are arranged from the bottom up. The researcher keeps a focus on learning the ideas and meanings that the participants hold about the problem at hand. The aim is to develop a complex picture of the research problem by including multiple perspectives and trying to identify the many factors involved in a situation (Gray, 2009).

Qualitative research has some distinct strengths as mentioned by Johnson and Onwuegbuzie (2004), such as the following: the participants' own categories of meaning are the main sources of data; the approach allows the researcher to study a small number of cases in depth; it can help the researcher to study complex phenomena; it can provide more detailed descriptions of people's personal experiences of phenomena. However, the approach also has some weaknesses, such as difficulties in applying it (i.e. problems of access and interpretation) and problems with data analysis (Creswell, 2007, Collis and Hussey, 2009, Berg, 2012). There are also problems with generalisation. For instance, when data are

collected from individuals in organisations it is difficult to know how findings can be generated (Bryman, 2008). However, this approach is important because it takes the researchers into a specific context so that they can gain a deeper perspective of the research.

Johnson and Onwuegbuzie (2004) argued that both quantitative and qualitative methods are concerned with answering the questions of the research, although more specific research questions tend to be asked in quantitative research and more in-depth questions in qualitative research. Furthermore, both quantitative and qualitative researchers seek to be clear about their research procedures and how their results were arrived at. Finally, the use of mixed methods can confirm the findings of the research and minimise the weaknesses of the two approaches (Creswell and Clark, 2011).

Johnson et al. (2007) suggested that there are three concepts for mixed methods: Firstly, mixed methods can be used at the data collection stage. Secondly, they can be used at both the data collection and the data analysis stage. Thirdly, mixing methods can occur at all of the stages of the research process. In a general sense, mixed methods is a type of research in which a researcher combines methods, philosophies, elements of both qualitative and quantitative approaches, and data collection and analysis (Creswell and Clark, 2011, Plowright, 2011, Creswell, 2009).

Mixed methods is a logic of inquiry that includes the use of induction (the discovery of patterns), deduction (i.e. the testing of theories and hypotheses) and abduction (uncovering and relying on the best of a set of explanations for understanding one's results). Because of its logical and intuitive appeal, this approach provides a bridge between the quantitative and qualitative paradigms (Johnson et al., 2007).

This study uses the mixed methods approach. There are many advantages to using this approach. It can be used for different purposes in a study, giving stronger evidence for

conclusions through convergence and the corroboration of findings (Saunders et al., 2012). It can help the researcher to answer research questions that cannot be answered by quantitative or qualitative approaches alone (Creswell and Clark, 2011). It is argued that the mixed methods approach can increase the generalisability of the results. It allows researchers to be more flexible, integrative, and holistic in their investigative techniques (Harrison and Reilly, 2011). Moreover, this approach is useful when either the quantitative or the qualitative approach alone would be inadequate for gaining an understanding of the research problem. Therefore, combining both approaches can give the best understanding, and minimise the weaknesses of both approaches (Creswell, 2009, Plowright, 2011).

Creswell and Clark (2011) suggested that there are six types of mixed methods studies: concurrent, embedded, transformative, multi-phase, sequential exploratory, and sequential explanatory. In the concurrent strategy, the researcher collects both quantitative and qualitative data at the same time, and compares the two databases in order to determine whether there is convergence or divergence. Thus, the mixing occurs at the discussion stage. In the embedded strategy, the researcher collects and analyses quantitative and qualitative data within a traditional quantitative or qualitative design. In the transformative design, the researcher shapes the data within a transformative theoretical framework, and the interaction, timing and mixing are done within the context of the transformative framework. In a multi-phase design, the researcher collects both sequential and concurrent data over a period of time, within a programme of study addressing an overall programme objective.

In a sequential exploratory strategy, the researcher collects and analyses qualitative data in the first stage, while in the second stage the researcher uses quantitative data collection and analysis. In such studies, the principal methods are quantitative, but the use of qualitative methods occurs at the beginning so as to improve the effectiveness of the quantitative research. A sequential explanatory strategy is used in the current study. Here, the researcher

collects and analyses quantitative data in the first phase and then qualitative data in the second stage (Creswell, 2009, Creswell and Clark, 2011) (see Figure11).
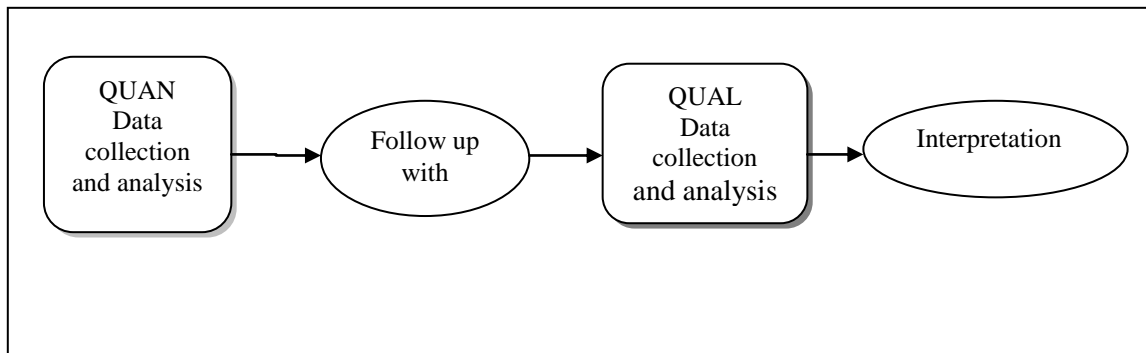
Figure 11: Sequential explanatory strategy

(Creswell and Clark, 2011, p.69)

Thus, this study is carried out based on positivist principles during the first stage, with a deductive approach in order to examine the causal relationships among TL, KS and innovation in both public and private HEIs in Iraq, and then moves on to the assumptions of the interpretivist paradigm with inductive approach in the second stage to get in depth more information for the results that arising from the quantitative stage regarding the differences in the TL practice and the effect relationships among TL, KS and innovation between Iraqi public and private HEIs.

The two stages are separate but connected through the data interpretation and discussion. In such studies, weight is given to the quantitative data, but the qualitative approach is used in the current study to explain and interpret in more detail unexpected results arising from the quantitative stage (Creswell and Clark, 2011). Hence, the use of either a quantitative research methodology or a qualitative research methodology would not be sufficient to fully answer the research questions of the study. The strengths of this strategy are that it is easy to implement and it is easy to describe and report the results (Creswell, 2009, Harrison and Reilly, 2011, Plowright, 2011).

5.5 Questionnaire survey

The survey is a method associated with the deductive approach. It helps the researcher to collect a large amount of data from a sizeable population using a questionnaire (Saunders et al., 2012). According to Bryman (2012), the data collected by using a survey strategy can provide several possible explanations of the relationships between variables and posit models of these relationships. Gray (2009) noted that there are two types of survey: descriptive and analytical. A descriptive survey is designed to measure the characteristics of a particular population at various times and enable the researcher to identify the variability in different phenomena. An analytical survey, on the other hand, attempts to test a theory and to explore whether there is a relationship between the independent variables (the causes of change) and the dependent variables (the subject of change) (Gray, 2009). The purpose of this study's analytical survey based on the study objectives to examine and identify the causal relationships between TL, KS, and product and process innovation.

Saunders et al.(2009) explained that the choice over which questionnaire to use will be influenced by several factors related to the questions and objectives of the research, such as the characteristics of the respondents, the size of sample required for the analysis, and the types and number of questions needed to collect the data. Researchers have distinguished between two further types of questionnaire: self-administered and interviewer-administered (Bryman, 2008, Cooper and Schindler, 2008, Saunders et al., 2012). Self-administered surveys are usually completed by the respondents themselves: this type encompasses three sub-types:1) the delivery and-collection questionnaire, where the researcher delivers the questionnaire by hand to each respondent and collects it later (Gray, 2009). 2) the postal questionnaire, which is sent by post to selected respondents, and 3) internet surveys and email-based surveys administered either via a website or via a word-processed document

attached to an e-mail. Sekaran and Bougie (2011) stated that the main advantage of the third method is that it can be used to cover a wide geographical area.

On the other hand, with interviewer-administered questionnaires, the respondents' answers are recorded by the interviewer. The researcher can collect the data either by one of two methods: 1) In the telephone questionnaire, he/she telephones the respondents and completes the questionnaire based on their answers. This method is the most widely used in survey research, because of the high proportion of the population that has access to household telephones. 2) In the interview questionnaire, sometimes called interview schedules, the interviewers meet the respondents face-to-face and ask them questions directly (Saunders et al., 2012).

An e- survey was ruled out for this study because it was known that the participants would have concerns about their privacy and security (Conway and Thomas, 2003). Therefore, this study used a self-administered questionnaire and the delivery-and-collection method of distribution. This technique is suitable for the Iraqi environment because the participants prefer to deal with paper work. Furthermore, direct contact (face to face) between the researcher and the respondents can induce a greater proportion of people to complete the questionnaire and allows the researcher to explain an ambiguous questions to the participants (Bryman, 2008, Gray, 2009, Sekaran and Bougie, 2011).

5.5.1 Questionnaire design and measures

Measurement is one of the most fundamental parts of research. Saunders et al. (2012) reported that there are two types of questions: open and closed. Open questions, sometimes called open-ended questions, are useful when a researcher is seeking more detailed answers that may require the writing of words or numbers. Although, this type of questions allows respondents to give their answers in their own way, it can become off-putting if the

researcher leaves too much space. On the other hand, closed questions or closed-ended questions provide a number of alternative answers from which the respondents is instructed to choose. The answers can be a range represented by three, five, seven, or more answers ranging from positive to negative, or a yes/no choice. This type of question is easier and quicker for the respondent to answer.

This study used a self-administered questionnaire, as discussed in section 4.5, with closed-ended questions, to collect data from members of staff in public and private HEIs in Iraq. The survey questionnaire was designed to be easy and quick for participants to complete. The layout of the questionnaire encompasses four parts besides the introduction. Bryman (2008) indicated that an introductory paragraph giving information about the research and assuring confidentiality is an important aspect in encouraging participants to complete a questionnaire. In this regard, this study used a cover page, which explained the purpose of the study, and contact details in case the participants should have any further inquiries (see Appendix1).

The questionnaire asked the teaching staff to rate their leaders (Dean (D), deputy of dean (DD), and head of department (HD)) with statements regarding TL, KS, and innovation using a five-point Likert scale ranging from 1= strongly disagree to 5= strongly agree. This scale approximates an interval scale that is commonly used to assess psychometric attributes in social research (Saunders et al., 2009). The measurements for the independent variables (TL and KS) and the dependent variable (innovation) were developed from previous studies.

Part 1:TL was measured using a multifactor leadership questionnaire (MLQ) from which contained 45 questions (Bass and Avolio, 2000). The MLQ (5X) measures TL, transactional leadership, and laissez-faire behaviour in terms of nine leadership constructs, five for TL, three for transactional leadership and one for laissez-faire behaviour. Given the objectives of

this study, as explained in Chapter 1 and 2, transactional and laissez-faire leadership were not measured.

The MLQ has been used extensively in previous studies and has produced valid and reliable results across different cultures (Rohmann and Rowold, 2009, Avolio and Bass, 2002, Bass and Avolio, 2003, Saenz, 2011). It has been tested across industrial settings with different levels of leadership as well in non-homogeneous groupings of leaders (Antonakis et al., 2003). Avolio et al. (1999) used confirmatory factor analysis to check the validity of the MLQ (5X) constructs, and the scale exhibited high internal consistency. Additionally, Judeh (2010) found that the cronbach's alpha was (0.631) for idealised influenced, (0.612) for individualised consideration, (0.650) for intellectual stimulation and (0.834) for inspirational motivation, the dimensions of TL. Tojari et al. (2011) confirmed the validity of the MLQ (5X) and found the internal consistency coefficient Cronbach's alpha to be (0.92) for the four dimensions of TL. Antonakis et al. (2003) also found strong validity and reliability for the MLQ scale based on a confirmatory factor analysis.

In this study, each participant was asked to rate aspects of his/her leadership behaviour related to each of the four TL components: 1) idealised influence, under which style leaders encourage their members of staff to have pride, faith, and respect in themselves and their college. 2) inspirational motivation, through which leaders attempt to stimulate their members of staff by motivating them to get involved in a shared vision for the university, using emotional appeals to group members to focus their efforts so as to gain more than they would if they operated according to their own self-interest. 3) intellectual stimulation, by which leaders promote learning and creativity among staff, and 4) individualised consideration, through which leaders provide satisfaction to members of staff by advising, supporting, and coaching them and listening to their individual needs, thus allowing them to develop and self- actualise. The four TL constructs are highly interrelated (Bass and Riggio,

2006). The scale contained 21 items (questions): 7 for idealised influence, 5 for inspirational

motivation, 5 for intellectual stimulation and 4 for individualised consideration. The complete

scale is shown in Table (12):

Table 12: TL items

TL Items	Researcher/s
Idealised influence Acts in ways that build my respect	(Bass and Avolio, 2000, Avolio and Bass, 2002)
Instils pride in being associated with him/ her	
Talks about values and beliefs that are important to him/her	
Goes beyond self-interest for the good of the group	
Considers the moral and ethical consequences of decisions	
Emphasises the importance of having a collective sense of mission	
Displays a sense of power and confidence	
Inspirational motivation Talks optimistically about the future Talks enthusiastically about what needs to be accomplished	
Articulates a compelling vision of the future	
Expresses confidence that goals will be achieved	
Develops a team attitude and spirit among members of staff	
Intellectual stimulation Re-examines critical assumptions in order to question whether they are appropriate	
Gets me to look at problems from many different angles	
Suggests new ways of looking at how to complete assignments	
Seeks different perspectives when solving problems	
Encourages me to rethink ideas that have never been questioned before	
Individualised consideration Spends time teaching and coaching	
Treats me as an individual rather than just as a member of a group	
Considers me as having different needs, abilities and aspirations to others	
Helps me to develop my strengths	

Part 2: this part of the questionnaire concerned KS, which is described in this study as the exchange of knowledge, experiences, and skills regarding teaching operations and administrative issues among members of staff, through the donating and collecting of knowledge, a definition developed from previous studies. Knowledge donating describes the motivation of academic staff to pass on their own intellectual capital to others (giving). Knowledge collecting, on the other hand, refers to asking others for advice in order to obtain intellectual capital (receiving). The original instrument of Hooff and Weenen (2004) consisted of 12 items which have been proved valid and reliable. The coefficient of Cronbach's alpha in that study was 0.83 for the donating of knowledge and 0.90 for the collecting of knowledge. This scale has been widely used in previous studies (Lin, 2007, Liao et al., 2007, Behery, 2008, Kamasak and Bulutlar, 2010, Tohidinia and Mosakhani, 2010, Alhady et al., 2011, Kim et al., 2013, Cheng, 2012, Abdallah et al., 2012, Tong et al., 2013). Four other items were derived from another two studies (Mogotsi, 2009, Carmeli et al., 2011) and modified so as to be suitable for the Iraqi environment. The Cronbach's alpha coefficient for these was 0.88. Hence, the total number of questions measuring KS in the current study was 16 items, 8 for each dimension. The complete scale is shown in Table 13:

Table 13: Knowledge sharing items

Knowledge sharing items	Researcher/s
Knowledge Donating Knowledge sharing with colleagues outside of my department is considered normal	(Hooff et al., 2003, Hooff and Weenen 2004, Hooff and Ridder, 2004, De Vries et al., 2006)
Knowledge sharing among colleagues in my department is considered normal	
When I have learned something new, I tell colleagues outside of my department about it	
When they have learned something new, my colleagues within my department tell me about it	
When I have learned something new regarding the teaching profession, I tell my colleagues in my department about it	
When they have learned something new, colleagues outside of my department tell me about it	

I share information about the teaching profession with my colleagues in the university	(Mogotsi, 2009, Carmeli et al., 2011)
I share information about administrative issues with my colleagues in the university	
Knowledge Collecting I share any information I have with colleagues within my department when they ask for it	(Hooff et al., 2003, Hooff and Weenen 2004, Hooff and Ridder, 2004, De Vries et al., 2006)
Colleagues within my department share knowledge with me, when I ask them for it	
Colleagues within my department share their skills with me, when I ask them	
I share my skills with colleagues outside of my department, when they ask me to	
I share my skills with colleagues within my department, when they ask me to.	
I share information I have with colleagues outside of my department when they ask me to	
Colleagues in my university share information about the teaching profession with me	(Mogotsi, 2009, Carmeli et al., 2011)
Colleagues in my university share information about administrative issues with me	

Part 3: The dependent variable for this study is innovation, reflecting the acceptance or development of new ideas concerned with product and process. The measurement of innovation was developed from work done in previous studies and modified so as to be suitable for the Iraqi context. Five items measure product innovation, referring to the degree to which members of staff accept, develop, and implement new products such as courses, research projects, teaching materials, and curricula. A further eight items measure process innovation, reflecting the use of new approaches in service and delivery through the development and use of new technology, and the implementing of incentives and reward systems for members of staff. These scales was chosen because they have received the most support from organisational innovation researchers and been subjected to the greatest empirical scrutiny (Obendhain and Johnson, 2004, Liao et al., 2007, Jaskyte, 2004, Liao and Wu, 2010). The items within each variable are listed in Table (14):

Table 14: Innovation items

Innovation items	Researcher/s
Product innovation Our university is always delivering new courses for members of staff	(Perri 6, 1993)
Our university constantly emphasises development and doing research projects	(Perri 6, 1993)
Our university often develops teaching materials and methodologies	(Daft, 1978)
Our university often develops new programmes/services for members of staff and students	(Perri 6, 1993, Skerlavaja et al., 2010)
Our university is extending its programmes/services to new groups of employees not previously served by the university/institute	(Perri 6, 1993, Booz and Hamilton, 1980, Darroch, 2005)
Process innovation Our university is developing new training programmes for staff members	(Perri 6, 1993, Skerlavaja et al., 2010)
Our university encourages teamwork and relationships between staff members	(Perri 6, 1993)
Our university implements an incentive system (i.e. higher salaries, bonuses,--) to encourage members of staff to come up with innovative ideas	(Perri 6, 1993, Skerlavaja et al., 2010, Jaskyte, 2011)
Our university often develops new technologies (internet, databases,--) to improve the educational process	(Daft, 1978)
Our university often uses new technologies to improve the educational process	(Skerlavaja et al., 2010)
New multimedia software is implemented by this university for educational purposes and administrative operations	(Daft, 1978)
This university implements a reward system (i.e. promotions, thank yous,--) for members of staff to encourage them to come up with innovative ideas	(Perri 6, 1993, Skerlavaja et al., 2010, Liao et al., 2007)
Our university is trying to bring in new equipment (i.e. computers) to facilitate educational operations and work procedures	(McGrath, 2001, Ibarra, 1993)

Part 4: This part asked the members of staff for their demographic information, including, type of university/institute, years of experience in HE sector, age, gender, marital status, academic qualifications and profession.

5.5.2 Data analysis for the questionnaire survey

Structural equation modelling (SEM) was used in this study to examine the impact of TL on innovation through the mediating role of KS processes. Hair et al.(2010) described SEM as a family of statistical models that explain the relationships among multiple variables. It is a multivariate technique combining aspects of factor analysis and multiple regression that enables the researcher to estimate the direct and indirect effects of independent variables on dependent variables (Heck and Thomas, 2009, Hooper et al., 2008).

The main function of SEM is to determine the goodness of fit between the hypothesised model and the sample data, whereby the hypothesised model can be tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data. The results support the plausibility of the hypothesised relations between the variables if the goodness of fit is adequate, while the tenability of the relations is rejected if the latter is inadequate (Byrne, 2010, Heck and Thomas, 2009, Blunch, 2012). There are many advantages of SEM over other multivariate procedures, as suggested by Byrne (2010):

- It takes a confirmatory rather than an exploratory approach to the data analysis by demanding that the pattern of inter-variable relations be specified a priori, and lends itself well to the analysis of data for inferential purposes. Other multivariate procedures are descriptive by nature, making hypothesis testing difficult.
- It provides explicit estimates of measurement error, while most of the traditional multivariate procedures are unable to assess or correct measurement error because they assume that any error in the explanatory variables disappears. Thus, using those methods when there is error in the explanatory variables is tantamount to ignoring the error, which may lead to serious inaccuracies. The researcher can avoid such mistakes by using SEM.

- It combines both unobserved and observed variables, unlike other methods that focus on observed measurements only.

- It tests for direct and indirect effects in the multivariate relations, in contrast to traditional methods that test for direct effects only (Raykov and Marcoulides, 2006, Byrne, 2010).

Hair et al. (2010) distinguished between two types of variables, exogenous and endogenous. Exogenous latent variables are factors that cannot be observed directly, and are sometimes called independent variables (i.e. TL and KS in this study). They cause fluctuations in the values of other latent variables in the model. Endogenous or dependent variables (i.e. innovation), are factors that are influenced by the exogenous variables in the model, either directly or indirectly.

SEM establishes a measurement and a structural model to analyse the relations between factors as suggested by (Hair et al., 2010, Loehlin, 2012). The measurement model addresses and evaluates the reliability and validity of the indicators for measuring the hypothetical constructs. The structural model addresses the relations among the unobserved variables, specifying the direct and indirect relations among them. Thus, it deals with the causal relations among the variables according to the proposed hypotheses.

Three strategies for the model evaluation have been reported in the literature (Schumacker and Lomax, 2012, Byrne, 2010, Kline, 2005, Blunch, 2012): strictly confirmatory, alternative, and developing. In the strictly confirmatory strategy, in which the researcher postulates a single model based on the theory, collects the appropriate data, and tests the fit of the hypothesised model to the sample data, the researcher either rejects or fails to reject the model, and no modifications are made to the model. In the alternative model, the researcher attempts to propose several alternative models, all of which are grounded in theory. Then

after analysing the set of empirical data, the researcher select one model as the most appropriate for representing the sample data. Finally, in the model development strategy, the researcher develops or enhances the hypothesised model by modifying the measurement or structural model.

Byrne (2010) asserted that SEM can be just identified, over-identified, or under-identified. In the just identified version there is a one-to-one correspondence between the data and the structural parameters, whereby the number of data variances and covariances equals the number of parameters to be estimated. This type is not scientific because it has no degrees of freedom and can therefore never be rejected. With the over-identified version, the number of estimable parameters is less than the number of data points, which results in a positive number of degrees of freedom that allow for the rejection of the model, thereby rendering it of scientific use. Finally, in the under-identified, the number of parameters to be estimated exceeds the number of variances and covariances. Therefore, the model contains insufficient information from input data. In SEM, the main goal is to have a model that is over-identified (Blunch, 2012, Hair et al., 2010, Loehlin, 2012).

SEM was applied using AMOS (Analysis of Moment Structures) version 20. AMOS chosen for this study due to the availability of the program and training in its use. The researcher attended a course about it and found the program to be beneficial for the statistical analysis to be conducted in this study. AMOS aims to provide the best estimates of the freely varying parameters based on minimizing a function that indexes how well the model fits. It gives the researcher goodness-of-fit measures to help him/her evaluate model's fit (Byrne, 2010). Within SEM, the best method for estimating the parameters of the model is the maximum likelihood (ML), as suggested by Hair et al. (2010) and Blunch (2012), which assumes that the data are univariate and multivariate normal. Since univariate normality is essential but not

sufficient to establish a normal distribution, both univariate and multivariate normality were used.

The literature has reported a set of criteria that can be used to evaluate the goodness of fit of the model (Hooper et al., 2008, Blunch, 2012, Kline, 2005, Byrne, 2010, Loehlin, 2012): Absolute fit indices assess the overall model fit and provide a fundamental indication of how the hypothesised theory fits the data. This includes: χ^2 (chi squared) at p > 0.05, χ^2/df, RMSEA (the root mean square error of approximation) <0.05-0.08 (McDonald and Ho, 2002, Loehlin, 2012, Kline, 2005, Barrett, 2007, McQuitty, 2004, Byrne, 2010). Model comparison indices, compare the proposed model to the null model. The fit indices used most often are: CFI (comparative fit index) which should be close to 0.90 (Tabachnick and Fidell, 2007, Blunch, 2012, Kline, 2005), and an NFI (normed-fit index) of close to 0.90 (Hooper et al., 2008, Barrett, 2007, Blunch, 2012). Parsimonious fit indices, represent the ratio of the degrees of freedom in the model to the degrees of freedom in the independent model. The PNFI (parsimony normed fit index) is one of the parsimony fit indices. This measure is not reported widely in other studies (Loehlin, 2012, Kline, 2005). Table (15) lists the fit indices used in the current study:

Table 15: Fit measure

Fit index	Characterisation	Recommended criteria
χ^2	The key value measure used to evaluate the overall model fit and assess the magnitude of the discrepancy between the sample and fitted covariance matrices.	p>0.05 (Hooper et al., 2008, Blunch, 2012)
χ^2/df	Represents the minimum discrepancy measure divided by its degrees of freedom	≤ 2-5 (Schumacker and Lomax, 2012, Tabachnick and Fidell, 2007)
RMSEA	Evaluates the model by taking the error estimate of the population. It is sensitive to the degrees of freedom and therefore tends to be high for complex models.	< 0.05-0.08 (Hair et al., 2010, Heck and Thomas, 2009, Hooper et al., 2008, Blunch, 2012)
CFI	Compares the existing model fit with that of the null model.	≥ 0.90 (Hooper et al., 2008, Tabachnick and Fidell, 2007).

NFI	Represent the ratio of the differences in χ^2 value for the null model	≥ 0.90 (McQuitty, 2004, Hooper et al., 2008, Byrne, 2010), close to 0.95 (Hair et al., 2010)
TLI	(The Tucker-Lewis index), is a comparison of the normed χ^2 values for the null and specified models.	≥ 0.90 (Tabachnick and Fidell, 2007, Loehlin, 2012)

The construct validity of the measurement model was established through convergent and discrmminant validity. Construct validity, refers to the extent to which a set of measured items actually reflects the theoretical latent constructs those items are designed to measure. It explains how the instrument works and how its application can be interpreted (Loehlin, 2012, Blunch, 2012, Hair et al., 2010, Saunders et al., 2009).

Convergent validity, is the degree to which independent measures of the same phenomenon are correlated (Sekaran and Bougie, 2011). In this study, convergent validity was assessed through a conservative measure average of variance extracted (AVE) as recommended by Fornell and Larcker (1981). AVE reflects the amount of variance that is captured by the construct in relation to the amount of variance that is due to measurement error, and in relation to the magnitudes of the accompanying t-values. AVE is calculated as a mean variance extracted for the items loading on a construct using standardised loadings, as the equation below specifies:

$$AVE = \frac{\sum_{i=1}^{n} Li^2}{n}$$

Where: $Li=$ represents the standardised factor loadings, $i=$ the index for each item, and $n=$ the total number of items. Hair et al. (2010) stated that an AVE of 0.5 or higher suggests adequate convergent validity.

On the other hand, discriminant validity refers to the extent to which a construct is truly different from other constructs (Loehlin, 2012, Blunch, 2012, Hair et al., 2010). The main

goal in establishing discriminant validity is to establish internal consistency (Byrne, 2010). This study evaluated discriminant validity using the rules of Fornell and Larcker (1981). According to them the AVE should be greater than the squared correlation between two constructs.

Furthermore, internal reliability was used in this study to assess the model's Cronbach's alpha (α) and composite reliability (CR). Hair et al. (2010) stated that CR is preferred in SEM as it examines reliability on the basis of actual measurement loadings and leads to higher estimates of true reliability. CR is computed according to equation below:

$$CR = \frac{(\sum_{i=1}^{n} Li)^2}{(\sum_{i=1}^{n} Li)^2 + (\sum_{i=1}^{n} ei)}$$

Where, CR = composite reliability, Li = the factor loading for each construct, and ei = the error variance for each construct. Cronbach's alpha values and CR of 0.70 would indicate internal consistency (Hair et al., 2010).

5.5.3 Validity and reliability of the questionnaire

Collis and Hussey (2009) defined validity as the extent to which the research findings accurately reflect the phenomenon under study. Saunders et al. (2009) noted that the questions used in the instrument must be understood by the participants in the way intended by the researcher, and the answers given by the respondents should be understood by the researcher in the way intended by the respondents. Saunders et al.(2009) suggested three ways of validating a questionnaire, namely content, construct, and external validity. Sekaran and Bougie (2011) stated that content validity explains how well the dimensions and elements of the concept have been delineated. Content validity can be established by asking people with experience and expertise in a field to judge whether, on the face of it, the measure seems to reflect the concept concerned. An alternative method is to review the

literature (Bryman, 2012, Cooper and Schindler, 2008). In this study content validity was established by means of a comprehensive review of the literature, presented in Chapter 2, which identified and evaluated the main issues.

The study also established face validity by garnering comments from people with experience and expertise in this field. First, the researcher distributed the questionnaire to 13 postgraduate students studying management at Plymouth University, and asked them to provide any comments about the questionnaire and whether they understood the questions. Their feedback was related to the wording of some of the statements, the structure, and the layout of the questionnaire. All comments were considered and various changes were made. Second, the questionnaire was sent to one professor and three assistant professors in Iraq, specialising in management information systems, and two senior lecturers in the UK (one in management information systems and the other in leadership and innovation). Their feedback helped with the refinement of the items in terms of using more objective methods for measuring items and better wording (e.g. separating the item on reward systems for innovation providing promotions, or thank yous from that on reward systems providing bonuses. Including an example about new technology and equipment). After these changes were made, the final version of the questionnaire, was translated into Arabic, the mother tongue of the participants, before being pre-tested as recommended by the experts.

The second type of validity, construct validity, refers to the extent to which a set of measured items actually reflects the theoretical latent constructs those items are designed to measure and explains how the instrument works and how its application can be interpreted (Hair et al., 2010). Byrne (2010) stated that in SEM the primary objective of this equation is to assess the construct validity of the proposed theory. Thus, it deals with accuracy of measurement. Construct validity consists of two types convergent and discriminant (discussed in last section). In this study the construct validity are addressed in detail in Chapter 6.

Thirdly, external validity, refers to the research findings, which means the ability of the data to be generalised across populations and research settings (Cooper and Schindler, 2008). In the current study, external validity was established through SEM to assess the hypothesised model.

On the other hand, reliability refers to the extent to which the data collection or analysis procedures used will lead to consistent findings (Saunders et al., 2009).Thus, it is concerned with the robustness of the questionnaire. Sekaran and Bougie (2011) asserted that a measure should not only be valid but also reliable. To examine reliability in this study, Cronbach's alpha values were calculated; values of 0.70 indicate that the constructs have good reliability (Hair et al., 2010).

5.5.4 Pilot test

Sekaran and Bougie (2011) noted that testing questionnaire before the administer it will help the researcher to find out if participants will understand the questions, if the questions mean the same thing to all participants, and how long it takes to complete.

In the pilot test for this study, 46 responses were received from 60 Iraqi academic staff who were sent the questionnaire. Then, Cronbach's alpha values were calculated to establish the reliability (internal consistency) of the questions and to check whether the respondents understood all the questions (Saunders et al., 2009). Item-total correlations also used in this study to assess internal consistency, it reflects how one item is correlated with the other items in a given set of items (Kline, 2005). The purpose of using Item-total correlations is to remove or retain the item in the scale. Field (2009) stated that the correlation should be above 0.30. Accordingly, the Cronbach's alpha values in this study were; 0.854 for all the items, 0.824 for TL, 0.851 for KS, and 0.729 for innovation and all items had values for total

correlations above 0.30. Therefore, no changes were made to the questionnaire (see Appendix 2).

5.5.5 Questionnaire translation

Translating the questionnaire into another language requires the researcher to take care over grammar, syntax, and lexical, idiomatic, and experiential (Saunders et al., 2009). There are four techniques that can be used (Usunier, 1988): 1) In direct translation, the questionnaire is translated directly without any help. Although this method is easy and inexpensive, it may lead to many discrepancies in meaning between source and target questionnaire. 2) In back-translation, the researcher has the source questionnaire translated into a target language and then translated back into the original language by two independent translators, and then makes a comparison of the two new questionnaires in the original language in order to create the final version. 3) In parallel translation, the original questionnaire is translated into the target language by two or more independent translators. Then these two questionnaires are compared in order to create the final version. 4) The mixed technique involves, using back translation undertaken by two or more independent translators, and then comparing the two new original-language questionnaires to create the final version in the target language.

Although, the mixed technique shares advantages with the back-translation method, such as discovering problems of mistranslation, lost words, or incorrect meaning, it is expensive and requires more than two independent translators. Accordingly, this study used the back-translation technique to translate the original English questionnaire into Arabic, and then back into English. The two English-language questionnaires were then compared and discussed with the two translators, some discrepancies, in meaning were found, and the Arabic version was then refined with the help of the two translators.

5.6 Sampling procedures used in the quantitative stage

Sampling refers to the choice of a subset of a population used to derive conclusions about the characteristics of the whole population (Hair et al., 2007). Issues regarding sampling are important in determining the extent to which research findings are generalisable. Saunders et al. (2012) explained that collecting data from a sample that represents the entire population rather than from the entire population is necessary when budget and time constraints prevent the researcher from surveying the entire population. It is argued that using sampling can provide higher overall accuracy than surveying the entire population (Sekaran and Bougie, 2011).

There are two types of sampling mentioned in the literature: probability and non-probability. In probability sampling, sometimes called representative sampling, each case selected is known and all cases are equal, which means that the researcher can achieve the objectives of the research and test the results statistically. This approach is associated with surveys and experimental research. Probability sampling techniques include simple random, systematic, stratified, cluster and multi-stage (Bryman, 2012, Hair et al., 2007).

 In non-probability or judgemental sampling, on the other hand the probability of each case is not known. This type of sampling is usually used in case studies. Again there are many types, such as quota, purposive, snowball, and convenience, but the most commonly used are purposive and convenience (Saunders et al., 2012, Berg, 2012)

The literature has reported that the main advantage of probability sampling is to keep the sampling error to a minimum (Cooper and Schindler, 2008). This type of sampling is more effective than other methods when the population of the study covers a large geographical area and when the researcher can easily access the entire population (Saunders et al., 2009). Since this study uses the questionnaire approach to gather data, and since the research

questions require the researcher to statistically estimate the features of a population, random probability sampling is most appropriate.

5.6.1 Sampling frame

Hair et al. (2007) stated that a sampling frame is a comprehensive list of the elements from which the sample is drawn. The sampling frame in this study is a list of the public and private HEIs registered in (MOHESR's) databases. The target population in this study comprises academic teaching staff at these HEIs (assistant lecturers, lecturers, assistant professors, and professors). The sample chosen offers some advantages for this study: KS plays a critical role in HEIs, in enhancing product innovation relating to curricula, courses, and research projects, and process innovation leading to new services. It is noted that academic staff are one of the most important assets of HEIs and a source of competitive advantage, because of their knowledge creation and sharing activities (Kim and Ju, 2008). According to Schneckenberg (2009), members of staff can define the curricula, and plan study programmes and courses for HEIs. They can communicate and interact with students, regarding teaching, and learning strategies. Youssef et al. (2013) explained that teachers in the HE sector are key to the process of teaching. It is argued that the sharing of teaching and technical experiences among academic staff, including research skills and course-related materials, can improve the performance of individuals as well as the institute itself (Kim and Ju, 2008). Academic staff are equivalent to the brain and blood of any academic institute, as they have the ability to develop the students, personally and professionally (Amin, 2006). Academic experiences are the key to HE and its main competitive resource (Maponya, 2005). Further, Yukl (2010-2013) stated that the rating of leaders by their followers is the best indicator of leadership style, and that followers' opinions could be critical as they are actually involved in the detail of KS aimed at developing product and process innovation. According to the annual report of

MOHESR (MOHESR, 2012), there are 69 public universities, technical colleges and institutes, and 28 private colleges, in Iraq (see Table 16):

Table 16: Public and private HEIs in Iraq by geographical area

City	Public		Private	
	Number of universities and technical institutes	%	Number of colleges	%
Baghdad	17	24.65	14	50.00
Al-Mousel	6	8.70	1	3.57
Al-Basrah	6	8.70	2	7.15
Al-Najaf	5	7.24	3	10.70
Tikrit	2	2.90	1	3.57
Al-Qadisiya	2	2.90	-	-
Al-Anbar	2	2.90	1	3.57
Babylon	4	5.79	2	7.15
Diyala	2	2.90	1	3.57
Karbala	2	2.90	2	7.15
Thi-Qar	3	4.34	-	-
kirkuk	4	5.79	1	3.57
Wasit	3	4.35	-	-
Mysaan	2	2.90	-	-
Al-Muthanna	2	2.90	-	-
Al-Sulaymaniyah	2	2.90	-	-
Arbil	4	5.79	-	-
Dohuk	1	1.45	-	-
Total	69	100%	28	100%

Table 16 shows that 24.65% of the public and 50.00% of the private colleges in Iraq are located in Baghdad. It was to select universities in Baghdad as the sampling frame, for two main reasons: 1) the concentration of universities and the variety of faculties in the city, means there are sufficient numbers of academic staff to which to distribute the questionnaire. 2) it would keep time, costs, and the difficulties of delivering and collecting the questionnaires to a minimum.

5.6.2 Sample size

Before collecting and estimating the characteristics of a large population, it is necessary to determine an appropriate sample size. Saunders et al.(2009) stated that, when statistics are applied to a sample, the researcher is estimating the value for the whole population. Thus, there will be some error and this error is dependent on the size of the sample. They argued that the larger is the sample size, the lower is the error. Sekaran and Bougie (2011) noted that the size of the sample depends on the many factors that need to be taken into account such as the variability of elements in the target population, the type of sample required, the time and budget of the researcher, and the estimation precision and degree of confidence.

This study used a population of 17 public universities and technical institutes with (13,070) members of staff, and 14 private colleges with (693) teaching staff, all based in Baghdad city. Thus, a required precision level of $\mp$ 7% and a 95% confidence level gives a required sample of 200 staff members of public universities and 157 from private colleges, according to the equation below (Glenn, 2003):

$$n = \frac{N}{1+N(e)^2}$$

where:

n = the required size of the sample.

N = the size of the population, and,

e = the level of precision or sampling error.

Hair et al. (2010) asserted that, in SEM, the sample size should be greater than 100 to provide satisfactory statistical power. Thus, according to the results above, the sample size was deemed acceptable for the current study.

Stratified random sampling was used in this study. The main advantages of this type of sampling are that it is accurate, easy, accessible, divisible into relevant strata, and low-cost (Cooper and Schindler, 2008, Hair et al., 2007, Saunders et al., 2009). The researcher divides

the population into two or more significant strata based on one or a number of attributes and then a random sample is selected from each of the strata. In the current study, the universities were divided into colleges, which were further divided into departments, and the numbers of staff members to be chosen from each department were determined according to the total number of teaching staff in that department. Finally, the number was selected according to the random sampling technique. Saunders et al.(2009) noted that this type of sampling is more likely to lead to a representative sample.

Eight public and six private colleges were randomly selected to have questionnaires distributed to them. The researcher contacted each faculty to gain agreement from the deputy dean for scientific affairs to distribute the questionnaires. The researcher explained the contents of the questionnaire and the purpose of the study to the deputy dean. Each questionnaire included a cover letter containing statements assuring the respondents of anonymity and confidentiality. Then, (600) questionnaires were distributed to the public HEIs and (300) to the private colleges between the 1st of September and the 5th of November 2011. The completed questionnaires were collected by the secretary of each department in each faculty and handed personally to the researcher. The response rate for the public HEIs was 380 (63.3%) and that for the private colleges was 248 (82.6%). Of these 253 from the public HEIs and 233 from the private colleges were usable. Table 17 displays the number of usable questionnaires obtained from each faculty:

Table 17: Usable questionnaires received from the public and private HEIs

Public		Private	
Name of college/institute	No.	Name of college	No.
Administration and Economics/ Baghdad	35	College of Al-Rafeden University	45
Administration and Economics/ Al-mustansriya	44	College of Al-Turath University	33
Law/Baghdad	17	College of Meadenat Elelm University	14
Art/Baghdad	18	College of Baghdad for Administrative and Economics Sciences	50
Education/ Al-mustansriya	22	College of Al-Monsour University	45
Art/ Al-mustansriya	25	College of Al-Mamon University	46
Institute of Medical Technology/FTE	48	---	
Technical Institute for Administration/ Al- Russafa/FTE	44	----	
Total	**253**	Total	**233**
486			

A t-test was used to test for non-response bias by comparing the differences between two groups early respondents and late respondents. The t-test of the mean differences was insignificant at the level of 0.05, which confirmed that there was no non-response bias (Hair et al., 2010).

5.7 University profiles

5.7.1 University of Baghdad (public)

To discuss the University of Baghdad and its inception is to discuss the beginning of HE and scientific research in Iraq. The University of Baghdad is not only Iraq's largest scientific institution, but also its first. From it highly trained teaching, technical and administrative cadres have spread to other, more recently founded Iraqi universities. Other public institutions have also benefited from these cadres. The university was founded due to a growing need for HE, High demand amongst the population forced the government of the time to take action.

In 1943, the first committee was formed to look into the possibility of establishing an Iraqi university. In September 1956, the first law was enacted on the establishment of a university in Iraq, bearing the name of 'Baghdad University'. In 1957, the University of Baghdad had its first vice-chancellor (president) and its first Founding Council. The latter was given the task of reviewing the state of any colleges and institutes existing at the time, introducing any changes necessary, and taking the necessary steps towards linking them to the university after ensuring that they had attained a sufficient scientific standard. In 1958, another law concerning the University of Baghdad was enacted, acknowledging the establishment of a university with a council to run its scientific and administrative affairs. At this point, the university comprised the College of Law, the College of Engineering, the College of Education, the College of Medicine, the College of Pharmacy, the College of Arts, the College of Commerce, the College of Agriculture, and the College of Veterinary Medicine. After that, a number of other HEIs became part of the university, namely the Institute of Administrative Sciences, the Institute of Languages, the Institute of Surveying, the High Institute of Industrial Engineering, and the Institute of Physical Education.

In light of the country's development requirements, the University of Baghdad was forced to expand in terms of the number of students enrolled and the scientific and technical cadre besides to extend its scientific activities to other cities in Iraq. As such, the University of Baghdad established a College of Medicine, a College of Sciences, a College of Engineering, a College of Agriculture and Forestry, a College of Pharmacy, a college of Humanities and a Computer Institute in the city of Mosul. In Basra, it established a College of Education, a College of Law and a College of Engineering. Later at the beginning of April 1967, the above colleges became part of the University of Mosul and the University of Basra respectively. Since its inception, the University of Baghdad has been quick to respond to the requirements of the national development plans. It has done so through increasing the number of students it

accepts in all specialties. It has also done so through the creation of new colleges. To date, there are 24 colleges, in addition to 4 institutes for higher studies, namely Regional and Urban Planning, Laser and Plasma, Genetic Engineering and the Institute of Accountancy and Financial Studies.

The University of Baghdad has also responded to the development demands by increasing the number of specialties that offer post-graduate studies, which has entailed increasing the number of students it accepts, in addition to the founding of 20 centres for scientific research. The latest statistics show that 62,561 undergraduate and 2,030 postgraduate students are enrolled at the University of Baghdad and it has a teaching staff of 6,642 (MOHESR, 2012).

5.7.2 College of Administration and Economics (university of Baghdad/public)

The starting point for this college occurred in 1936 when the Institute of Financial Sciences was established as part of the College of Law, with a duration of study of two years. Because of the Second World War, the institute was shut down in 1940. In 1946-1947, the College of Administration and Economics was established although, at the time, it was called the College of Commerce and Economics. This is considered to be the official date of its establishment. It welcomed students in the same year and the first batch of graduate students arrived in 1949-1950. The studies offered by the college were originally general, without specialisation. By 1955-1956, the college was divided into the following departments:

1. Department of Commercial Sciences, including:

    1.1. Department of Accountancy

    1.2. Department of Banking and Insurance

2. Department of Economic Sciences, including:

    2.1. Department of General Economy

    2.2. Department of Agricultural and Industrial Economy (abolished in the same year)

By 1956-1957, specialisation at the college had been narrowed down to just two departments:

1. The Department of Commercial Sciences, and

2. The Department of Economics

In 1963, the college was split into two independent colleges:

1. The College of Commerce: The High Institute of Accountancy, established in 1959 and at the time part of the Al-Ma'rif (education) Ministry, was integrated into this college. Study at the college became general and the courses lasted for four years. The college comprised three departments: The Department of Business Administration, the Department of Accountancy, and the Department of Commercial Law. These departments, would collectively award graduates a Bachelor's degree in Commerce.

2. The College of Economics and Political Sciences: This college was made up of the Department of Economics, which was one of the departments of the former College of Commerce and Economics, the Department of Political Sciences, which had formerly belonged to the College of Arts and the Department of Applied Statistics.

The year 1968 saw a drastic change which contributed towards establishing the College of Administration and Economics, as it is today as the College of Commerce and the College of Economics and Political Sciences were merged. The duration of study at the college was four years. The college currently includes six departments: Economics, Business Administration, Statistics, Accounting, General Administration, and Industrial Management. In 2011, 5,464 undergraduate and 133 postgraduate students were enrolled and there were 295 teaching staff.

5.7.3 College of Law (University of Baghdad/public)

Iraqis who had studied at the Ottoman School of Law in Istanbul, founded in 1886, played a key role in establishing the College of Law in Baghdad. Some of them went on to hold key

positions in Iraq after graduating from Istanbul school. Some held judicial and administrative positions, in addition to working in the field of law. They called for the establishment of a school of law in Baghdad, which would save students the burden of travelling to and living in Istanbul.

The College of Law was founded in 1908, before the founding of the modern Iraqi State in 1921. It aims to create law specialists to work in the various fields of public service, and to carry out activities such as implementing the law. It also aims to create highly skilled specialists in the various law departments to encourage scientific research in the various fields of legal studies, and to invigorate and develop the legislative movement in the country. The college comprises four departments: General Law, Private Law, International Law, and Criminal Law. It has 46 teaching staff, 1,062 undergraduates, and 30 postgraduates according to the latest statistics.

5.7.4 College of Arts (University of Baghdad/public)

This college was founded in 1949 and offers the following specialisations: English language, Arabic language, Psychology, Philosophy, History, Geography, Archaeology, and Sociology. The college aims to disseminate, deepen, develop, and transmit knowledge to individuals. Educate and train the community, and link the activities and requirements of the college with the country's development plans. Furthermore, the college aims to boost science and scientific research to the highest level and embrace the scientific competencies. The latest statistics show that 3,636 undergraduate and 448 postgraduate students are enrolled, and the college has 285 members of the faculty.

5.7.5 University of Al-Mustansiriyah (public)

Al-Mustansiriyah University is one of the public educational institutions in Iraq. It was the second university to be established in 1963, and is now one of 24 state-owned universities in

the country. Its name, however, traces back to the Islamic School, which was one of the oldest Islamic universities in the world, founded in 1227 by Abbasid caliph al-Mustansir. Currently, the university has 12 colleges: Medicine, Dentistry, Pharmacy, Engineering, Sciences, Law, Arts, Education, Administration and Economics, Political Sciences, Basic Education, and Physical Education. It also has five centres: Computers, Hematology, Cancer, Diabetes, and the Arab International Studies Centre. The university has 3,399 teaching staff, 40,108 undergraduates, and 1,330 postgraduate students according to the latest statistics (MOHESR, 2012)

5.7.6 College of Education (Al-Mustansiriyah University /public)

This was established in 1976 and offers the following specialisations: History, Geography, Physics, Educational and Psychological Sciences, Methods of Teaching Al-Quran Al-kareem, Educational Guidance, Mathematics, and Computers. The objective of the college is to produce graduates in specialties that are needed by the Ministry of Education to teach in secondary schools. The latest statistics show that 4,451 undergraduate and 345 postgraduate students are enrolled in the college and it has 310 teaching staff.

5.7.7 College of Administration and Economic (Al-Mustansiriyah University/public)

This faculty was founded in 1963 and aims to produce graduates to work in all state institutions and other sectors, in the following specialisation: Business and Administration, Accounting, Economics, Statistics, and Tourism. Currently the faculty has 149 academic staff, 3,875 undergraduates, and 93 postgraduate students.

5.7.8 College of Arts (Al-Mustansiriyah University/public)

This college was established in 1963 and offers the following courses: Arabic language, English language, Translation, Anthropology Libraries and Information, History, Psychology, French language, and Philosophy. The college's objectives are to produce skilled graduates

and prepare its students to work at a high level in their field of specialty. The faculty has 210 staff, and the college has 4,402 undergraduate and 202 postgraduate students as of the latest statistics.

These universities all aim to produce graduates in different areas of specialisation, and offer B.Sc, M.Sc, and Ph.D qualifications.

5.7.9 Institute of Medical Technology/Mansour (public)

This institute was founded in 1966 and offers the following specialisations: Pathological Analysis, Pharmacy, Electronics, Vision Screening, Health Administration, and Criminal Administration. The institute's objectives are to cover the need for skilled manpower in the field of paramedical services, and to qualify students to work in hospitals and medical centres. Currently, it has 1,474 students and a 107-strong teaching staff.

5.7.10 Technical Institute for Administration/Al- Russafa (public)

This institute was established in 1969 and offers the following specialisations: Accounting, Office Management Techniques, Techniques of Materials Management, Statistics, Banking and Finance, Information and Libraries, and Computer Systems. The institute aims to produce graduates with high qualifications to work in all state institutions and other sectors. The latest figures show that 2,981 students are enrolled and 183 faculty members are employed.

These public universities have faced and continue to face a number of challenges and changes in terms of their structures, curricula, approaches, hardware, and software, particularly in view of the political instability in Iraq over the last two decades.

The following sections will describe the private institutes in this study's sample.

5.7.11 Al-Turath University College (private)

This college was founded in accordance with MOHESR's ministerial order number MW 8/473 on 12th January 1988. It was the first private college in Iraq and was covered by the amended law on private universities and colleges, law number 13 in the year 1996, which included rules regulating the work of private colleges. The college aims to promote university culture and scientific research, and to contribute to quantitative and qualitative developments in science, education, and culture in the various fields of theoretical and applied knowledge. The college awards Bachelor's degrees in the following specialties: Law, Business Administration, Accountancy, English Language, and Computer Science. These Bachelor's degrees are subject to the rules of evaluation of scientific and academic degrees adopted by MOHESR and are equivalent to the degrees awarded by public universities. The latest statistics show that 304 students are enrolled in the college and the number of teaching staff is 45.

5.7.12 Al-Rafidain College University (private)

This college was established in 1988 and aims to produce graduates specialising in Computer Sciences, Statistics, Business Administration, Engineering Sciences, Law, Dentistry, Computers and Communications, Computer Techniques, Accounting, Pharmacology, Refrigeration and Air Conditioning. The college currently has 7,808 students and 96 members of staff.

5.7.13 Madenat Al-elem College University (private)

This college was founded in 2005 under the ministerial order H/217 and offers the following programmes: Computer Techniques, Law, Accounting, and Life Sciences. The college aims to prepare skilled graduates in different specialties to work in the government, private and corporate sectors. The latest statistics show the number of students enrolled to 1,607 and the number of teaching staff to be 36.

5.7.14 Baghdad College University for Economics and Administration (private)

This college was established under ministerial order KM/2/1902 in 1995 and specialises in Business Administration, Computer Sciences, Software Engineering, Banking and Finance, and Accounting. Its aim is to produce skilled graduates and to prepare its students to work at a high level in their field of specialty. The number of teaching staff is 200 and it has 2,500 students currently.

5.7.15 Al-Mansour College University (private)

This college was founded in 1988 and offers specialised programmes in Computer Communication Engineering, Computer Sciences and Information Systems, Computer Technology, Software, Engineering, Law, Accounting and Banking Sciences, English Language, Business Administration, and Civil Engineering. It has 63 members of staff and 2,450 students according to the latest figures.

5.7.16 Al-Mamun College University (private)

This college was established in 1990 and offers the following courses: Business Administration, History, Geography, Law, Translation, English Language, Computer Sciences, Computer Communication Engineering, Computer Technology, and Pathological Analysis. The latest statistics show the number of students enrolled to be 5,661 and the number of teaching staff to be 132.

5.8 Data preparation and screening

Hair et al.(2010) stated that missing data may have an impact on analysis and statistical results, making them biased and invalid. Thus, this study filtered the usable questionnaires before proceeding to the data analysis. Questionnaires 10% missing data and repeatable answers were ignored as recommended by (Field, 2009, Hair et al., 2010).

All data were entered into the SPSS software version 20 and coded as shown in Table 18 for

the data analysis, which will be explained in the next chapter.

Table 18: Coding the questionnaire

Construct	Code in SPSS	Description in the questionnaire	Values	Measures
Idealised influence	ID1-1D7	1-7	5 point	Scale
Inspirational motivation	IM8-IM12	8-12	5 point	Scale
Intellectual stimulation	IS13-IS17	13-17	5 point	Scale
Individualised consideration	IC18-IC21	18-21	5 point	Scale
Knowledge donating	KD22-KD29	1-8	5 point	Scale
Knowledge collecting	KC30-KC37	9-16	5 point	Scale
Product innovation	PD38-PD42	1-5	5 point	Scale
Process innovation	PC43-PC50	6-13	5 point	Scale
Gender	1=Male 2=Female	a) Male b) Female	2 options	Nominal
Marital status	1=Single 2=Married 3=Divorced 4=Widowed	a)Single b)Married c)Divorced d)Widowed	4 options	Nominal
Age	1=<25 years 2=30-39 3=40-49 4=50-59 5=>60	a) ≤ 25 years b) 30-39 c) 40-49 d)50-59 e) ≥60	5 options	Nominal
Tenure	1=<10 years 2=11-15 3=16-20 4=21-25 5=>26	a)≤ 10 years b) 11-15 c) 16-20 d) 21-25 e) ≥ 26	5 options	Nominal
Academic qualifications	1=Bachelor's 2=High diploma 3=Master's 4=PhD	a)Bachelor's b)High diploma c)Master's d)PhD	4 options	Nominal
Academic position	1=Assistant lecturer 2=Lecturer 3=Assistant professor 4=Professor	a)Assistant lecturer b)Lecturer c)Assistant professor d) Professor	4 options	Nominal
Type of college/institute	1=Public 2=Private	a)Public b)Private	2 options	Nominal
College name/private	1=College of AL-Rafeden 2=College of Al-Turath 3=College of Meadenat Elelm 4=College of Baghdad for administrative and Economics sciences	-------------	Open question leading to a nominal measure with 6 options	Nominal

	5=College of Al-Monsour 6=College of Al-Mamon			
College name/public	1= Art/M 2= Education/M 3=Administration and Economics/M 4=Administration and Economics/ B. 5=Law/B 6=Art/B 7= Institute of medical technology/FTE 8= Technical institute for administration/ Al-Russafa/FTE	------------	Open question leading to a nominal measure with 8 options	Nominal

5.9 Qualitative stage

5.9.1 Interviews

Gray (2009) defined an interview as a conversation between people, whereby one of them assumes the role of a researcher. Interviews are used in research to collect primary data by asking the participants questions to find out what they do, feel or think (Collis and Hussey, 2009). Interviews are helpful in investigating complex issues and enable the researcher to obtain feedback (Hair et al., 2007).

The literature has reported three kinds of interviews: structured, semi-structured, and unstructured (Collis and Hussey, 2009, Saunders et al., 2009, Berg, 2012, Bernard and Ryan, 2010). In structured interviews, sometimes-called standardised interviews, the researcher uses a pre-prepared questionnaire and standardised questions. Semi-structured and unstructured interviews, or in-depth unstructured interviews, can be led by a list of questions and themes to be covered. This type of interview allows for the probing of views and opinions from the interviewees to explore their answers in depth and get them to expand on their answers (Bernard and Ryan, 2010).

Saunders et al. (2009) explained that qualitative interviews consist of two different methods, according to the interaction that occurs between researcher and participant: one-to-one and one-to-many. One-to-one interviews can be conducted in three different ways: 1) Meeting the interviewees face-to-face. This can help the researcher to adapt the questions as necessary, to ensure that the responses are properly understood through repeated questions, and to clarify any doubts about the topic (Bryman, 2008). 2) Telephone interviews and 3) online interviews allow the researcher to conduct more interviews with interviewees from a wider geographic area at the same time and more quickly. They are also low-cost as they save on travel expenses (Cooper and Schindler, 2008). One-to-many interviews, alternatively known as focus groups are conversations between a group of people and a researcher, led by a moderator who facilitates the interview and guides the group to exchange ideas, feelings, and experiences on a specific topic.

In this study, the researcher, used semi-structured face-to-face and telephone interviews to collect the data for the qualitative stage.

5.9.2 Sampling of the interviewees

The population used for the qualitative stage of this study consists of leaders in positions such as dean (D), deputy dean (DD), and head of department (HD) who have contact with the teaching staff at the same institute. These leaders were chosen as they play an important role in encouraging and adopting strategies for KS and stimulating teaching staff to engage in product and process innovation.

Eight public and six private colleges located in Baghdad were used in the quantitative stage. During the quantitative data collection process, the researcher obtained permission to conduct interviews with relevant leaders, from the Deputy Dean for Scientific Affairs at each HEI. Thus, purposeful sampling was used in this study, whereby particular persons were

deliberately selected due to the important information they could provide that could not be obtained from other sources. This approach is appropriate when the researcher wants to select cases that will be informative (Saunders et al., 2009).

Many strategies for purposive sampling have been reported in the literature (Bryman, 2008, Teddlie and Yu, 2007, Bernard and Ryan, 2010, Berg, 2012, Cooper and Schindler, 2008): extreme case, heterogeneous, homogeneous, and critical case sampling. Extreme case sampling, focuses on special cases and enables the researcher to answer his/her questions based on the data collected from these unusual outcomes. In heterogeneous maximum variation sampling, the data collected enable the researcher to explain the key themes from different cases. In homogeneous sampling, the researcher focuses on one particular group, in which all the sample members are similar, enabling the researcher to study that group in more depth. Finally, critical case sampling works by selecting critical cases on the basis that they are important for answering the research questions. Kervin (1999) noted that this approach is reasonable in terms of costs and that the researcher is able to control the sample contents. Hence, in this study, purposive sampling with critical case sampling was adopted for the qualitative data collection.

A selection criterion was used to choose the participants so as to reduce bias and again wider in-depth, information about the research questions (Silverman, 2010). The inclusion criterion was tenure in their current position as a leader of more than one year. This provided 80 leaders within the eight public and 54 within the six private HEIs. A pre-screening process was used to identify leaders who satisfied the criterion and arrange interviews with them. Personal information was obtained from the human resources department of each HEI. 55 leaders within the public and 40 within the private HEIs who met the inclusion criterion. Agreed to participate in the interviews was 5 leaders in public and 5 in private colleges (please see appendix 4).

5.9.3 Interview questions and analysis

Berg (2012) pointed out that in explanatory studies semi-structured interviews are commonly used because they help to explain the themes that have emerged from the results of the quantitative survey. Hence, this study used open-ended and probing questions for elaboration and clarification (Saunders et al., 2012). These questions were developed from the quantitative results. The aim of using a qualitative approach in this study was to explain and understand the differences in TL behaviours and their impacts on KS and product and process innovation, as well as the effect of KS on innovation across groups (see Appendices 3 and 4). The interviews were recorded with the permission of the interviewees to facilitate the translation and transcription of their answers for the data analysis. Saunders et al.(2009) noted that this method allows the researcher to: concentrate on asking questions and listening to the answers listen to the interview more than once, provide an accurate and unbiased record, and use direct quotes. All interviewees were assured confidentiality and told that their names would not be identified in the transcripts of the interviews as requested.

The interviews were conducted in Arabic and the answers given by the leaders at the HEIs were translated into English. The data were analysed using NVivo 9 software, which was available to the researcher. Collis and Hussey (2009) noted that such software can help the researcher to structure, code and display summaries of the data. NVivo software can help the researcher to automate searching, facilitated code construction, comparison and to create models of what the data represents (Mackey and Gass, 2012). Demboweki and Lloyed (1995) identified the following ways in which it can assist the interpretivist: importing text, storing and coding the data, searching and retrieving text segments, stimulating interaction with the data, and building a relationship with the data.

Thus, the interviews were copied in the word (doc.) and scanned more than once by the researcher so as to extract the key themes. Then, the transcribed interviews were arranged

into categories, here the researcher discussed with her colleagues who also undertaken the qualitative data analysis approach in their studies about categorisation of the theme. Then the categories entered into NVivo software. Next, the subject were arranged into themes by using "Node" function in the NVivo software, "Node" provide the storage areas in NVivo for references to coded text and represent any categories including concepts, people, organisations or places. It can be managed in two ways: free nodes-unorganised coding and tree nodes as hieratically organised. The researcher initially predetermined the codes by highlighting the text via the mouse and pulls the highlighted text to the identified node. Findings were extracted and the quotation of the interviewees included in the analysis so as to ensure validity and reliability.

5.9.4 Validity and reliability

Saunders et al. (2009) identified three important issues related to semi-structured interviews (in qualitative research): reliability, bias and validity. Reliability refers to whether alternative research would reveal similar information (Berg, 2012), while validity is concerned with the extent to which the researcher gains access to the participants' knowledge and experience. There are two types of bias that should be considered in qualitative research: interviewer, and response bias. To avoid bias and ensure reliability and validity, Saunders et al.(2007) suggested the following methods:

- The researcher should plan and prepare for the interviews in advance, to prevent poor performance.
- The researcher should provide the participants with a list of interview themes before the event, to enable the interviewees to prepare themselves for the discussion in which they are to engage.

- The researcher should establish good relationships with the participants, to create a confidential climate and make the interviewees relaxed and open about the information they are willing to discuss.

- The researcher should ask clear questions.

- The researcher should provide the interviewees with a reasonable amount of time, listen to their explanations, and make notes and record the interviews.

In this study, validity and reliability were established using all of the above methods.

5.10 Summary

In this chapter, the methodology chosen to reach this study's goals has been discussed. This study used a mixed methods approach with multiple-paradigms. The deductive and inductive approaches were used to answer the research questions. A self-administered questionnaire with closed-ended questions was used to collect data from teaching staff in public and private universities in the quantitative stage. Semi-structured interviews with open and probing questions were conducted with leaders from the universities in the qualitative stage.

A sequential explanatory strategy was used in this study, consisting of two stages. A quantitative survey was used in the first stage to test the causal relationships in the hypothesised model. Interviews were used in the second stage to explain the results from the quantitative stage. Quantitative analysis is presented in the following chapter.

CHAPTER SIX: DATA ANALYSIS AND FINDINGS

6.1 Introduction

This chapter presents the data analysis techniques used to examine the impact of TL on innovation through the mediating role of KS in public and private universities in Iraq. SEM with AMOS 20 was employed in this study to test the hypothesised causal relationships. SEM helps to build models, reflects complex relationships and analyses both direct and indirect effects. It consists of two steps: a measurement model to evaluate the construct validity of the model, and a structural model to test and evaluate the causal relationships among the factors. To compare the model between groups, multi-group invariance was used. Invariance testing usually starts with arrows in the measurement model from factor to indicator and then tests the structural arrows linking the factors. These analyses are preceded by descriptive statistics, a measurement model (validity) for each sector, the invariance of the model and the testing of hypotheses.

6.2 Description of sample

This section describes the demographic characteristics of the participants from the public and private colleges, as shown in Table (19). In the public universities, the percentage of female participants was (55%). For marital status, the distribution was (34%) single, (45.8%) married, (16.7%) widowed and (3.5%) divorced. The participants were grouped into five age categories: 3.1% were 29 years or under, 11.0% were aged (30 to 39), 30.5% were aged (40 to-49), 33.6% were aged (50 to 59), and 21.8% were aged 60 or over. In terms of tenure, (4.3% had held their position) for up to 10 years, (10.2%) had held theirs for (11 to 15 years), 26.8% for (16 to 20 years), 31.2% for (21 to 25 years), and 27.5% for 26 years or more.

Assistant lecturers made up (15.8% of the sample), lecturers (39.0%), assistant professor (32.6%), and professor (12.6%). The responses were also grouped according to academic qualifications, as Table 19 shows the proportion of respondents with a Bachelor's degree was (2.0%), with a high diploma (2.7%), Master's (30.0%), and a doctorate (65.3%). Thus, the majority of the respondents held either a Master's or a doctorate.

Within the private colleges, Table (19) shows that (60.5%) were male and (39.5%) female. For marital status, in the private colleges the majority were married (52.0%), the single participants made up (38.0%) of the sample, widowed (9.0%) and divorced (1.0%). Regarding age, (50-59 years olds made up 33.9%), (60 years or older made up 26.1%), (29 years or under made up 16.0%), (40-49 years olds made up 13.3%), and (30-39 years olds made up 10.7%) of the sample.

In terms of tenure, (participants with 21-25 years of service made up 29.6%) of the sample, those with up to (10 years made up 24.0%), those with (16-20 years made up 16.3%), those with (25 years or more made up 16.7%) and those with (11-15 years of service made up 13.4%) of the sample. Lecturers comprised (39.4%), assistant lecturers 25.7%, assistant professors (24.2%) and professors (10.7%). The private colleges were characterised by lower education levels: (4.7%) had only a high diploma and 95.3% had a postgraduate degree.

Table 19: Demographic statistics of the sample from the public and private HEIs

Characteristic	Group	Public N=253		Private N= 233		Overall sample N=486	
		No.	%	No.	%	No.	%
Gender	Male	114	45.0	141	60.5	255	52.5
	Female	139	55.0	92	39.5	231	47.5
Marital status	Single	86	34.0	90	38.0	176	36.3
	Married	116	45.8	122	52.0	238	48.9
	Divorce	9	3.5	2	1.0	11	2.3
	Widowed	42	16.7	19	9.0	61	12.5

Age	≤ 29	8	3.1	37	16.0	45	9.2
	30 - 39	28	11.0	25	10.7	53	11.0
	40 - 49	77	30.5	31	13.3	108	22.3
	50 - 59	85	33.6	79	33.9	164	33.7
	≥ 60	55	21.8	61	26.1	116	23.8
Tenure	≤ 10 years	11	4.3	56	24.0	67	13.7
	11 – 15 years	26	10.2	31	13.4	57	11.7
	16 – 20 years	68	26.8	38	16.3	106	21.8
	21 – 25 years	79	31.2	69	29.6	148	30.5
	≥ 25 years	69	27.5	39	16.7	108	22.3
Academic profession	Assistant lecturer	40	15.8	60	25.7	100	20.5
	Lecturer	98	39.0	92	39.4	190	39.2
	Assistant professor	83	32.6	56	24.2	139	28.6
	Professor	32	12.6	25	10.7	57	11.7
Academic qualifications	Bachelor's	5	2.0	-	-	5	1.2
	High diploma	7	2.7	11	4.7	18	3.7
	Master	76	30.0	91	39.1	167	34.3
	Ph.D	165	65.3	131	56.2	296	60.8

Note: No. = number, % = percentage

6.3 Descriptive data analysis

Byrne (2010) indicated that data screening is very important when the researcher decides to employ SEM before testing the measurement model, so as to ensure that no assumptions of the model are violated which may cause problems with the estimations. In this regard, Hair et al. (2010) argued that the factors in SEM are taken from a multivariate normal distribution, and the maximum likelihood (ML) method requires data that are univariate and multivariate normal. Univariate normality is important but not sufficient for establishing a multivariate normal distribution. For this reason, tests for multivariate normality were conducted in this study. According to Field (2009), kurtosis and skewness are suitable measures for normal distributions and should be within the 2 to -2 range. A skewed variable mean is not at the centre of the distribution, while kurtosis explains the peak of the distribution.

Table (20) shows that the absolute values of kurtosis and skewness for the three constructs ranged from (0.231) to (0.639) for the public universities, and from (-0.235) to (-0.560) for the private colleges. Therefore, the normality of the data in this study can be accepted. In addition to the normality, Table (20) shows the means and the standard deviations as well. In the public sector the mean ranged from (3.026) to (3.519), and the standard deviation from (0.870) to (0.932) for TL. KS ranged from (3.292) to (3.544) (mean) and from (0.860) to (0.897) for the standard deviation. Innovation ranged from (3.195) to (3.458) (mean) and from (0.780) to (0.885) standard deviation. In the private colleges the means and SDs ranged from (2.930) to (3.440) (mean) and from (0.877) to (0.989) standard deviation for TL, KS from (3.220) to (3.450) (mean) and from (0.881) to (0.988), and from (3.157) to (3.240) (mean) and from (0.872) to (0.876) standard deviation for innovation.

Table 20: Descriptive analysis for the constructs in public and private colleges

Constructs	Dimensions	Public N=253				Private N= 233			
		Mean	S.D	Skewness	Kurtosis	Mean	S.D	Skewness	Kurtosis
Transformational leadership	Idealised influence	3.026	0.889	-0.437	-0.368	3.107	0.877	-0.306	-0.716
	Inspirational motivation	3.321	0.870	-0.557	-0.368	3.440	0.930	-0.508	-0.235
	Intellectual stimulation	3.483	0.932	0.639	0.240	3.300	0.989	-0.560	0.345
	Individualised consideration	3.519	0.883	0.548	0.322	2.930	0.968	0.467	0.607
Knowledge sharing	Donating	3.292	0.897	-0.365	-0.496	3.220	0.988	-0.239	-0.652
	Collecting	3.544	0.860	0.598	0.231	3.450	0.881	0.449	0.508
Innovation	Product	3.195	0.780	-0.331	0.421	3.157	0.876	-0.329	0.440
	Process	3.458	0.885	-0.359	-0.656	3.240	0.872	0.383	-0.533

Note: SD = standard deviation

6.4 Structural equation modelling

6.4.1 Factor analysis

Byrne (2010) defined factor analysis as a statistical procedure for investigating the relation between a set of observed and latent variables. It is concerned with the extent to which the observed variables are generated by the underlying latent constructs, which in turn depends on the strengths of the regression paths from the factors to the observed variables. Factor analysis provides and specifies the unit of analysis, helps with data summation, and the reduction of the data (Hair et al., 2010).

Two types of factor analysis are reported in the literature (Field, 2009, Tabachnick and Fidell, 2007, Blunch, 2012): exploratory factor analysis (EFA), and confirmatory factor analysis (CFA). EFA is designed to determine whether the factors are correlated or not. It is conducted without knowing how many factors really exist. Thus, it involves determining the number of factors and the pattern of the factor loadings. Thus, EFA is used to define the relationships between factors and then uses multivariate techniques to estimate the relationships. Hence, it is considered to be more of a theory generator than a theory procedure (Blunch, 2012). On the other hand, CFA is used when the researcher has some knowledge of the underlying latent variable structure and wants to determine the internal reliability of a measure. Hair et al.(2010) explained that EFA is unlike CFA because the latter is related to the testing of the theory underlying latent processes and enables the researcher to either confirm or reject the theory.

In order to determine the dimensions of the variables in each construct (factor loadings that could be used in CFA), in this study EFA was used first of all to screen the data before SEM was employed to refine and validate the data (Hair et al., 2010). The EFA was run using

SPSS software version 20 for both sectors (public and private 486), with 50 items: 21 for TL, 16 for KS, and 13 for innovation.

The results from SPSS indicated that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was equal to 0.765. According to Field (2009), the value should be above 0.50. Thus, the value obtained in the current study reflects that the variables are valid for factor analysis. Consequently, factor analysis was run.

Bartlett's Test of Sphericity indicated that the chi-squared value was (8638.351) with 496 df ($p< 0.01$) (Hair et al., 2010), which supported the validity of the initial variables and indicated that all initial variables were uncorrelated as shown in Table (21):

Table 21: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.765
Bartlett's Test of Sphericity	Approx. Chi-Square	8638.351
	df	496
	Sig.	.000

Principal component factor analysis the most commonly used approach in factor analysis, was used with varimax rotation to produce factors that were linearly independent (Field, 2009). To determine the number of items to be retained, eigenvalues greater than 1 were looked for, as suggested by Hair et al. (2010). Table (22) shows that there were eight factors remaining after 18 items below 0.4 were eliminated.

Table 22: Results of EFA (rotated component matrix)

Items	Factors						7	8
	1	2	3	4	5	6		
Instils pride in being associated with him / her	**0.165***							
Goes beyond self-interest for the good of the group	0.829							
Talks about his / her important values and beliefs	**0.145***			Idealised influence (F1)				
Emphasises the importance of having a collective sense of mission	0.893							
Considers the moral and ethical consequences of decisions	**0.156**							
Acts in ways that build my respect	0.832							
Displays a sense of power and confidence	0.845							
Articulates a compelling vision of the future		**0.198***						
Talks optimistically about the future regarding teaching operation and administrative issues		0.800					**Construct 1**	
Talks enthusiastically about what needs to be accomplished		0.880		Inspirational motivation (F2)				
Expresses confidence that goals will be achieved		0.867						
Develops a team attitude and spirit among members of staff		0.885					**TL**	
Re-examines critical assumptions to question whether they are appropriate			0.757					
Suggests new ways of looking at how to complete assignments			**0.191***	Intellectual stimulation (F3)				
Seeks different perspectives when solving problems			0.877					
Gets me to look at problems from many different angles			0.863					
Encourages me to rethink ideas that have never been questioned before			0.839					
Spends time teaching and coaching				0.863				
Treats me as an individual rather than just as a member of a group				0.870				
Considers me as having different needs, abilities and aspirations than others				0.822				
Helps me to develop my strengths				0.722	Individualised consideration (F4)			

Knowledge sharing with colleagues is considered normal outside of my department		Knowledge donating (F5)	0.803	
Knowledge sharing among colleagues is considered normal in my department			**0.054***	
When I have learned something new, I tell colleagues outside of my department			**0.166***	
When they have learned something new, my colleagues within my department tell me about it			0.816	
I share information about the teaching profession with my colleagues in the university			**0.334***	
I share information about administrative issues with my colleagues in the university	**Construct 2**		**0.179***	
When I have learned something new regarding the teaching profession, I tell my colleagues in my department about it.			0.800	
When they have learned something new, colleagues outside of my department tell me about it			0.800	
I share information I have with colleagues within my department when they ask for it.	**Knowledge**	Knowledge collecting (F6)	0.846	
Colleagues in my university share information about the teaching profession with me.	**Sharing**		0.891	
Colleagues within my department share knowledge with me, when I ask them to.			**0.169***	
Colleagues within my department share their skills with me, when I ask them to			**0.236***	
I share my skills with colleagues outside of my department, when they ask me to			**0.161***	
I share my skills with colleagues within my department, when they ask me to			0.859	
I share the information I have with colleagues outside of my department, when they ask me to			0.860	
Colleagues in my university share information about administrative issues with me			**0.311***	

Our university is delivering new courses for members of staff			0.837
Our university constantly emphasises development and doing research projects			**0.135***
Our university often develops new programmes/ services for members of staff and students		Product	0.776
Our university is extending programmes/services to new groups of employees not previously served by the university		(F7)	0.862
Our university often develops new teaching materials and methodologies			0.796
Our university is developing new training programmes for staff members.			0.765
Our university often uses new technologies to improve the educational process			**0.241***
New multimedia software is used by this university for educational purposes and administrative operations	**Construct 3 Innovation**		**0.324***
Our university is trying to input new equipment to facilitate educational operations and work procedures		Process	0.800
Our university encourages teamwork and good working relationships between staff members.		(F8)	**0.280***
This university is implementing a reward system (i.e. promotions, thank----yous) to encourage members of staff to come up with innovative ideas			0.839
Our university is implementing an incentives system (i.e. higher salaries, bonuses---) to encourage members of staff to come up with innovative ideas			**0.270***
Our university often develops new technologies to improve the educational process			0.765

Note: Loading with (*) Refers to items that were deleted after the running of the EFA.

Table (22) shows the three constructs used in the model: 1) TL consisting of four factors, idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, 2) KS including two factors, donating and collecting knowledge, and 3) innovation, divided into product and process.

The components of the model can be formulated as follows statistically:

Transformational leadership (TL1-TL16):

1. Idealised influence (ID1-ID4)

- 0.832 Acts in ways that build my respect (ID1)

- 0.829 Goes beyond self-interest for the good of the group (ID2)

- 0.893 Emphasises the importance of having a collective sense of mission (ID3)

- 0.845 Displays a sense of power and confidence (ID4)

2. Inspirational motivation (IM5-IM8)

- 0.800 Talks optimistically about the future regarding teaching operation and administrative issues (IM5)

- 0.880 Talks enthusiastically about what needs to be accomplished (IM6)

- 0.867 Expresses confidence that goals will be achieved (IM7)

- 0.885 Develops a team attitude and spirit among members of staff (IM8)

3. Intellectual stimulation (IS9-IS12)

- 0.757 Re-examines critical assumptions to question whether they are appropriate (IS9)

- 0.877 Seeks different perspectives when solving problems (IS10)

- 0.863 Gets me to look at problems from many different angles (IS11)

- 0.839 Encourages me to rethink ideas that have never been questioned before (IS12)

4. Individualised consideration (IC13-IC16)

- 0.863 Spends time teaching and coaching (IC13)

- 0.870 Treats me as an individual rather than just as a member of a group (IC14)

- 0.822 Considers me as having different needs, abilities and aspirations than others (IC15)

- 0.722 Helps me to develop my strengths (IC16)

Knowledge sharing (KS17-KS24)

1. Knowledge donating (KD17-KD20)

- 0.803 Knowledge sharing with colleagues is considered normal outside of my department (KD17)

- 0.800 When I have learned something new regarding the teaching profession, I tell my colleagues in my department about it (KD18)

- 0.816 When they have learned something new, my colleagues within my department tell me about it (KD19)

- 0.800 When they have learned something new, colleagues outside of my department tell me about it (KD20)

2. Knowledge collecting (KC21-KC24)

- 0.846 I share information I have with colleagues within my department when they ask for it (KC21)

- 0.859 I share my skills with colleagues within my department, when they ask for it (KC22)

- 0.860 I share information I have with colleagues outside of my department, when they ask me to (KC23)

- 0.891 Colleagues in my university share information about the teaching profession with me (KC24)

Innovation (IV25-IV32)

1. Product innovation (PD25-PD28)

- 0.837 Our university is delivering new courses for members of staff (PD25)

- 0.796 Our university often develops new teaching materials and methodologies (PD26)

- 0.862 Our university is extending programmes/ services to new groups of employees not previously served by the university (PD27)

- 0.776 Our university often develops new programmes/ services for members of staff and students (PD28)

2. Process innovation (PC29-PC32)

- 0.765 Our university often develops new technology to improve the educational process (PC29)

- 0.800 Our university is trying to input new equipment to facilitate educational operations and work procedures (PC30)

- 0.765 Our university is developing new training programmes for staff member (PC31)

- 0.839 This university is implementing a reward system (i.e. promotions, thank yous--) to encourage members of staff to come up with innovative ideas (PC32).

6.4.2Reliability of the components

Reliability was assessed for the eight factors that resulted from EFA using Cronbach's alpha as shown in Table (23). All values of Cronabach's alpha were above 0.70 as suggested by Hair et al. (2010) and all corrected item total correlations were above 0.35 (Field, 2009), which indicates the internal reliability of the components.

Table 23: Reliability of the results of the EFA

Item	Cronbach's alpha			Cronbah's alpha if item deleted			Corrected item total correlation		
	PU.	PR.	OV.	PU.	PR.	OV.	PU.	PR	OV
Acts in ways that build my respect	0.889	0.880	0.883	0.875	0.881	0.878	0.785	0.805	0.795
Goes beyond self-interest for the good of the group				0.855	0.864	0.860	0.835	0.846	0.840
Emphasises the importance of having a collective sense of mission				0 .887	0.895	0.889	0.750	0.763	0.757
Displays a sense of power and confidence				0.880	0.880	0.882	0.782	0.796	0.779
Talks optimistically about the future regarding teaching operations and administrative issues	0.921	0.910	0.900	0.852	0.804	0.889	0.732	0.758	0.745
Talks enthusiastically about what needs to be accomplished				0.868	0.873	0.870	0.842	0.851	0.846
Expresses confidence that goals will be achieved				0.882	0.886	0.881	0.800	0.814	0.806
Develops a team attitude and spirit among members of staff				0.877	0.891	0.874	0.822	0.808	0.815
Re-examines critical assumptions to question whether they are appropriate	0.886	0.890	0.862	0.882	0.889	0.887	0.744	0.738	0.745
Seeks different perspectives when solving problems				0.876	0.873	0.874	0.837	0.809	0.846
Gets me to look at problems from many different angles				0.874	0.864	0.869	0.840	0.832	0.806
Encourages me to rethink ideas that have never been questioned before				0.890	0 .881	0.884	0.810	0.798	0.815
Spends time teaching and coaching	0.891	0.900	0.888	0.881	0.876	0.887	0.804	0.708	0.741
Treats me as an individual rather than just as a member of a group				0.877	0.875	0.874	0.818	0.811	0.824
Considers me as having different needs, abilities and aspirations than others				0.888	0.888	0.869	0.784	0.772	0.836
Helps me to develop my strengths				0.889	0.886	0.884	0.786	0.783	0.801
When I have learned something new regarding the teaching profession, I tell my colleagues in my department about it	0.832	0.874	0.844	0.891	0.880	0.879	0.797	0.782	0.806
When they have learned something new, my colleagues within my department tell me about it				0.877	0.874	0.876	0.832	0.827	0.815
When they have learned something new, colleagues outside of my department tell me about it				0.889	0.884	0.828	0.794	0.759	0.770

Knowledge sharing with colleagues is considered normal outside of my department				0.890	0.886	0.823	0.790	0.790	0.725
I share information I have with colleagues within my department when they ask for it.	0.854	0.801	0.836	0.882	.885	.811	0.780	0.775	0.789
I share my skills with colleagues within my department, when they ask me to.				0.887	.881	.875	0.798	0.790	0.823
I share information I have with colleagues outside of my department, when they ask me to.				0.876	.872	.884	0.825	0.811	0.795
Colleagues in my university share information about the teaching profession with me.				0.884	.879	.882	0.798	0.790	0.790
Our university is delivering new courses for members of staff	0.861	0.852	0.842	0.883	0.852	0.882	0.780	0.820	0.777
Our university often develops new teaching materials and methodologies				0.882	0.883	0.884	0.734	0.839	0.796
Our university is extending programmes/ services to new groups of employees not previously served by the university.				0.896	0.866	0.874	0.869	0.879	0.818
Our university often develops new programmes/ services for members of staff and students				0.884	0.854	0.881	0.732	0.618	0.797
Our university often develops new technologies to improve the educational process	0.895	0.804	0.873	0.835	0.828	0.945	0.746	0.812	0.676
Our university is trying to input new equipment to facilitate educational operations and work procedures.				0.808	0.876	0.832	0.716	0.687	0.829
Our university is developing new training programmes for staff members				0.867	0.852	0.880	0.768	0.757	0.702
This university is implementing a reward system (i.e. promotions, thank yous--) to encourage members of staff to come up with innovative ideas				0.870	0.850	0.860	0.773	0.777	0.775

Note: PU= public, N=253, PR= private, N= 233, OV= overall data, N= 486

6.4.3 Measurement model

As discussed earlier, there are two steps in SEM: the measurement model and the structural model. The measurement model is used to evaluate the validity of the hypothesised model. The structural model tests the causal relationships among the unobserved variables of the model (Byrne, 2010).

The measurement model specifies the correlations between the factor loadings of the observed variables and the latent variables (Blunch, 2012). The validity of the measurement model depends on:1) establishing acceptable levels of goodness of fit for the model, and 2) finding specific evidence of construct validity (Hair et al., 2010, Blunch, 2012, Schumacker and Lomax, 2012). To evaluate the validity of the measurement model, construct validity, consisting, of convergent and discriminant validity was assessed through CFA using AMOS 20. The convergent validity was tested by investigating the factor loadings, which were deemed significant if they were 0.5 or higher, according to Hair et al. (2010).

According to the EFA discussed in section (6.4.1), eight factors idealised influence, inspirational motivation, intellectual stimulation, individualised consideration, knowledge donating, knowledge collecting, and product, and process innovation were measured using a total of (32) items. The magnitude of the accompanying t-value was assessed as well. Hair et al. (2010) indicated that t-values larger than (1.96) indicate path coefficients that are significant at ($p < 0.05$). On the other hand, Fornell and Larcker (1981) mentioned that measures with high levels of reliability may not exhibit convergent validity if they contain a higher variance of measurement error. Therefore, this study used (AVE) as a complementary measure of convergent validity. According to the latter authors, the value should be more than (0.5) for all constructs. The reliability was assessed separately for each dimension included in the model based on the Cronbach's alpha and (CR) as discussed in Chapter 5. Table (24) shows that for each factor in the public and private universities, each construct has

four items and all the items are significant with the t-values having factor loadings greater than (0.70). For instance, the factor loadings for the public colleges range from (0.727) to (0.893), while the factor loadings for the private colleges range from (0.731) to (0.958).

Table 24: Validity and reliability of the measurement model for public and private colleges

Factors	Code of Item	Standardised Factor Loading		T-Value		α		AVE		CR	
		Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
Idealised influence F1	ID1	0.812	0.808	24.016	15.145	0.880	0.889	0.70	0.73	0.91	0.91
	ID2	0.859	0.856	22.605	16.152						
	ID3	0.833	0.915	26.625	18.152						
	ID4	0.895	0.868	18.594	15.610						
Inspirational motivation F2	IM5	0.729	0.816	22.605	14.981	0.910	0.924	0.73	0.73	0.91	0.93
	IM6	0.840	0.917	22.700	18.122						
	IM7	0.876	0.871	19.272	17.018						
	IM8	0.852	0.852	19.974	15.462						
Intellectual stimulation F3	IS9	0.684	0.787	14.440	14.004	0.890	0.886	0.69	0.71	0.90	0.89
	IS10	0.816	0.860	18.470	16.399						
	IS11	0.882	0.891	24.016	17.272						
	IS12	0.849	0.852	17.167	14.032						
Individualised consideration F4	IC13	0.860	0.871	17.900	15.671	0.900	0.910	0.67	0.71	0.91	0.91
	IC14	0.872	0.870	18.139	15.745						
	IC15	0.820	0.813	16.600	14.262						

	Item											
	IC16	0.737	0.823	28.800	15.680							
Knowledge donating F5	KD17	0.803	0.866	16.389	15.218	0.874	0.832	0.64	0.72	0.88	0.89	
	KD18	0.828	0.892	17.688	16.055							
	KD19	0.790	0.831	15.865	14.618							
	KD20	0.781	0.828	15.912	15.225							
Knowledge collecting F6	KC21	0.836	0.809	15.835	15.024	0.910	0.854	0.75	0.70	0.92	0.88	
	KC22	0.871	0.848	19.116	16.041							
	KC23	0.847	0.819	15.106	15.277							
	KC24	0.840	0.831	16.139	15.033							
Product innovation F7	PD25	0.837	0.980	22.130	44.854	0.899	0.861	0.70	0.73	0.90	0.867	
	PD26	0.806	0.850	15.220	22.141							
	PD27	0.860	0.610	18.510	11.441							
	PD28	0.863	0.968	28.300	44.840							
Process innovation F8	P229	0.775	0.731	13.94	12.558	0.885	0.895	0.63	0.67	0.89	0.90	
	PC30	0.860	0.809	14.88	14.283							
	PC31	0.828	0.883	18.40	16.222							
	PC32	0.813	0.853	15.98	12.558							

Note: α=Cronbach's alpha, AVE = average variance extracted, CR = composite reliability, N= 253 for public, N=233 for private.

Both composite reliability (CR) and the Cronbach's alphas for all factors in both sectors are greater than (0.70). For both sector, the AVE range from (0.63) to (0.75) greater than the 0.50 recommended by Fornell and Larcker (1981), and are greater than the squared inter-construct correlations (see Table 25). Thus, according to these results, the measures utilised in this study demonstrate internal consistency for both public and private sectors.

Table 25: Correlations between the factors and AVEs for public and private colleges

Factors	Public (N=253)							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1.Idealised	**0.70**							
2.Inspirational	0.071	**0.73**						
3.Intellectual	0.061	.064	**0.69**					
4.Individualised	0.081	0.092	0.020	**0.67**				
5.Knowledge donating	0.261	0.272	0.298	0.290	**0.64**			
6.Knowledge collecting	0.255	0.277	0.292	0.285	0.120	**0.75**		
7.Product	0.127	0.170	0.177	0.182	0.322	0.302	**0.70**	
8.Process	0.160	0.182	0.189	0.195	0.345	0.318	0.210	**0.63**
Factors	Private (233)							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1.Idealised	**0.73**							
2.Inspirational	0.069	**0.73**						
3.Intellectual	0.064	0.65	**0.71**					
4.Individualised	0.079	0.088	0.040	**0.71**				
5.Knowledge donating	0.258	0.269	0.290	0.88	**0.72**			
6.Knowledge collecting	0.243	0.263	0.284	0.276	0.115	**0.70**		
7.Product	0.118	0.163	0.154	0.171	0.300	0.299	**0.73**	
8.Process	0.155	0.180	0.178	0.179	0.323	0.310	0.203	**0.67**

6.4.4 Measurement model-first order

The first-order CFA was evaluated to assess the existence of the hypothesised dimensions of the model and to measure the covariance relationships amongst these dimensions that emerged from the EFA. These factors were, for TL: idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration (Bass, 1985), for KS: donating and collecting knowledge (Hooff and Weenen 2004), and for innovation product and process. The hypothesised model for the first-order in both sectors, as shown in Figures 12-13 and Appendix 5, clarifies that the construct of TL in both sectors comprises four factors and each factor contains four items. The KS dimensions in both sectors comprise two factors and each dimension consists of four items. The dimensions of innovation are product and process and each factor includes four items as well.
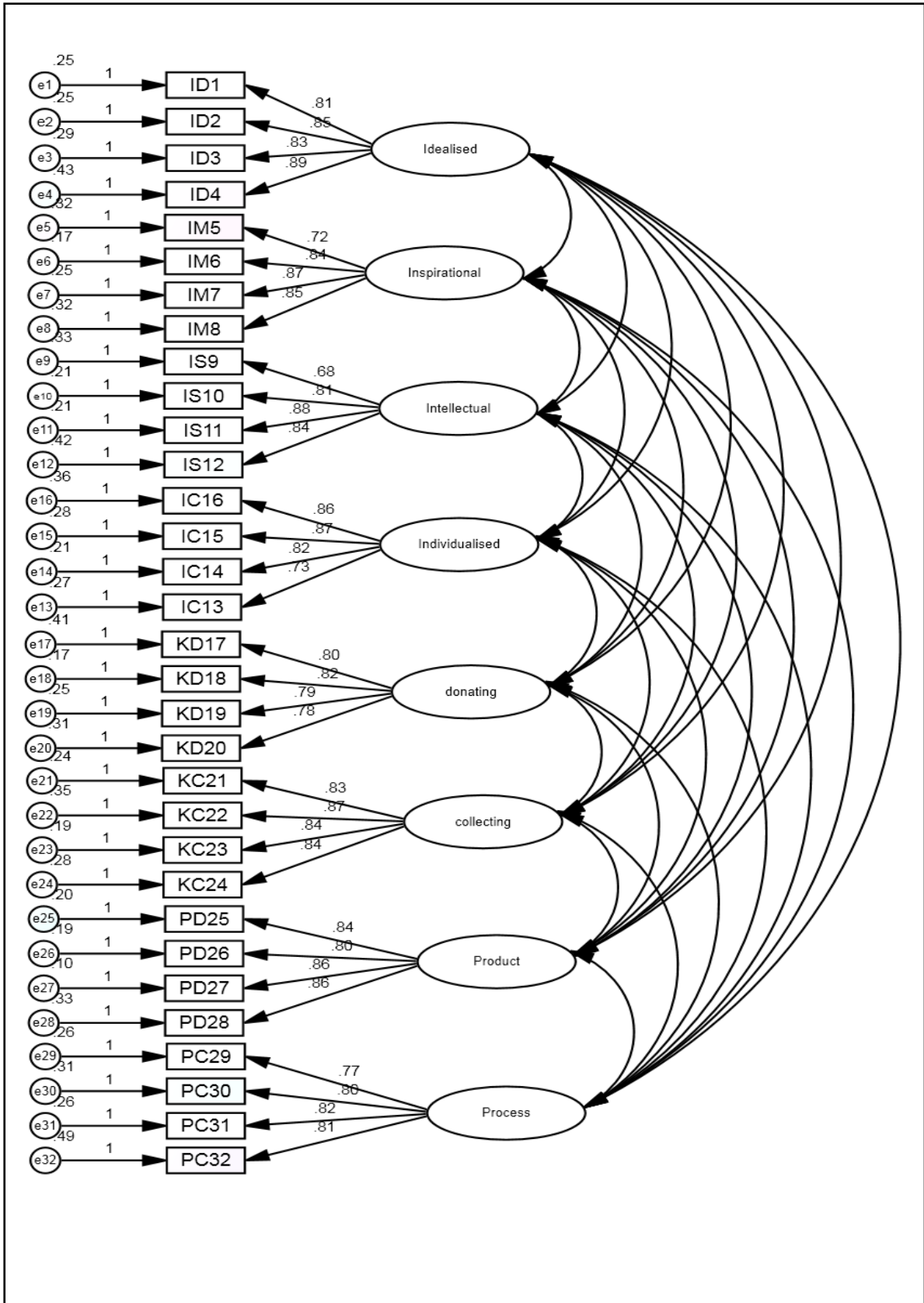
Figure 12: First order of the measurement model for public universities (N=253)

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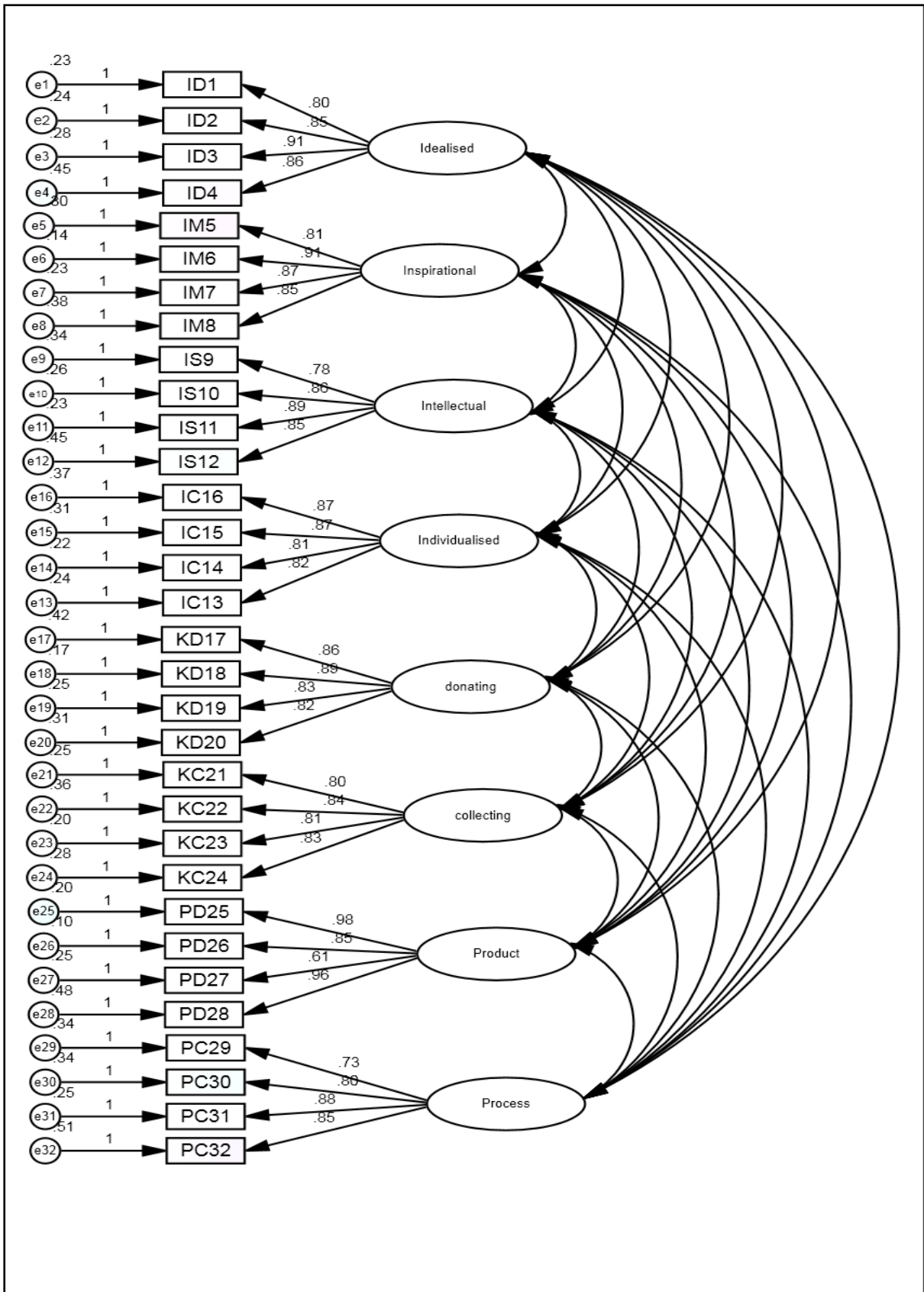
Figure 13: First order of the measurement model for private colleges (N=233)

Table (26) shows the results obtained from the CFA. The values of the TL constructs in the public HEIs are as follows χ²= 166.257, RMSEA = 0.047, NFI= 0.943, CFI= 0.979, TL= 0.976, χ²/df=1.554. For KS they are: χ² = 35.270, df= 22, and χ²/df= 1.603, less than the constructive cut-off level of 2 which suggests a good fit for the measurement model, RMSEA is 0.049, CFI is equal to 0.980, NFI= 0.975, and TLI= 0.987. For innovation the results were CFI = 0.989, TLI= 0.987, χ² =35.519, χ²/df= 1.776, NFI = 0.980 and RMSEA = 0.034. These results indicate that the model fits the sample data for public HEIs.

Table 26: First order of the model in both sectors

Fit indices	Public N= 253			Private N=233			Recommended criteria
	TL	KS	Innovation	TL	KS	Innovation	
Chi-square χ²	166.257	35.270	35.19	147.379	30.994	45.248	P > 0.05
χ²/df	1.554	1.603	1.776	1.459	1.550	1.981	< 2-5
RMSEA	0.047	0.049	0.034	0.044	0.049	0.040	< 0.05-0.08
CFI	0.979	0.980	0.989	0.982	0.991	0.983	≥0.90
NFI	0.943	0.975	0.980	0.945	0.975	0.971	≥ 0.90
TLI	0.976	0.987	0.987	0.979	0.988	0.972	≥ 0.90

In the private colleges, the results from the CFA, as shown in Table (26), are for the TL, χ² = 147.379, gaining 101 degrees of freedom, χ²/ df= 1.459, NFI=0.945, TLI= 0.979, CFI= 0.982, and RMSEA= 0.044. For KS the results were χ² = 30.994, df= 20, χ²/df= 1.550, RMSEA = 0.049, CFI= 0.991, NFI=0.975, and TLI=0.988. The results indicate a good validity for innovation: CFI = 0.983, TLI = 0.972, χ² =45.248 with19 df, χ²/df= 1.981, NFI = 0.971 and

RMSEA = 0.040. These results indicate that the model fits the sample data for the private colleges.

6.4.5 Measurement model second-order

The second-order model, as shown in Figures14 and 15, indicated that all of the four first-order factors load very well into the second-order TL construct, two first-order factors load into the second-order KS construct, and two factors load into the innovation construct, in both sectors.
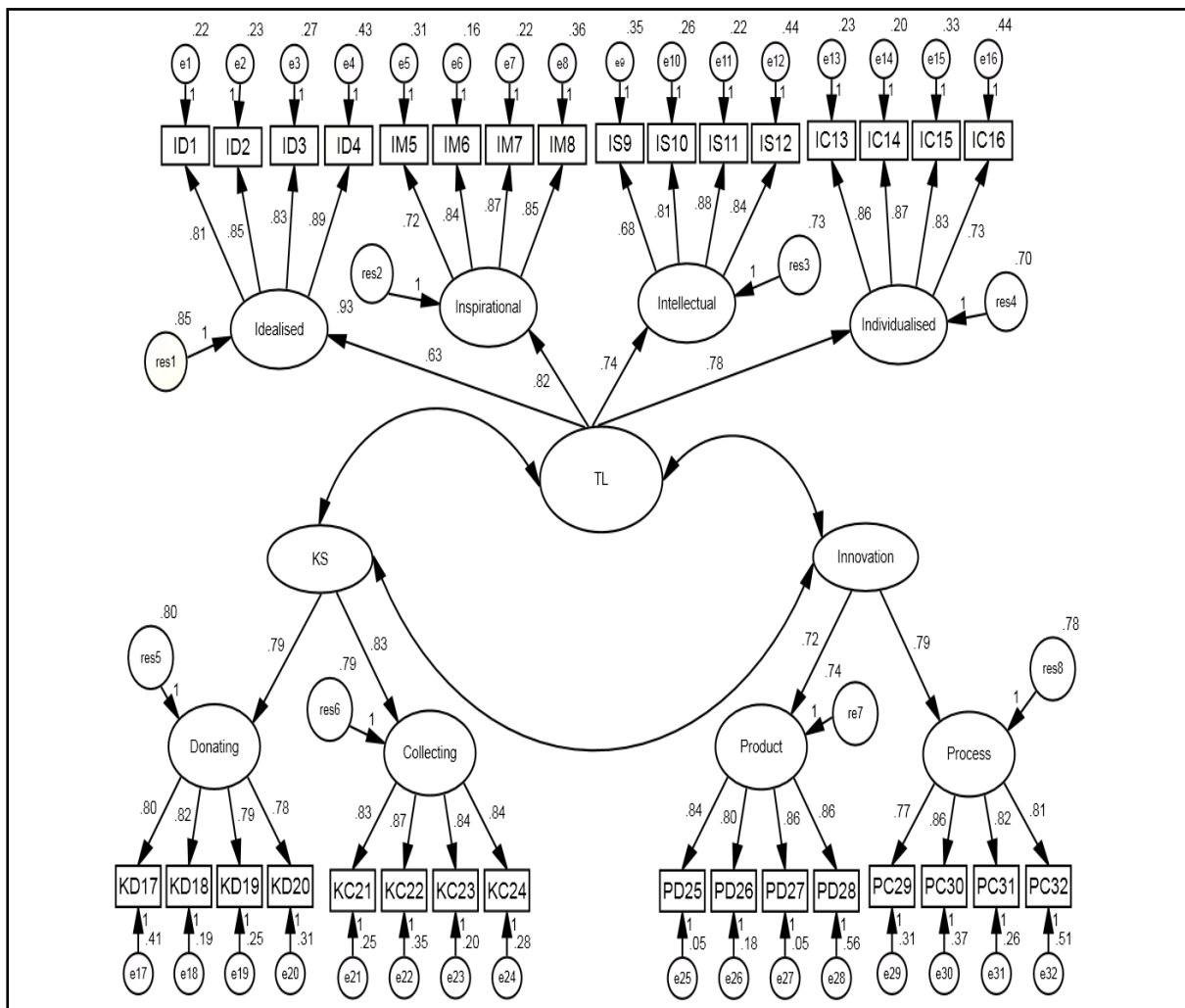
Figure 14: CFA second-order model, public universities (N=253)
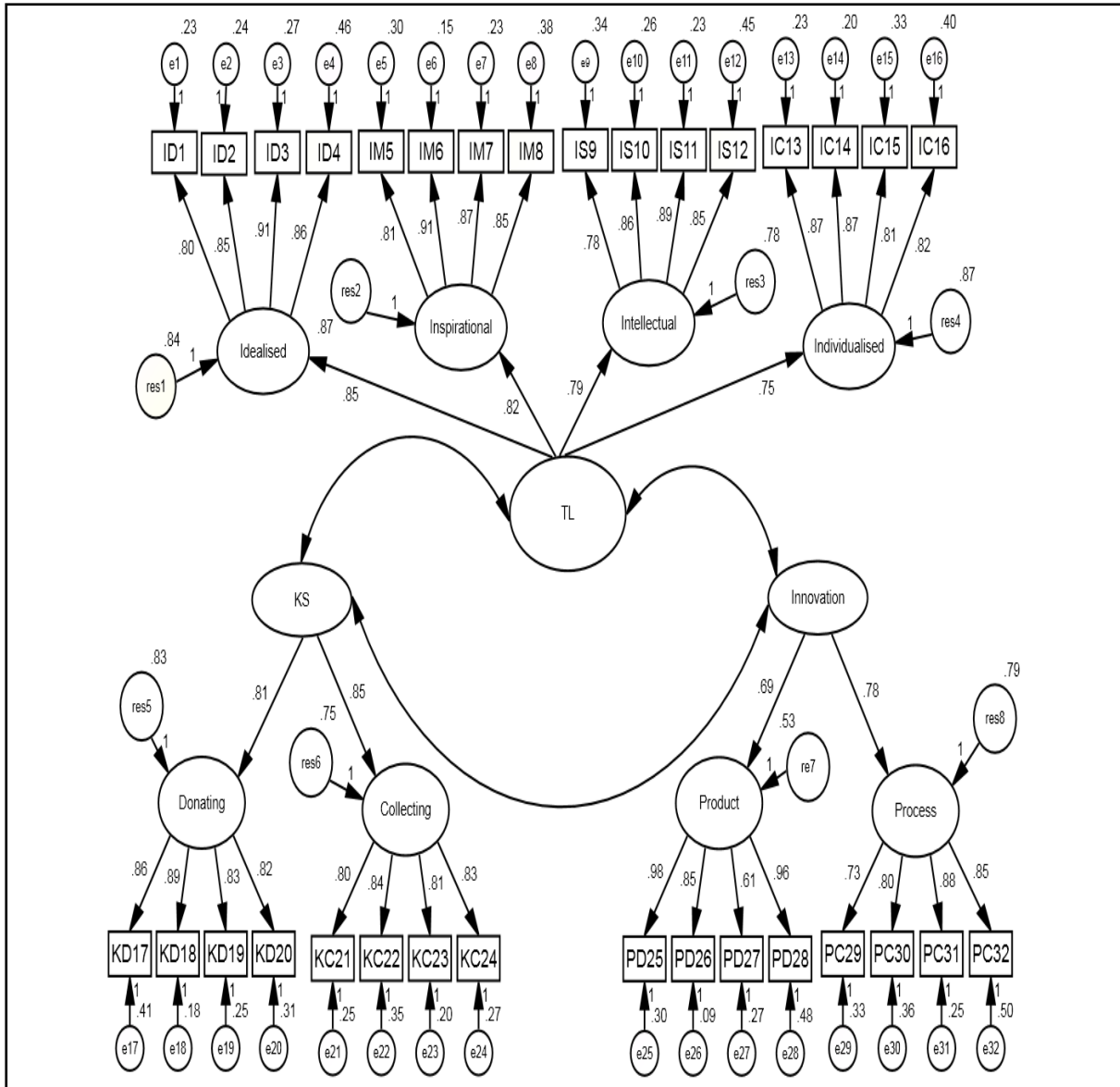
Figure 15: CFA second-order model private colleges (N=233)

Table (27) shows the results from the CFA. For the public colleges, for TL, $\chi^2 = 154.718$, df= 105, χ^2/df =1.474, NFI=0.947, CFI=0.982, TLI= 0.980, and RMSEA= 0.043. For KS: $\chi^2 = 31.190$, χ^2/ df = 1.560, RMSEA = 0.046, NFI= 0.977, CFI= 0.991, and TLI=0.989. The fit indices for innovation were χ^2=26.42, df =18, χ^2/df=1.468, CFI = 0.995, TLI = 0.992, NFI= 0.985, and RMSEA= 0.034.

Table 27: Results of the CFA for the second-order of model

Fit indices	Public N= 253			Private N=233			Recommended criteria
	TL	KS	Innovation	TL	KS	Innovation	
χ^2	154.718	31.190	26.42	145.775	30.926	28.215	p>0.05
χ^2/df	1.474	1.560	1.468	1.429	1.564	1.660	< 2-5
RMSEA	0.043	0.046	0.034	0.050	0.039	0.023	< 0.05-0.08
CFI	0.982	0.991	0.995	0.983	0.989	0.992	≥0.90
NFI	0.947	0.977	0.985	0.946	0.970	0.982	≥ 0.90
TLI	0.980	0.989	0.992	0.977	0.982	0.989	≥ 0.90

For the private sector, the second-order results of the CFA were as follows: For TL, χ^2 = 145.775 with df= 102, χ^2/df=1.429, NFI = 0.946, CFI = 0.982, TLI= 0.977, and RMSEA = 0.050. For KS, χ^2 = 30.926, χ^2/ df = 1.546, RMSEA = 0.039, NFI= 0.970, CFI= 0.989, and TLI= 0.982. For innovation, χ^2= 28.215 with 17 df, χ^2/df= 1.660, CFI = 0.992, NFI = 0.982, RMSEA=0.023, and TLI=0.989.

These results indicate that in both sectors, the 16 items converge into TL and these are divided into four constructs, idealised influence, inspirational motivation, intellectual stimulation and individualised consideration. Eight items converge into a single KS construct as well, which is divided into two factors, donating and collecting. Finally, eight items converge into the innovation construct, which is divided into two factors, product, and process. Therefore, this model is acceptable, and the measurement model has overall validity in both public and private HEIs.

6.5 Measurement invariance across groups (comparative testing)

Multi-group SEM with AMOS 20 was used in this study, as recommended by Byrne (2010), to test the differences in TL practice and the impacts on KS and innovation between public and private Iraqi colleges. This tests for equivalence across the groups. The primary aim here is to explore whether the response characteristics for each item are interpreted similarly across groups (Hair et al., 2010). To test for multi-group equivalence, Schumacker and Lomax (2012) suggested starting from the measurement model to test the structural factors.

Although Hair et al. (2010) suggested six steps of measurement equivalence in comparison studies, namely configural invariance, metric invariance, scalar invariance, factor convariance, factor variance, and error variance invariance, it was felt that questions and hypotheses in this study could be tested with configural invariance and metric invariance only. Thus, the first step in the multi-group CFA comparison was to determine a baseline model (configural invariance) by combining the two groups (public and private samples). Configural invariance refers to the equality of the factor structures for the theoretical model across groups. According to this step, the data for the public and private universities in Iraq was combined so as to create a baseline model and then the differences in the hypothesised relationships in the theoretical model were tested using multi-group CFA with AMOS 20.

To evaluate the configural invariance, the goodness-of-fit indices were used, as reported in the literature (Hair et al., 2010, Blunch, 2012, Schumacker and Lomax, 2012, Kline, 2005, Tabachnick and Fidell, 2007), across the sample groups.

The next step was a metric invariance. This step assesses whether the factor loadings for each scale indicator are identical or equivalent across group (Schumacker and Lomax, 2012). To test the metric invariance of the factors in the baseline model (first step), the model was constrained to be equal between groups.

To evaluate the metric invariance for the constructs across groups, the chi-squared (χ^2) value was used to compare between the unconstrained model (configural model-step 1) and the constrained equal model (step 2). A non-significant χ^2 value at $p < 0.05$ for the differences between the two models shows that the model has measurement equivalence across groups because changes in the χ^2 values are sensitive to the sample size (Byrne, 2010).

6.5.1 Baseline model

After combining the two-group EFA analysis for the whole sample conducted, the model consisted of eight factors. The same procedure was used in the single group to evaluate reliability and convergent validity. To test measurement invariance, the study combined the two groups (N=486). As Table (28) shows, there is an acceptable fit, with, χ^2=1219.396, df = 911, χ^2/df= 1339, NFI=0.901, CFI = 0.973, TLI=0.970, and RMSEA= 0.027. These results indicate that configural invariance is attained.

Metric invariance was tested by constraining the factor pattern coefficients to be equal. This step increased the χ^2 value from 1219.396 to 1222.439 with df = 920. Since the metric invariance (step 2) is nested within the configural invariance (step1), the χ^2 value differences equal 3.043 with 9 df, which is not-significant at 0.05. Thus, metric invariance was supported across the public and private colleges in Iraq.

Table 28: Measurement invariance for multiple-group model (unconstrained and constrained models)

Model	χ^2	Δ χ^2	df	Δ df	χ^2/df	CFI	NFI	TLI	RMSEA
Unconstrained configural invariance	1219.396	-	911	-	1.339	0.973	0.901	0.970	0.027
Constrained: metric + invariance	1222.439	3.043	920	9	1.328	0.975	0.900	0.974	0.025

Furthermore, the internal consistency and construct validity of the whole model as shown in Tables (29) and (30), were acceptable. The factor loadings for the constructs are greater than 0.5, as suggested by Hair et al. (2010). The AVE values are good at greater than 0.5 and are

greater than the squared inter-construct correlations (see Table 29). Composite reliability (CR) and the Cronbach's alphas are also good, being greater than 0.70 (Fornell and Larcker, 1981). These results indicate that the configural invariance is identical for the public and the private sample.

Table 29: Reliability and validity of the multi-group model

Factors	Code of item	Standardised factor loading	T-value	Cronbach's alpha	AVE	CR
Idealised influence (F1)	ID1	0.795	12.791	0.88	0.70	.089
	ID2	0.828	15.707			
	ID3	0.898	17.533			
	ID4	0.820	14.791			
Inspirational motivation (F2)	IM5	0.774	15.390	0.90	0.71	0.91
	IM6	0.890	19.869			
	IM7	0.853	18.337			
	IM8	0.868	17.024			
Intellectual stimulation (F3)	IS9	0.779	14.874	0.86	0.74	0.88
	IS10	0.888	18.419			
	IS11	0.897	18.705			
	IS12	0.856	14.875			
Individualised consideration (F4)	IC13	0.862	17.544	0.88	0.72	0.91
	IC14	0.878	18.077			
	IC15	0.827	16.388			
	IC16	0.827	17.255			
Knowledge donating (F5)	KD17	0.851	16.291	0.84	0.72	0.87
	KD18	0.893	18.034			
	KD19	0.833	16.240			
	KD20	0.835	16.291			
Knowledge collecting (F6)	KC21	0.832	15.965	0.82	0.72	0.86
	KC22	0.882	16.972			
	KC23	0.843	15.935			
	KC24	0.844	15.965			
Product innovation (F7)	PD25	0.780	14.825	.0.84	0.60	0.86
	PD26	0.790	19764			
	PD27	0.686	14.718			
	PD28	0.857	20.811			
Process innovation (F8)	PC29	0.766	14.048	0.86	0.69	0.90
	PC30	0.800	14.260			
	PC31	0.917	22.272			
	PC32	0.840	14.048			

Notes: Extraction method: principal component analysis; rotation method: varimax with Kaiser normalisation, AVE = average variance extracted, CR = composite reliability, N= 486

Table 30: Correlation between factors and AVEs for multi-group sample

Factors	1	2	3	4	5	6	7	8
1-Idealised influence	**0.70**							
2-Inspirational motivation	0.068	**0.71**						
3- Intellectual stimulation	0.120	0.194	**0.74**					
4-Individualised consideration	0.132	0.114	0.195	**0.72**				
5-Knowledge donating	0.342	0.357	0.382	0.316	**0.72**			
6- Knowledge collecting	0.374	0.352	0.316	0.334	0.216	**0.72**		
7- Product innovation	0.281	0.225	0.229	0.329	0.310	0.380	**0.69**	
8- Process innovation	0.311	0.270	0.297	0.320	0.386	0.385	0.107	**0.63**

6.5.2 Measurement model-first and second order (multi-group confirmatory factor analysis (MCFA)

The first and second-order models were evaluated using MCFA, combining two samples (public and private sectors) so as to assess the existence of the hypothesised dimensions of the whole model, namely idealised influence, inspirational motivation, intellectual stimulation and individualised consideration for TL (Bass, 1985). Donating and collecting for KS (Hooff and Weenen 2004), and product and process for innovation (see Figure 16-17 and Appendix 5).
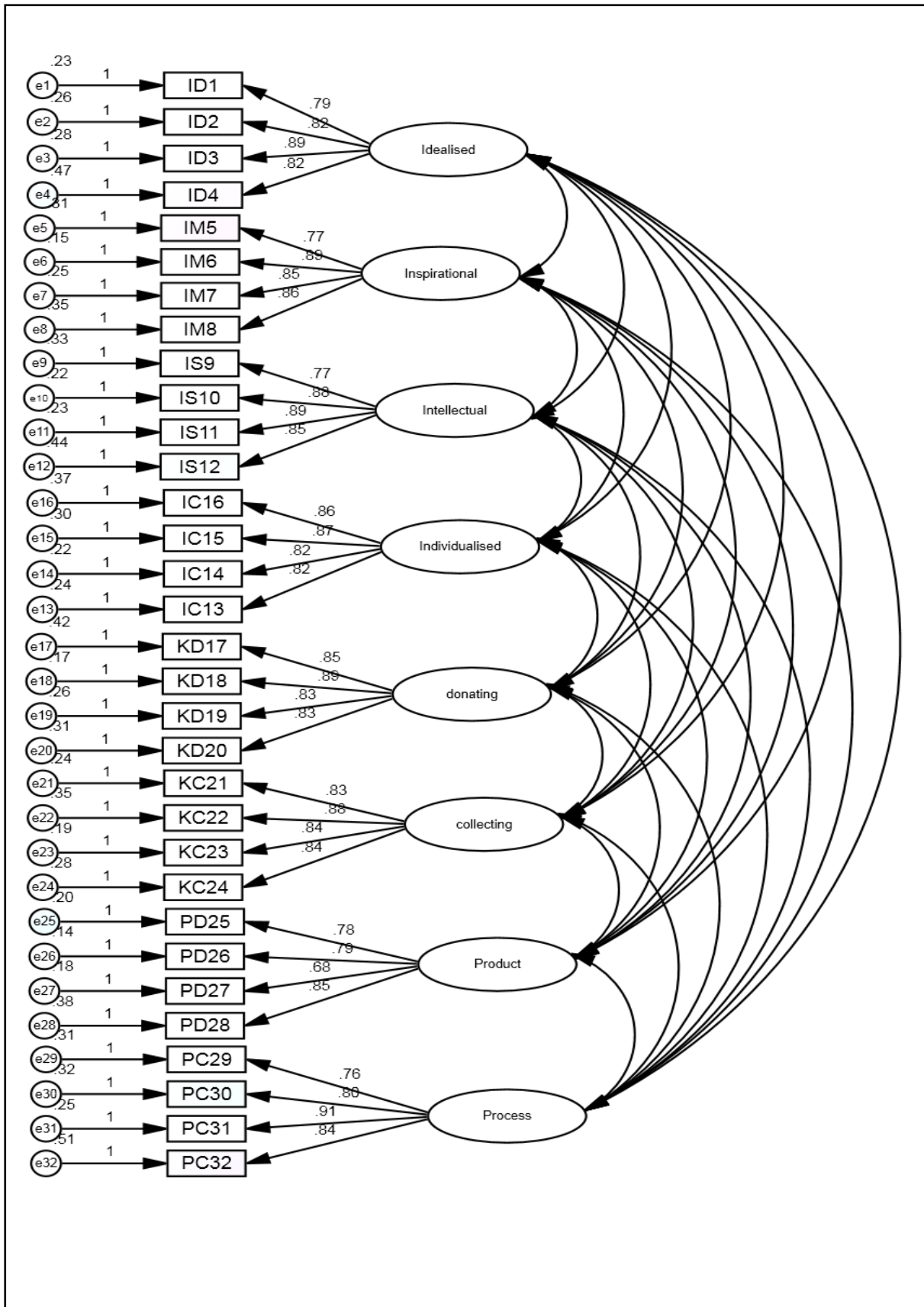
Figure 16: MCFA first order of the model (N=486)

The absolute fit indices for the first order are reported in Table (31). The values for the construct TL are (χ^2) = 289.425, df = 200, χ^2/df = 1.447, NFI=0.948, CFI=0.983, TLI= 0.980, and RMSEA=0.051. The global fit indices of KS displayed a very good fit: χ^2 = 71.375, df= 42, χ^2/df= 1.699, less than the constructive cut-off level of 2, which suggests a good fit for the measurement model, RMSEA = 0.038, CFI = 0.989, NFI = 0.973, and TLI= 0.985, indicating a good fit for the particular model characteristics. For innovation: CFI = 0.992, TLI= 0.989, χ^2 =63.148, NFI = 0.981 and RMSEA = 0.037. All coefficients were significant, which indicated good validity and showed that the model fit the sample data across groups.

Table 31: Results of MCFA for the first and second order of the model

Fit indices	Multi-group-first order N= 486			Multi-group-second order N=486			Recommended criteria
	TL	KS	Innovation	TL	KS	Innovation	
Chi-square χ^2	289.425	71.375	63.148	295.486	61.931	29.340	P > 0.05
χ^2/df	1.447	1.699	1.662	1.441	1.630	1.834	≤ 2- 5
RMSEA	0.051	0.038	0.037	0.032	0.036	0.041	< 0.05 – 0.08
CFI	0.983	0.989	0.992	0.983	0.994	0.983	≥0.90
NFI	0.948	0.973	0.981	0.949	0.979	0.951	≥ 0.90
TLI	0.980	0.985	0.989	0.983	0.987	0.942	≥ 0.90

For the second order, it is obvious from Table 31 that all the fit indices are significant and within the target values, and the three constructs of the study are well represented in the model.
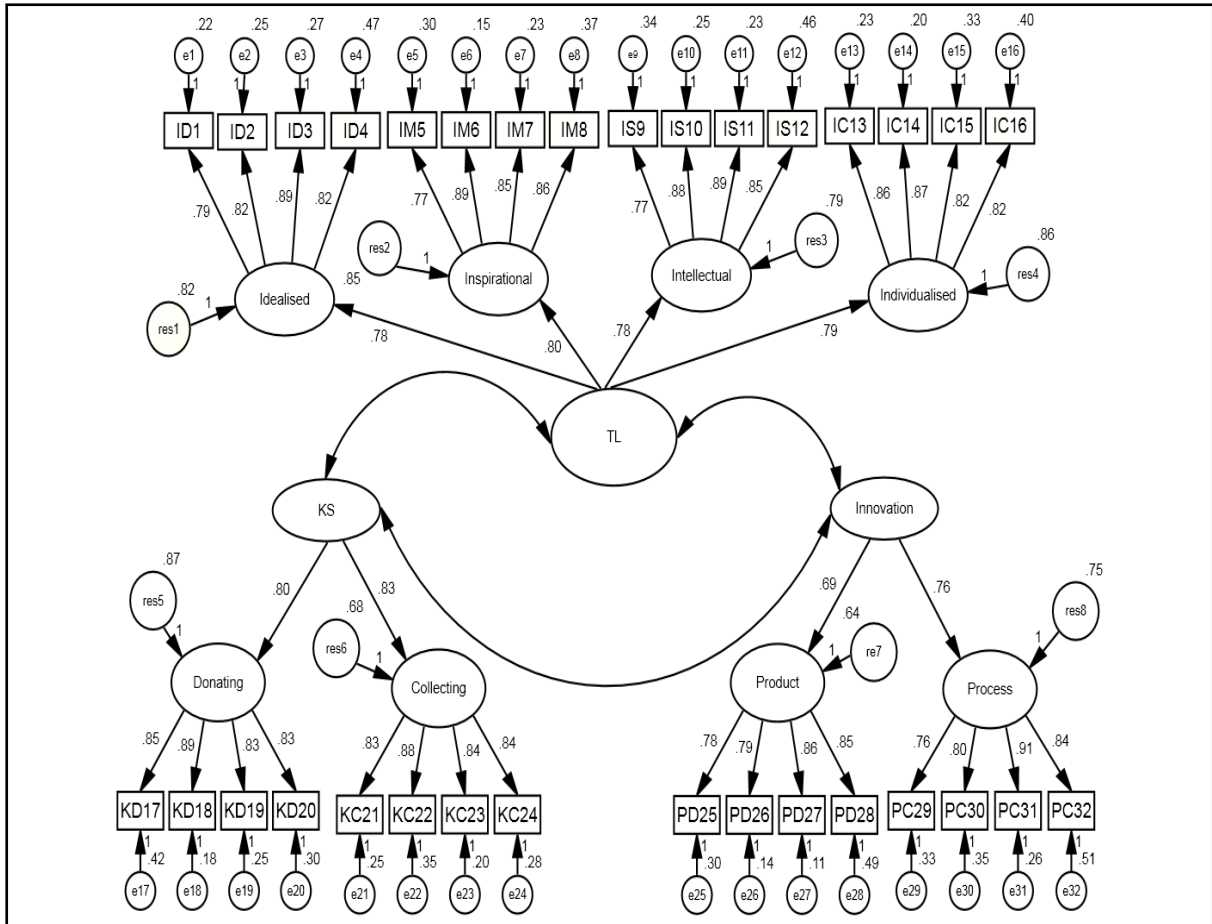
Figure 17: MCFA, second order of the model (N=486)

6.6 Structural model and testing of hypotheses

SEM generates both a measurement model and a structural model (Byrne, 2010). In the previous sections, the measurement model was established for the three constructs: TL, KS and innovation, in both sectors in addition to the multi-group CFA. In this section, the structural model will be used to investigate the strength and direction of the causal relationships between the constructs by testing the study's hypotheses.

Hypotheses H1 (a-h), and H2 (a-d) posited the direct effect of TL on innovation and KS, while H3 (a-b) posited the direct effect of KS on innovation, in public and private colleges. These hypotheses were tested using SEM with AMOS 20. Firstly, it was determined that the hypothesised model had a good fit for both sectors. Then, the focus turned to the path

coefficients and their associated t-values, which had to be (1.96) or greater in order for the coefficients to be considered significant at p<0.05, thus, supporting or rejecting the hypotheses

According to the results from AMOS for the structural model, the structural model fits the data and all fit indices lie within the recommended criteria, for both sectors. In the public colleges, the model fit indices for the direct effect of TL on innovation are χ^2 = 427.270 with df= 250 and χ^2/df = 1.709, NFI = 0.911, CFI = 0.961, TLI = 0.923, and RMSEA = 0.053. For the private colleges, they are χ^2 = 436.358 with df= 255 and χ^2/df = 1.711, NFI = 0.901, CFI = 0.956, and RMSEA = 0.050.

H1 is concerned with the effect of TL (idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration) on innovation (product and process). Table 32 shows an overall effect of TL on innovation is (0.213) for *H1* in public HEIs. The overall effect on product innovation is (0.235) with sub-effects of (0.189 (ID), 0.223 (IM), 0.243 (IS), 0.265 (IC)). The overall effect of TL on process innovation was (0.252) with sub-effects of (0.195 (ID), 0.261 (IM), 0.265 (IS), and 0.292 (IC)) for process

In the private sector the overall effect of TL on innovation is (0.197) for *H1*. The overall effect of TL on product is (0.187) with sub-effects of (0.158 (ID), 0.247(IM), 0.165 (IS), 0.178 (IC)), and (0.208) with sub-effects (0.143 (ID), 0.279 (IM), 257 (IS), and 0.154 (IC)) for process are significant at p<0.05. Therefore, *H1* is fully supported in both sectors (see Figures 18-21).
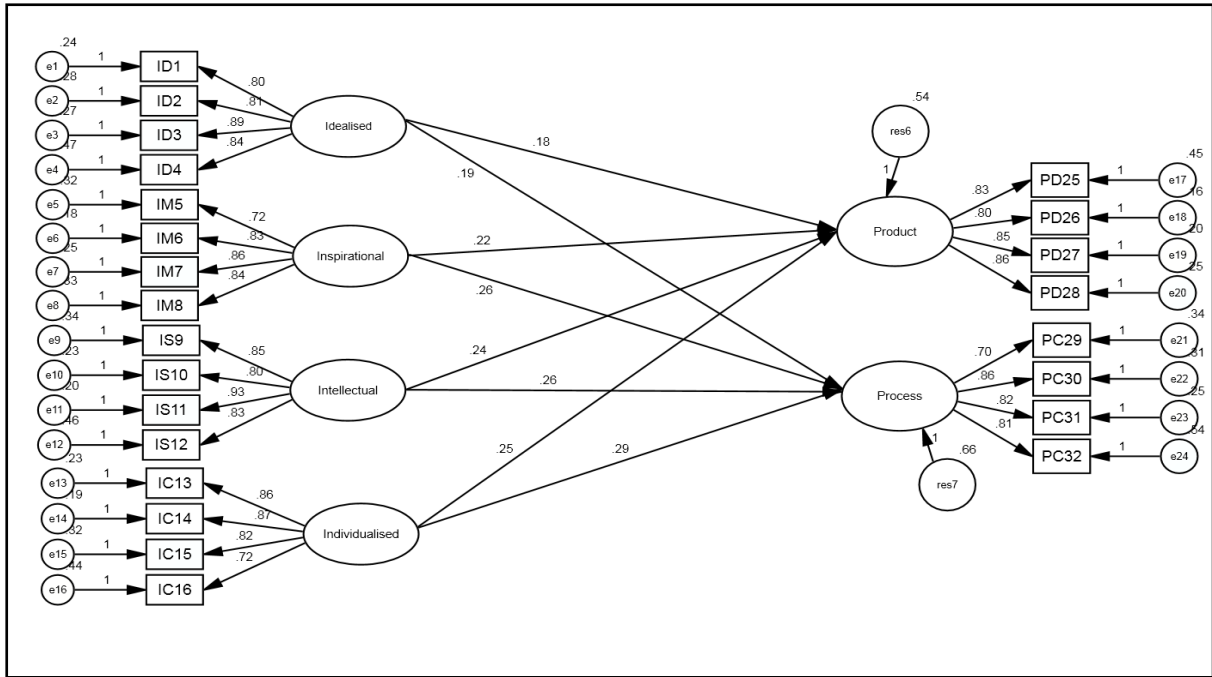
Figure 18: Structural model of the direct effect of the four components of TL on product and process innovation in public HEIS
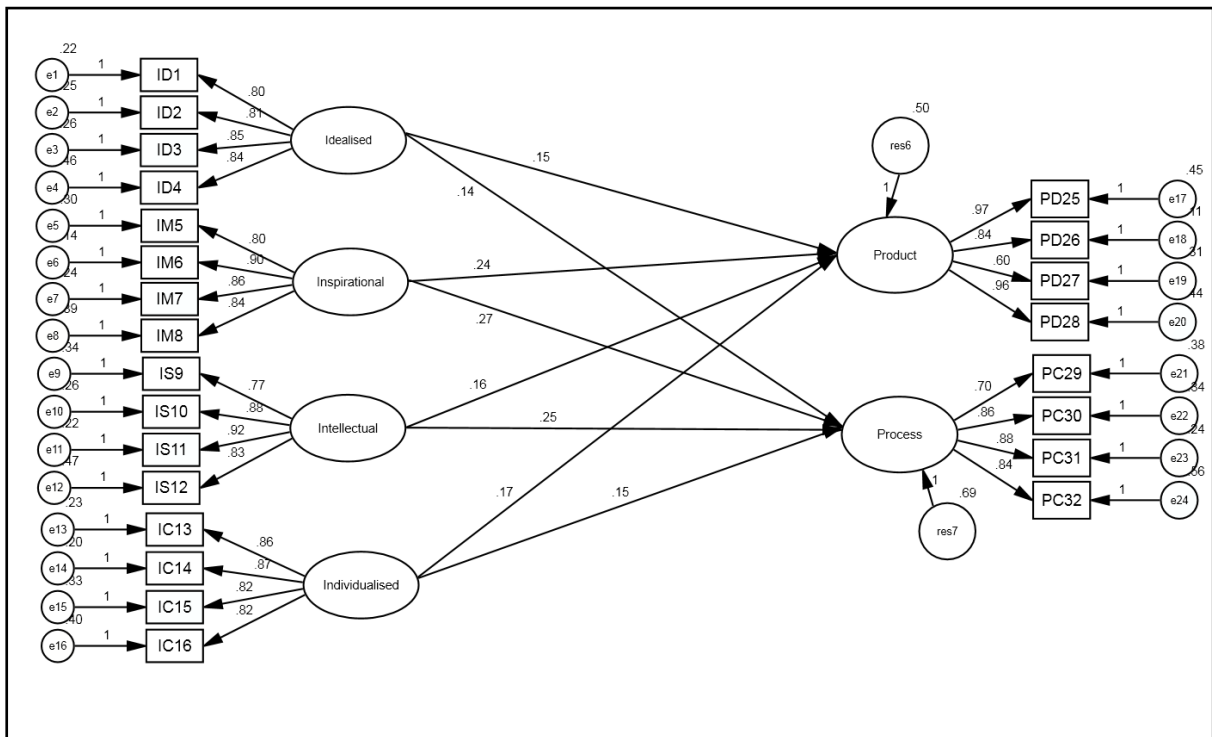
Figure 19: Structural model of the direct effect of the four components of TL on product and process innovation in private colleges
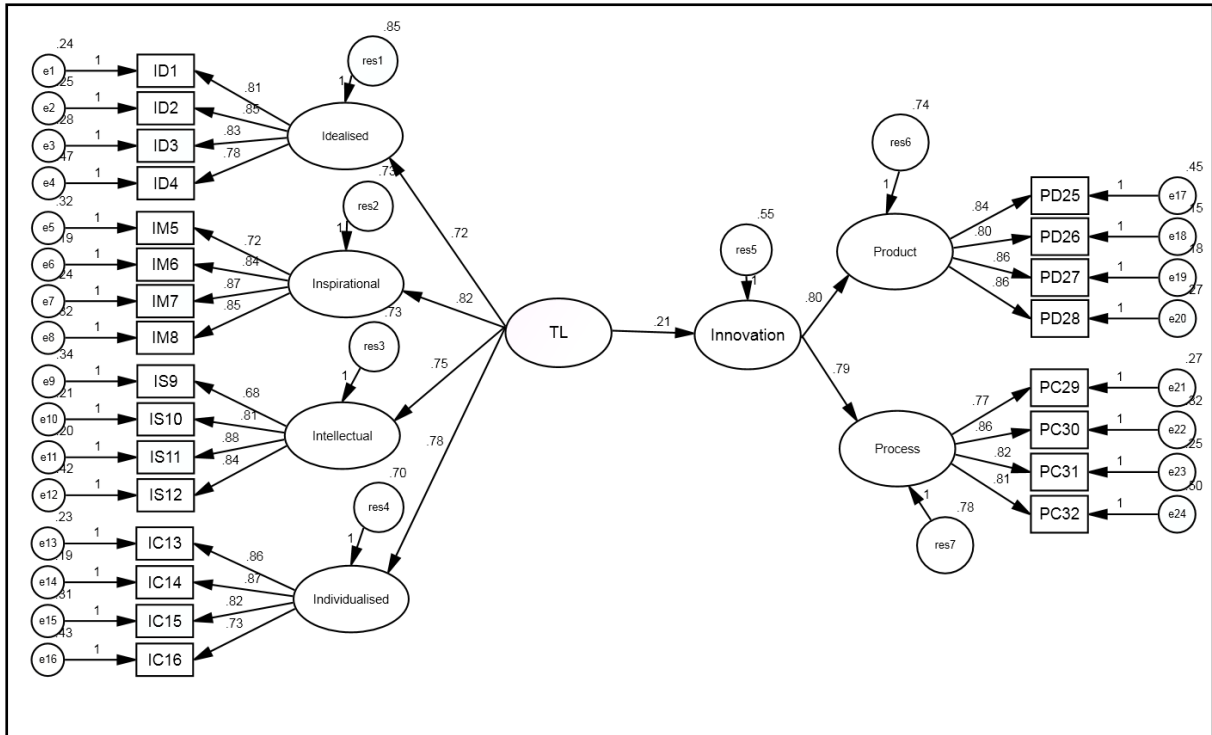
Figure 20: Direct effect of TL on innovation in public HEIs
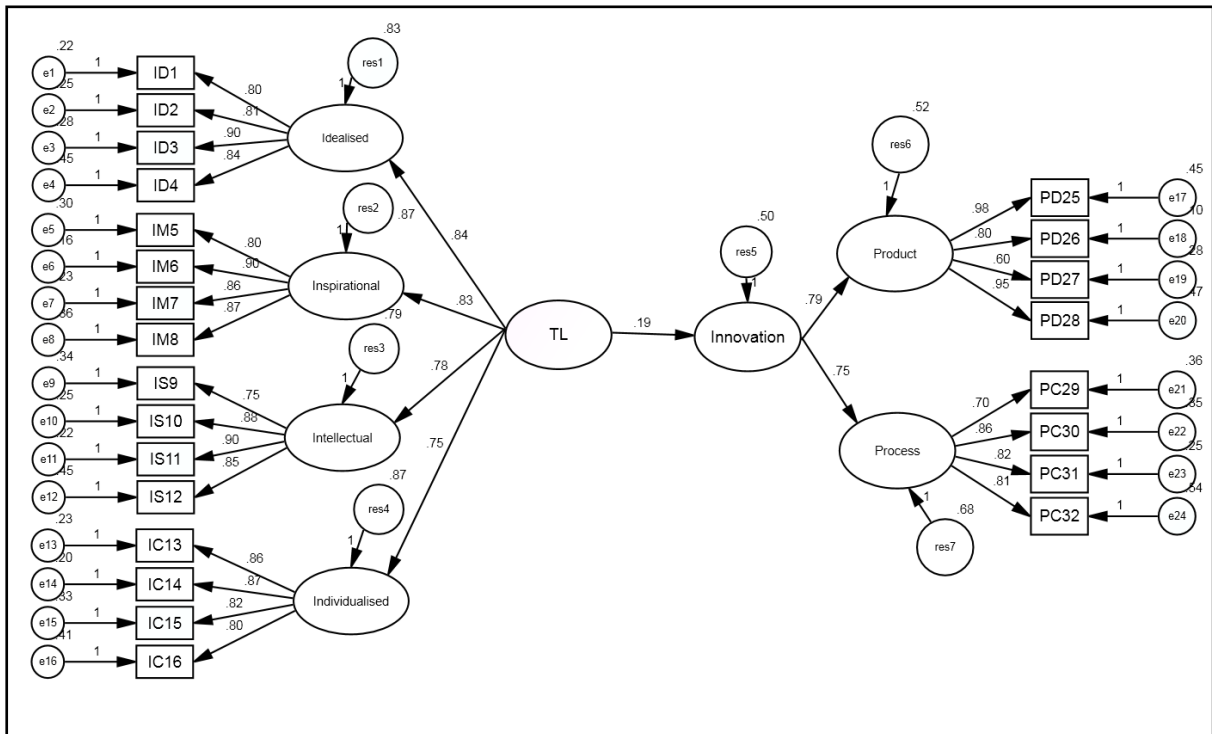
Figure 21: Direct effect of TL on innovation in private colleges

The results showed a good fit to the data for the direct effect of TL on KS in both sectors. The fit indices for the structural model in the public sector are χ^2 = 338.92 with df 252, χ^2/df = 1.345, CFI = 0.979, NFI = 0.924, and RMSEA 0.037.

In the private sector, χ^2 = 381.218, χ^2/df = 1.519, which is less than the upper limit of 2 recommended by Hair et al. (2010) indicating a good fit, CFI = 0.966, NFI = 0.907, and RMSEA = 0.046 (see Figures 22-25).
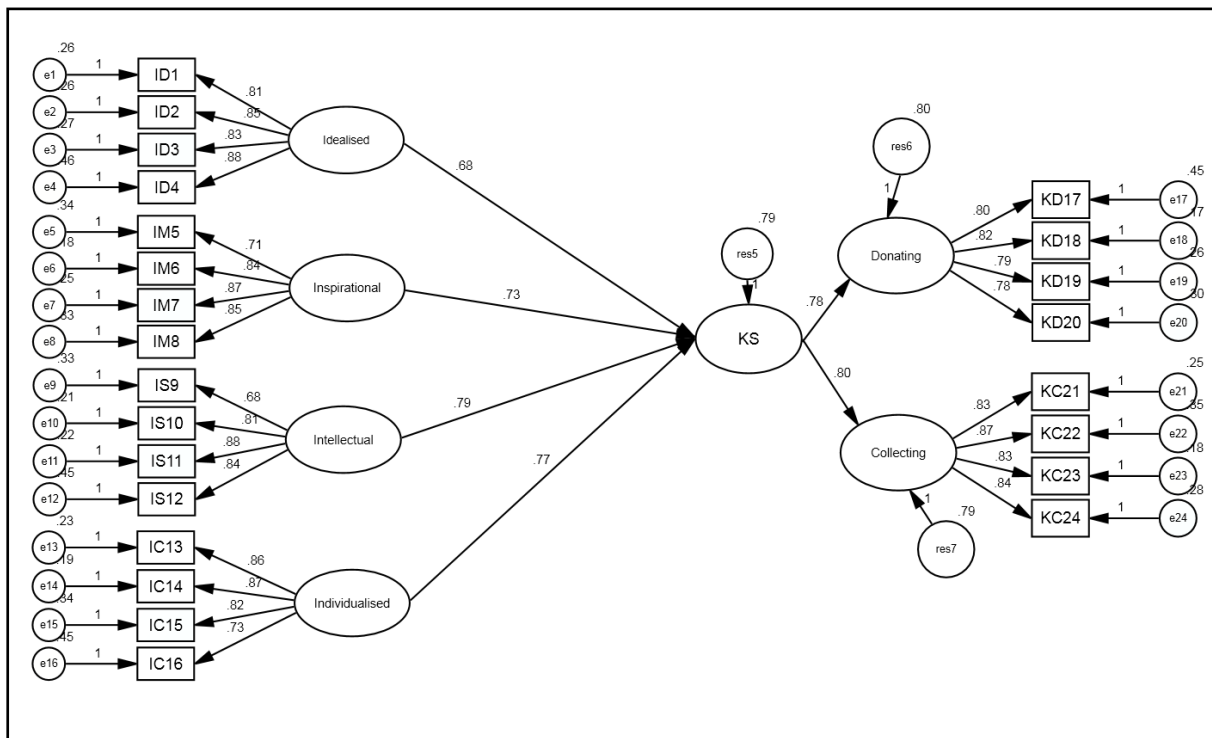
Figure 22: Direct effects of the four components of TL on KS in public HEIs
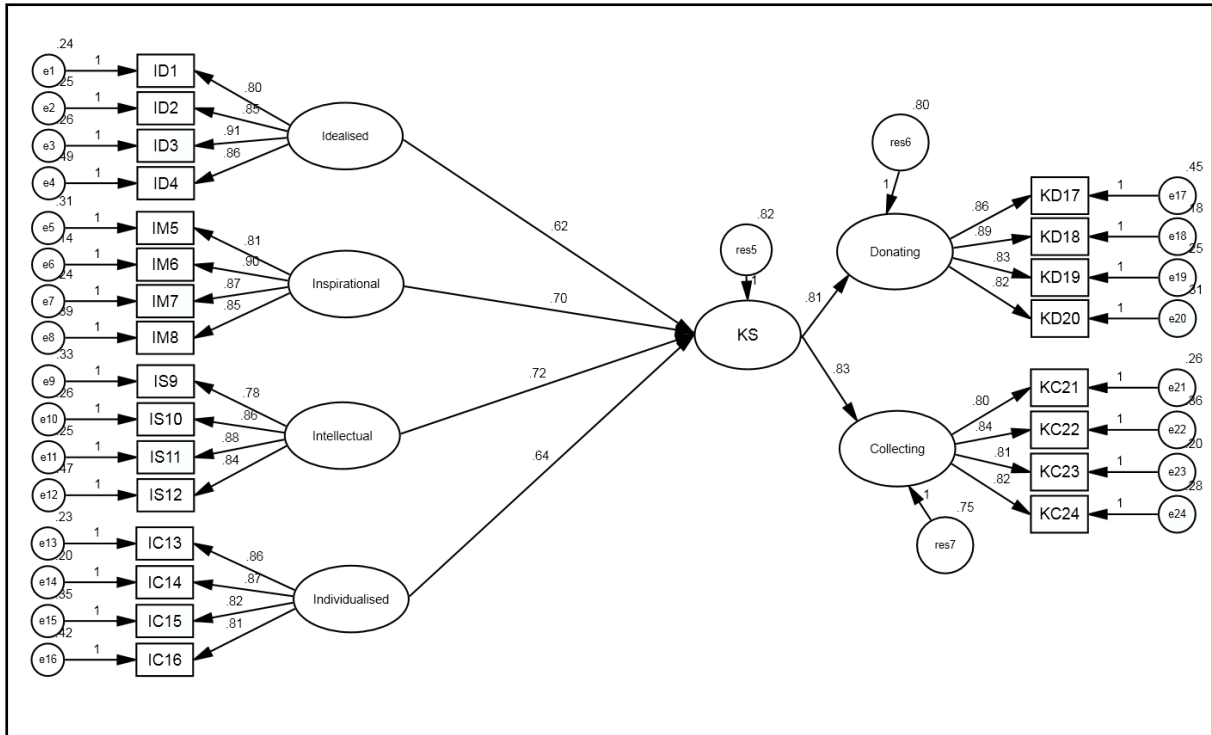
Figure 23: Direct effects of the four components of TL on KS in private colleges

Table 32 shows an effect size of TL on KS is (0.730) with (sub-effects 0.680 (ID), 0.734 (IM), 0.790 (IS), and 0.778 (IC)), statistically significant with $p < 0.05$, in the public colleges, and the effect size of TL on KS is (0.671) with sub-effects (0.621 (ID), 0.699 (IM), 0.720 (IS), and 0.645 (IC)) in the private sector, also significant at $p < 0.05$, providing support for *H2a-d*.
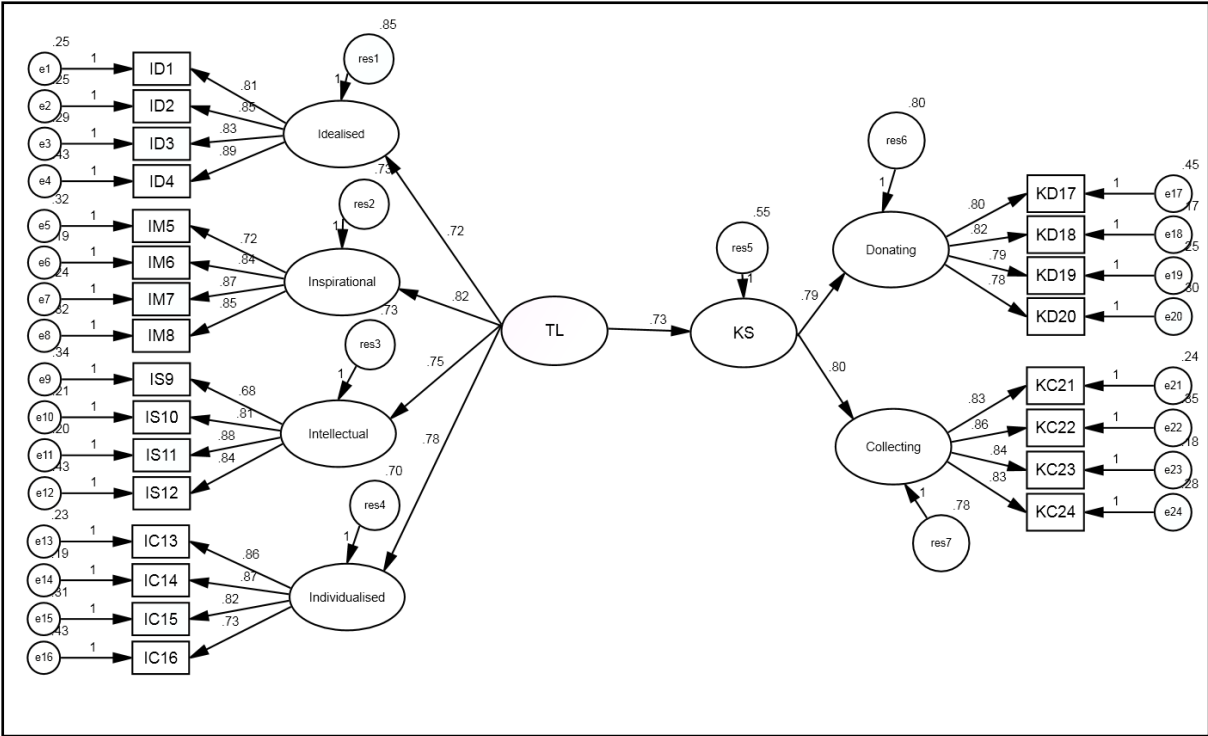
Figure 24: Direct effect of TL on KS in public HEIs
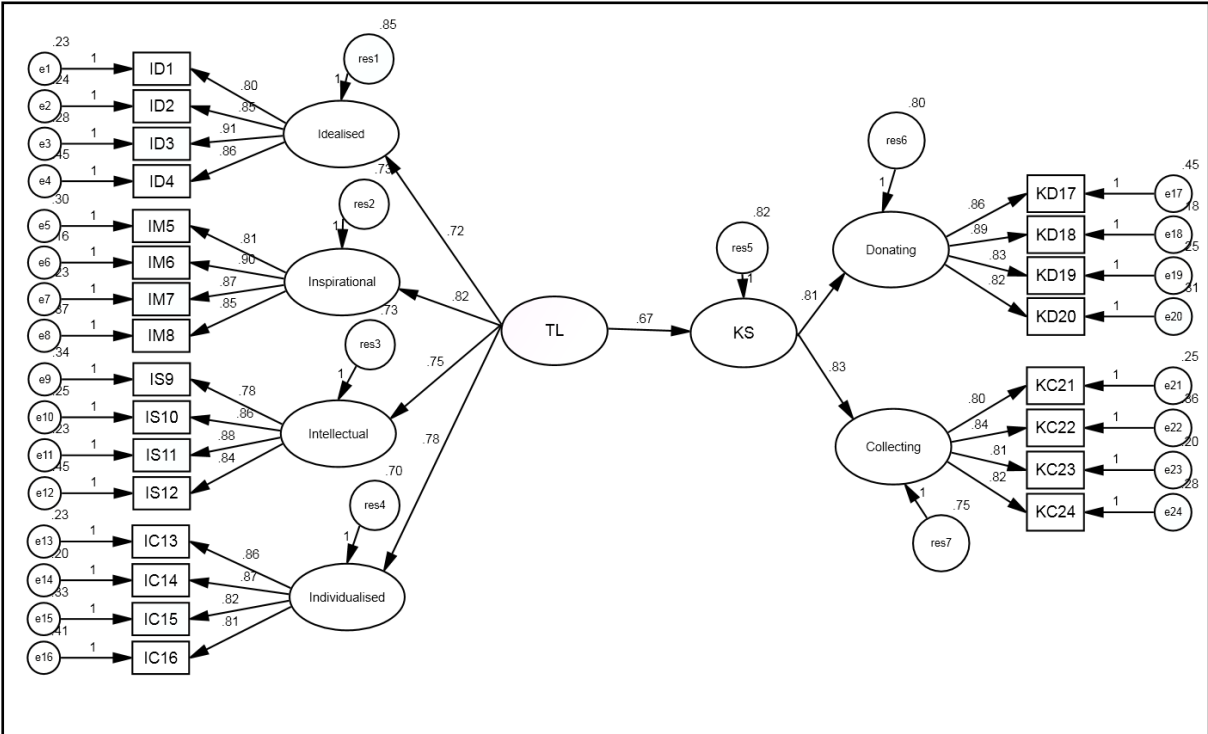
Figure 25: Direct effect of TL on KS in private colleges

Table 32: Results for the direct effects in the model, based on AMOS analysis

Hypothesis		Hypothesis path	Public		Private	
			Estimate	CR	Estimate	CR
H1	H1a	Idealised → Product	0.189*	2.983	0.158*	2.985
	H1b	Inspirational → Product	0.223*	2.988	0.247*	3.230
	H1c	Intellectual → Product	0.243*	3.654	0.165*	2.170
	H1d	Individualised → Product	0.256**	3.664	0.178*	2.759
	H1a-d	**TL → Product**	**0.235***	3.160	**0.187***	2.310
	H1e	Idealised → Process	0.195*	2.066	0.143**	2.052
	H1f	Inspirational → Process	0.261**	3.418	0.279**	3.682
	H1g	Intellectual → Process	0.265**	3.781	0.257*	2.328
	H1h	Individualised → Process	0.292**	3.933	0.154*	2.588
	H1e-h	**TL → Process**	**0.252***	3.542	**0.208***	3.230
	H1a-h	**TL → Innovation**	**0.213***	3.682	**0.197***	3.235
H2	H2a	Idealised → KS	0.680***	11.400	0.621***	13.982
	H2b	Inspirational → KS	0.734***	14.810	0.699***	14.572
	H2c	Intellectual → KS	0.790***	10.784	0.720***	15.589
	H2d	Individualised → KS	0.778**	15.841	0.645**	13.948
	H2a-d	**TL → KS**	**0.730****	14.804	**0.671****	14.900
H3	H3a	KS → Product	0.776**	23.751	0.590*	12.926
	H3b	KS → Process	0.780***	23.768	0.708**	23.502
	H3a-b	**KS → Innovation**	**0.729****	12.928	**0.648****	12.933

Note: p*<0.05, p**< 0.01, p***< 0.001

Regarding the direct effect of KS on innovation, the results from AMOS showed good fit indices in both sectors. For the public colleges, $\chi^2 = 137.661$ with df= 102, $\chi^2/df = 1.350$, RMSEA=0.037, NFI=0.958, CFI = 0.989 and TLI = 0.987.

For the private colleges, χ^2 = 183.382 with df= 102, χ^2/df = 1.798, RMSEA= 0.050, NFI = 0.937, which indicates a good fit, CFI = 0.971 and TLI = 0.966 (see Figures 26-29).
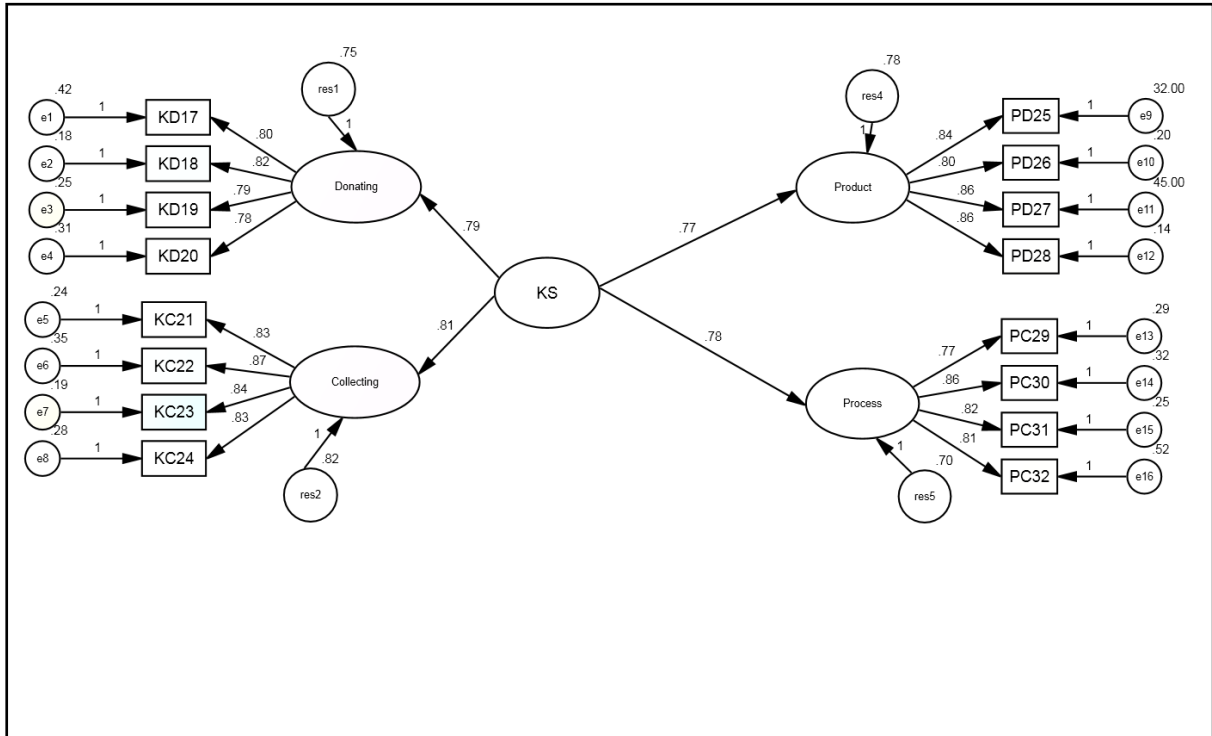
Figure 26: Direct effects of KS on product and process innovation in public HEIs
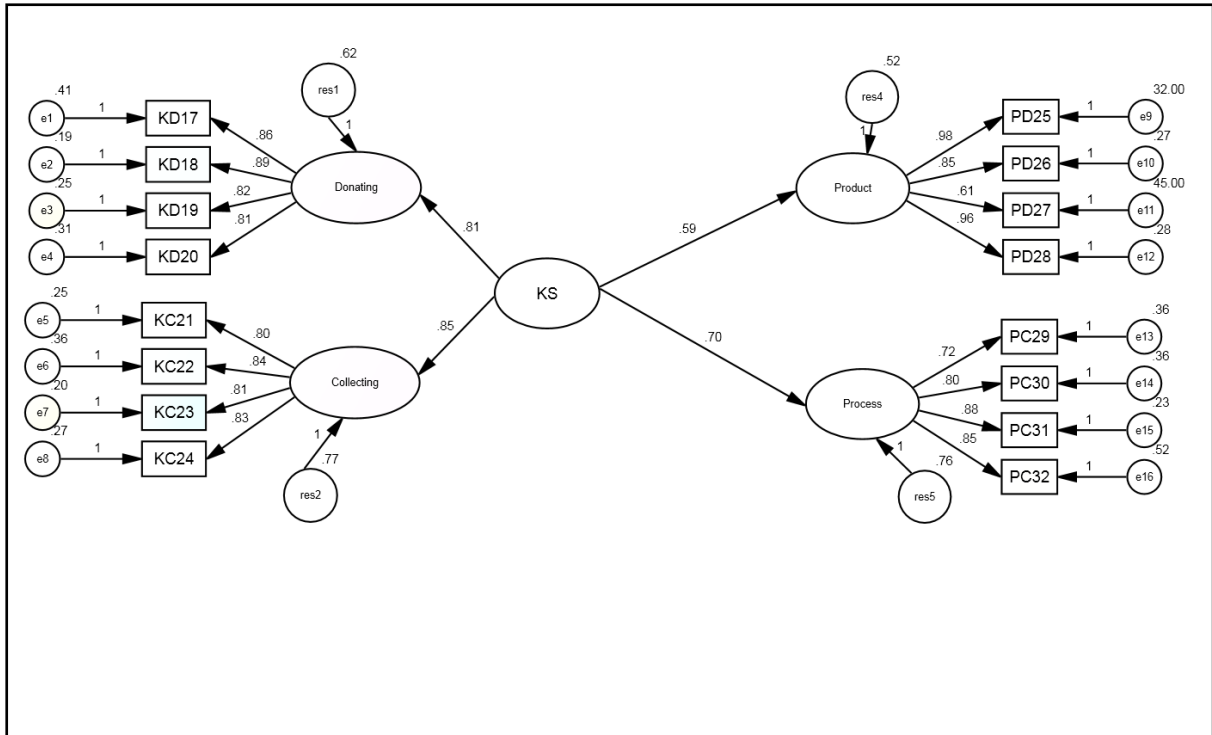
Figure 27: Direct effects of KS on product and process innovation in private colleges

Table (32) shows an effect size of KS on innovation is (0.729) with (sub-effects 0.776 (product), and 0.780 (process)) for public and the overall of KS on innovation is (0.648) with sub-effect (0.590 (product), and 0.708 (process)) for private colleges, significant at $p<0.05$ in both sectors, providing support for *H3*.
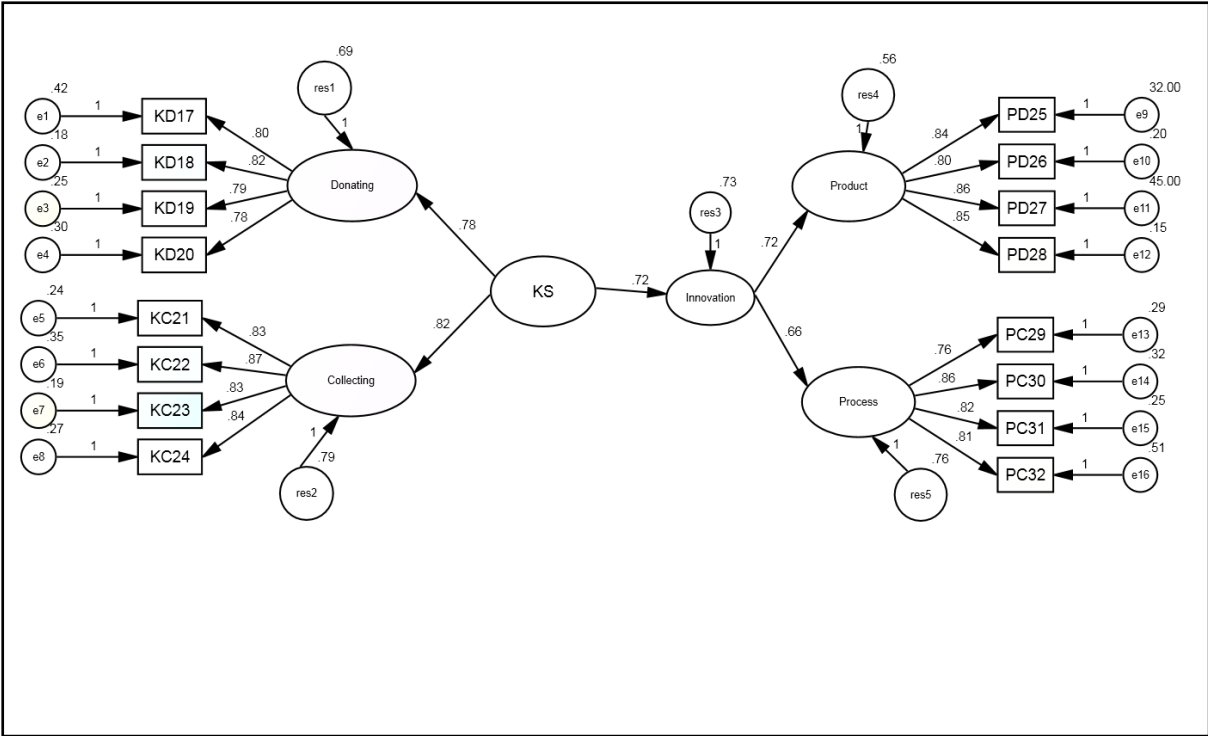
Figure 28: Direct effect of KS on innovation in public HEIs
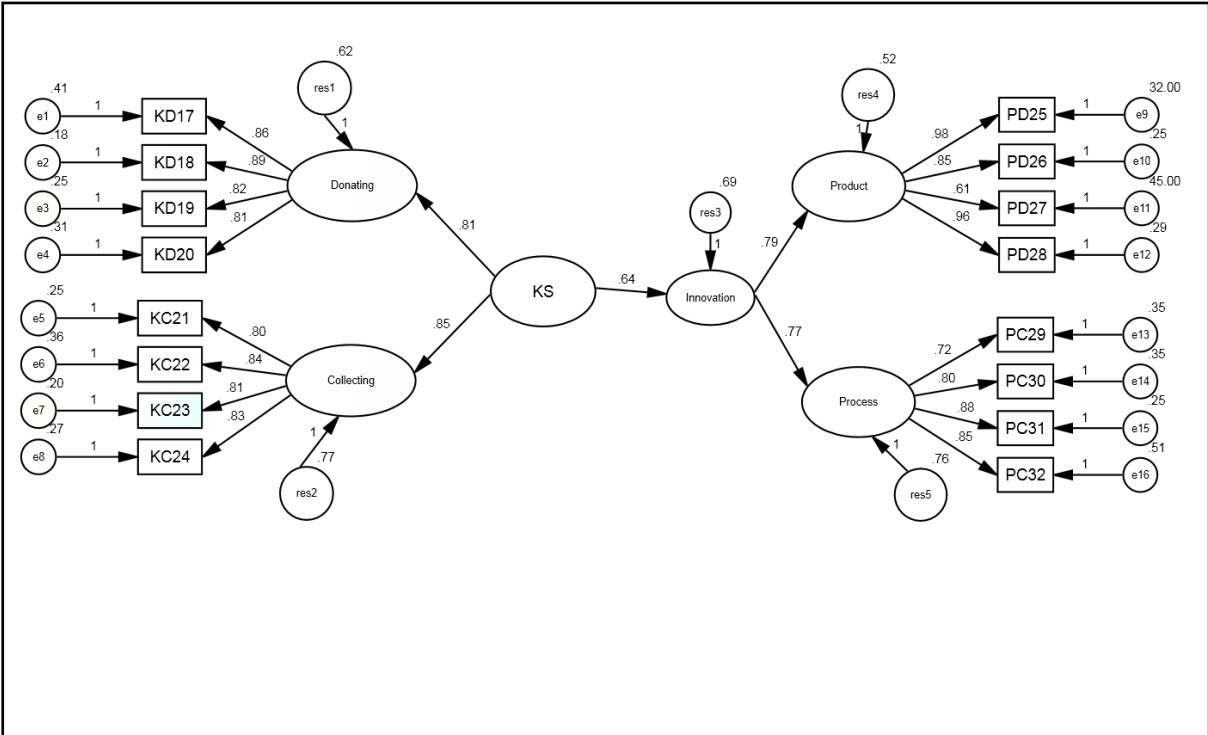
Figure 29: Direct effect of KS on innovation in private colleges

H4 predicts a positive effect of TL on innovation via KS in both sectors. Three main types of mediation have been reported in the literature (Blunch, 2012, Hair et al., 2010): partial, full, and, indirect. Partial mediation occurs when both the direct and indirect effects of TL on innovation are significant. Full means that the direct effect of TL on innovation drops out of significance when the mediator (KS) is added, and that the indirect effect is significant. Indirect mediation means that the direct effect (TL) was never significant, but that the indirect effect is.

The structural model was run using (ML) estimation with AMOS bootstrapping. This method is preferred because it is suitable for the normality of the sampling distribution of the indirect effect (Kline, 2005, Byrne, 2010). The results demonstrated an acceptable model, as shown in Table 33, suggesting that the structural model fits the data. The total effect in the public sector is (0.431) which consists of the sum of the effect of TL on innovation (0.213) and the indirect effect of TL on innovation via KS (0.218), and that in the private sector is (0.407).

Table 33: Direct and indirect effects of the hypothesised model for each sector

Hypothesised Path	Public			Private		
	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect
TL →Innovation	0.213*	-	0.213*	0.197*	-	0.197*
TL→ KS	0.730**	0.218*	0.431**	0.671**	0.210*	0.407**
KS → Innovation	0.729**	-	0.729**	0.649**	-	0.649**
Fit of the model	χ^2 = 573.86 with df= 457, χ^2/ df= 1.256, NFI = 0.911, CFI = 0.969, TLI= 0.967, and RMSEA= 0.032			χ^2 = 589.532, df= 458, χ^2/df= 1.287, NFI = 0.900, CFI = 0.976, TLI= 0.974, and RMSEA= 0.035		

Note: $p^* < 0.05$, $p^{**} < 0.01$

The squared multiple correlation (SMC) is equivalent to the coefficient of multiple determination in multiple (R^2) regression analysis and represents the amount of variance in a

dependent variable that is explained by the group of predictors (Kline, 2005, Hair et al., 2010). The predictors TL and KS have reasonable, overall, predictive power for the dependent variable, with 0.68 of the variance being explained by the proposed structural model, while SMC without KS explains 0.56 of the variance in the public colleges, so that Δ SMC = 0.12. In the private sector, SMC explains 0.65 while, without KS, SMC is 0.54 so that ΔSMC= 0.11.

These results confirm that the association between TL and innovation is mediated by the KS processes, and the indirect effect is greater than the direct effect in both sectors (see Figures 30-31).
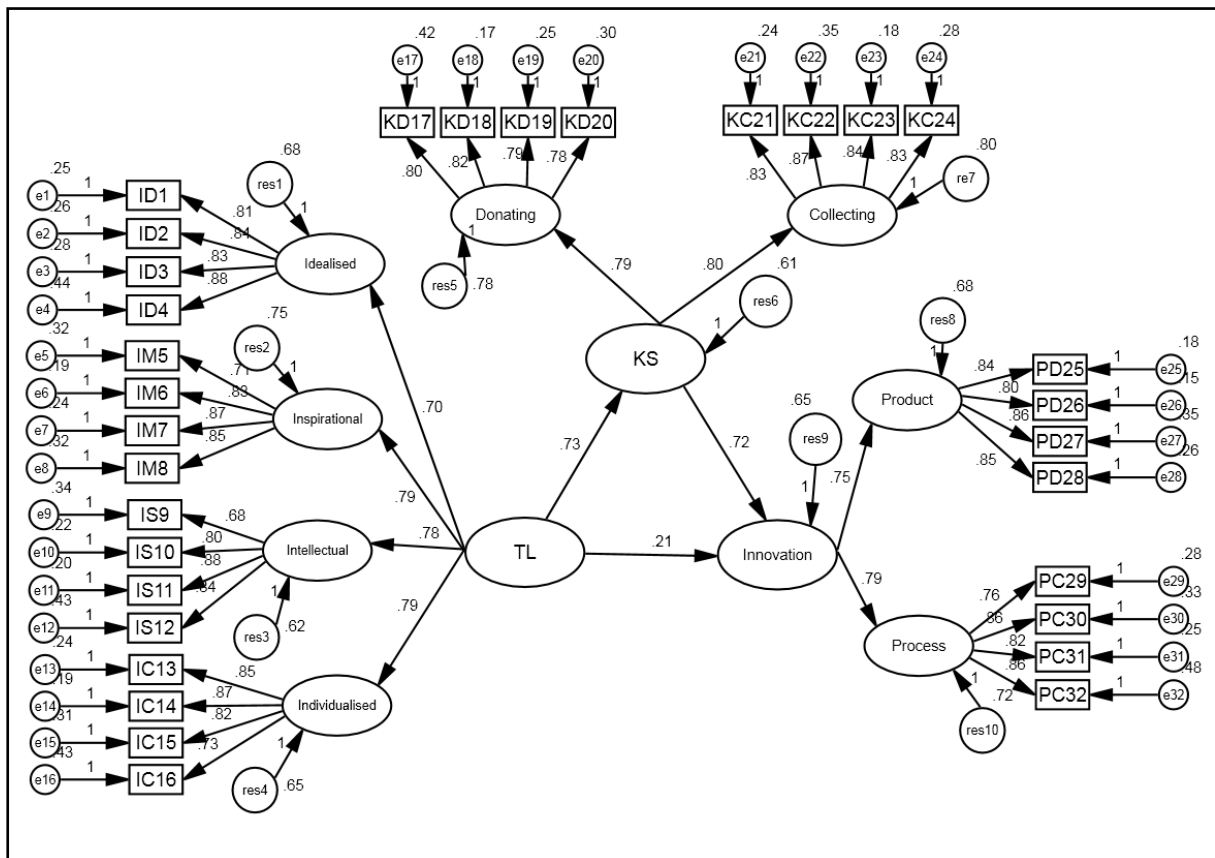
Figure 30: Hypothesised model-structural model in public HEIs
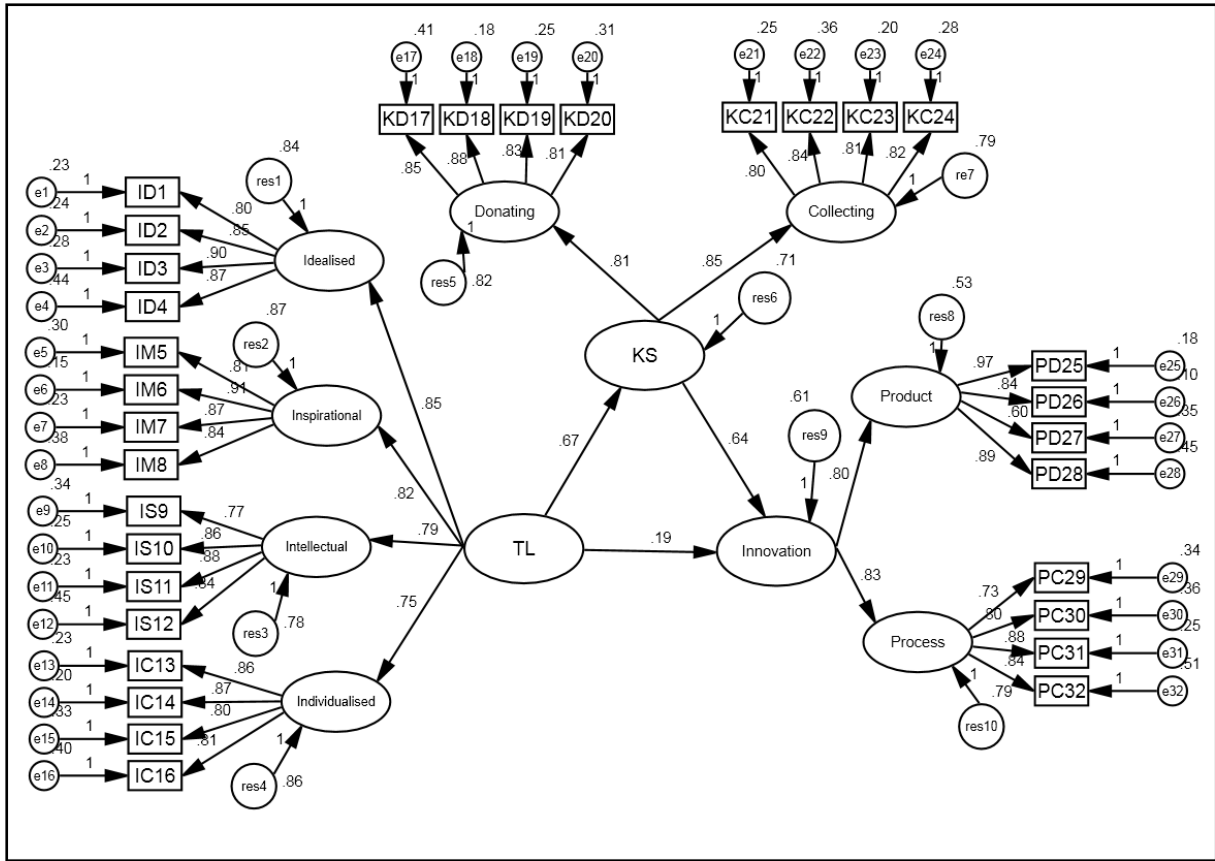
Figure 31: Hypothesised model-structural model in private colleges.

H5 concerns the sector-based differences in TL between the public and private colleges. This was tested using multi-group SEM invariance. The measurement invariance of the comparison was confirmed in section (5.5.2). The invariance of the constructs was tested by constraining their intercepts to be equal for both groups. If the χ^2 value difference between the two models (constrained and unconstrained) were significant at 0.05, this would mean there was a significant difference between the two sectors (Byrne, 2010, Hair et al., 2010, Kline, 2005)

The multi-group invariance analysis partially supported hypotheses *H5 (b-d)*. Table (34) shows that there are differences between the sectors in terms of individualised consideration and inspirational motivation because the $\Delta\chi^2$ statistic= 289.145, Δdf= 3 for inspirational motivation, and $\Delta\chi^2$= 292.150, Δdf=6 for individualised consideration, both significant at

p<0.05 between the unconstrained and constrained models of TL. There are no differences in idealised influence and intellectual stimulation.

Table 34: Multi-group differences in TL between sectors

Construct	Model	Chi- square (χ²)	df	Δχ²	Δdf	CFI	sig
TL	Unconstrained	279.077	101	-	-	0.968	N/A
Idealised	Constrained	279.155	102	0.078	1	0.969	NS*
Inspirational	Constrained	289.145	104	10.068	3	0.962	p<0.01
Intellectual	Constrained	285.220	106	4.143	5	0.967	NS*
Individualised	Constrained	292.150	107	13.073	6	0.970	p< 0.05

Note: NS* = not significant

H6, H7, and *H8* predicted differences in the pattern of relationships between the independent and dependent variables across sectors. Multiple-group testing was used to assess whether any of the significant hypothesised relationships in the baseline model differed for the public and private universities. Thus, structural invariance was conducted first, the structural coefficients in both sectors were left unconstrained for each relationship, and then equality constraints were added onto the structure weights. Significant differences in the χ² value and df between the unconstrained and constrained models at p<0.05 would indicate differences between the sectors regarding the hypothesised relations (Hair et al., 2010, Kline, 2005).

Table (35) shows that the path from TL→ innovation gave a χ² of 725.022 with df=492 and CFI= 0.974, After constraining the model, Δχ² became 16.111, and df=6 was significant at p<0.05. These results indicate that there are differences in the structural model between the groups. TL has a higher impact on innovation in the public (0.213) than the private (0.197) colleges. Thus, hypothesis *H6* was confirmed.

For the TL → KS relation, the χ^2 value was 645.708 with df =493 and CFI= 0.981. The change in χ^2 after constraining the model was 5.869 which is significant at p<0.05. This shows a significant difference between the public (0.730) and private (0.671) universities in terms of the relationship between TL and KS. Thus, hypothesis *H7* was confirmed.

Table 35: Multi-group analysis-structural path differences

Structural path	Model	χ^2	df	$\Delta\chi^2$	Δdf	CFI	Sig p
TL → innovation	Unconstrained	725.022	492	-	-	0.974	-
	Constrained	741.133	498	16.111	6	0.975	p<0.05
TL → KS	Unconstrained	645.708	493	-	-	0.981	-
	Constrained	651.577	495	5.869	2	0.983	p<0.05
KS→ Innovation	Unconstrained	633.362	115	-	-	0.974	-
	Constrained	640.110	117	6.748	2	0.976	p<0.05

Table (35) also shows that the χ^2 value of the impact of KS on innovation was 633.362 with df= 115. The difference in the χ^2 value between the two models was 6.748, significant at p<0.05, indicating a difference between the groups regarding the impact of KS on innovation. The effect in the public colleges was much higher (0.729) than that in the private colleges (0.648). Thus, *H8* was supported. Based on these results, Table 36 summarises the results of the hypothesis testing:

Table 36: Summary of the results of the hypothesis testing

Hypothesis	Description	Results
TL will positively influence product and process innovation in Iraq's public and private HEIs		**Supported fully**
H1	***H1a:*** Idealised influence will positively influence product innovation in Iraq's public and private HEIs	Supported
	H1b: Inspirational motivation will positively influence product innovation in Iraq's public and private HEIs.	Supported
	H1c: Intellectual stimulation will positively influence product innovation in Iraq's public and private HEIs	Supported
	H1d: Individualised consideration will positively influence product innovation in Iraq's public and private HEIs	Supported
	H1e: Idealised influence will positively influence process innovation in Iraq's public and private HEIs	Supported
	H1f: Inspirational motivation will positively influence process innovation in Iraq's public and private HEIs	Supported
	H1g: Intellectual stimulation will positively influence process innovation in Iraq's public and private HEIs	Supported
	H1h: Individualised consideration will positively influence process innovation in Iraq's public and private HEIs	Supported
TL will positively influence KS in Iraq's public and private HEIs		**Supported fully**
H2	***H2a:*** Idealised influence will positively influence KS in Iraq's public and private HEIs	Supported
	H2b: Inspirational motivation will positively influence KS in Iraq's public and private HEIs	Supported
	H2c: Intellectual stimulation will positively influence KS in Iraq's public and private HEIs	Supported
	H2d: Individualised consideration will positively influence KS in Iraq's public and private HEIs	Supported
KS will positively influence innovation in Iraq's public and private HEIs		**Supported fully**
H3	***H3a***: KS will positively influence product innovation in Iraq's public and private HEIs	Supported
	H3b: KS will positively influence process innovation in Iraq's public and private Iraqi HEIs.	Supported
H4	KS will positively mediate the impact of TL on innovation in Iraq's public and private HEIs	**Supported**
There is a significant difference in TL practice between public and private HEIs in Iraq		**Supported partially**
H5	***H5a:*** There is a significant difference in idealised influence practice between public and private HEIs in Iraq	Rejected

	H5b: There is a significant difference in inspirational motivation practice between public and private HEIs in Iraq	Supported
	H5c: There is a significant difference in intellectual stimulation practice between public and private HEIs in Iraq	Rejected
	H5d: There is a significant difference in individualised consideration practice between public and private HEIs in Iraq	Supported
H6	There is a significant difference in the impact of TL on innovation between public and private HEIs in Iraq	Supported
H7	There is a significant difference in the impact of TL on KS between public and private HEIs in Iraq.	Supported
H8	There is a significant difference in the impact of KS on innovation between public and private HEIs in Iraq	Supported

6.7 Summary

This chapter has presented the statistical results from analysing the data gathered in this study, starting with the characteristics of the sample, using SPSS version 20. SEM with AMOS 20 was used as an analytical tool to evaluate the model and to test the hypotheses of the model. SEM combines several statistical techniques such as factor analysis, path analysis and multi-group analysis. Construct validity, which consists of c convergent and discriminate validity, was established after deleting some items. The study found the model fit to the data to be acceptable in both sectors. The structural analysis validates the conceptual model of the study, KS mediates the causal relationship between TL and innovation.

Regarding the multi-group comparison of TL, the study found differences between the public and private colleges in terms of individualised consideration and inspirational motivation. Public universities favour individualised consideration, whereas private colleges tends towards inspirational motivation. No differences were found between the sectors in terms of idealised influence and intellectual stimulation. Multi-group structural equation modelling (MSEM) suggested there are differences in the relationships between TL, KS, and innovation, and between KS and innovation, across the sectors. The findings from the data

drawn from the use of quantitative methods are discussed further in the following chapter together with the qualitative findings.

CHAPTER SEVEN: DISCUSSION OF THE FINDINGS

7.1. Introduction

A conceptual model was developed to examine the impact of TL on innovation through the mediating role of KS processes, and the differences between these impacts in public and private Iraqi HEIs, based on a literature review. The model was analysed and tested using factor analysis, exploratory and confirmatory factor analysis, SEM, and multi-group SEM. The results revealed that KS plays a pivotal role in the relation between TL and innovation, and that there are similarities and differences between the two sectors in terms of TL practice and the pattern of relationships between the variables.

This chapter discusses the findings of the study. It integrates the quantitative with the qualitative results and links them with the literature review. The aim of using qualitative data in this study was to assist and explain any unexpected results from the quantitative stage regarding the differences in the TL practice and effect relationships between public and private HEIs. Thus, this chapter is divided into six sections: Sections 1 to 3 discuss the findings concerning the direct effects of TL on KS and innovation, and of KS on innovation. The fourth section discusses the mediating effect of KS on the relation between TL and innovation. Section 5 discusses the differences in TL practice across the two sectors. Finally, sections 6 to 8 discusses the differences in the pattern of relationships in the model between the public and private HEIs.

7.2. Transformational leadership and innovation

This section reflects the first objective of the study and discusses the direct impact of TL components on product and process innovation in both public and private HEIs. In addition, it answers Q1: *"What are the effects of TL, namely idealised influence, inspirational*

motivation, intellectual stimulation, and individualised consideration, on product and process

innovation in Iraq's public and private HEIs?"

The results of the SEM support the hypothesised relations (*H1a-H1h*), as discussed below:

Idealised influence was found to be positively related to product and process innovation in both sectors. This style of TL builds trust, and respect among organisational members. Leaders exhibiting this behaviour share the risks with followers, instil commitment in them, and show confidence in the organisational vision. These aspects encourage members of the organisation to work hard and be more innovative (Betroci, 2009, Bass and Riggio, 2012). The results of the current study indicate that the members of staff in Iraqi public and private HEIs recognise that their leaders possess idealised influence because they hold the respect, trust, and faith of their staff. As Alzawahreh (2011) noted, idealised influence is essential in an educational environment for instilling admiration, showing a sense of purpose, motivating teaching staff to improve, and creating a culture of change in which innovation is respected. Members of staff are more innovative as a result of taking and developing courses, research projects, and training programmes, and adopting new technology, when their leaders trust them and create a sense of pride in them. The findings of this study are congruent with the assertion that leaders with idealised influence enable a change in cultural values, leading to greater product and process innovation (Jung et al., 2003, Sookaneknun and Ussahawanitchakit, 2012, Vaccaro et al., 2012).

Inspirational motivation, is a behaviour by which leaders encourage communication processes, and organisational learning, and shape a vision that enables their organisation to be more innovative (Bass and Riggio, 2006, DuBrin, 2007). The findings of this study suggest that the members of staff surveyed prefer leaders with vision. This style of leadership helps public and private HEIs in Iraq to go through destabilising phases that are part of the change

process and are needed to meet long-term goals. Such leaders have the necessary skills to make members of staff feel valued and to help them realise the importance of the work they do. Previous research has found that leaders with vision create environments in which knowledge is shared, which promotes product and process innovation (Chang, 2012, Sarrors et al., 2008), and the results of this study tend support to that assertion within Iraqi HE environment.

Transformational leaders using intellectual stimulation, the third component of TL studied here, are most likely to enhance idea generation and exploratory thinking (Bass and Riggio, 2006). Organisational members who are encouraged by their leaders to formulate old problems in new creative ways and who know that their ideas are important and appreciated by their leaders are more likely to come up with innovative ideas for developing product and process innovation (Zhang and Batrol, 2010, Khan et al., 2009). The results presented here suggest that the members of staff surveyed from both public and private universities in Iraq feel that their leaders intellectually stimulate their creative thinking. Thus, they are encouraged to look at old problems in new and creative ways, and are made to feel that their contributions are valued. As a result, they are open to new approaches: for example, in relation to designing courses, research projects, and curricula, attending training programmes, and adopting new technology. These findings are inconsistent with Rafferty and Griffin's (2004) findings based on a study of 1398 employees in Australian public organisations, which showed that leaders with vision did not always have a positive influence on followers' innovation, and with Sarrors et al.'s (2008) study, which indicated that intellectual stimulation did not produce a climate for innovation within private Australian companies. However, the results agree with the assertions of others (Matzler et al., 2008, Pieterse et al., 2010, Moolenaar et al., 2010, Alzawahreh, 2011, Sagnak, 2012) who have suggested that

leaders exhibiting intellectual stimulation are necessary for innovation, particularly product and process.

The last of the TL dimensions is individualised consideration, Saenz (2011) mentioned that leaders who practice this style listen to their followers and care about their needs, and respect them by giving support, advice, coaching, and encouragement. They help their followers to increase their recognition of their own self-competence through feedback. By considering the ideas of each member of staff, a leader can develop an expanded source of knowledge that can help with collective problem solving (Northouse, 2007, Betroci, 2009, Bass and Riggio, 2012). Members of staff work harder and come up with more innovative ideas when they receive special attention and support from their leaders. This study suggests that transformational leaders in public and private HEIs in Iraq who show individualised consideration raise morale and provide members of staff with suitable teaching and coaching. As a result, they create new learning opportunities for them and value diversity, which enables the member of staff to come up with innovative ideas. The leaders are supportive as a result of using an interactive approach. They act as mentors, and motivate, guide, and assist the members of staff as they establish new courses or engage in academic research. Thus, leaders in Iraqi HE environment should care about their faculty because this increases trust and cooperation, encourages professionalism in their teaching, and decreases isolation. These findings confirm prior literature suggesting that leaders who use consulting, delegating, and supporting behaviour are able to foster the generation and application of ideas by employees (de Jong and Hartog, 2007, Zhang and Batrol, 2010, Pieterse et al., 2010, Sagnak, 2012).

The results show that TL has more of an impact on process than product innovation in both sectors. This is congruent with proposals from Jaskyte (2011), who found TL to be more effective in relation to process than product innovation. TL is defined as a process that transforms followers by making them more aware of the importance of task outcomes and

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encourages them to be more committed to organisational goals (Saenz, 2011, Northouse, 2007, Bass and Riggio, 2012).

7.3. Transformational leadership and knowledge sharing

This section covers the second objective of the study and discusses the direct impact of TL components on KS in public and private HEIs. Furthermore, it answers Q2: *"What are the effects of TL components namely: idealised influence, inspirational motivation, intellectual stimulation and individualised consideration on KS in Iraq's public and private HEIs?"*

The results of the SEM supported the hypothesised relations between TL and KS (*H2a-H2d*) in both public and private HEIs in Iraq. Prior literature has established that leadership style is related to KS (Tse and Mitchell, 2010, Shih et al., 2012, Song et al., 2012, Seba et al., 2012b). Bollinger and Smith (2001) noted that organisational culture plays an important role in enabling organisational members to work together and share their knowledge, hence TL is able to promote and cultivate norms and values that encourage and respect a KS culture (Zhang et al., 2006).

This study found that idealised influence was positively related to KS in both sectors. Leaders with idealised influence are admired and respected by their followers. They instil faith and pride in others, express confidence, and share risks with them (Northouse, 2007, Bass and Riggio, 2012). They move their followers motivation from their own self-interest to organisational goals (Betroci, 2009). Leaders exhibiting this behaviour have the ability to add value to an institute's activities, through knowledge creation, sharing, codification and the integration of both explicit and tacit knowledge (von Krogh et al., 2012). Barnett et al. (2001) noted that transformational leaders with this style can build a trust-based culture and a trust–based university/institute, as trust is found to be an essential element for KS (Cabrera and Cabrera, 2005, Chow and Chan, 2008, Nastase, 2009, Tan et al., 2010, Shih et al., 2012).

Followers who feel that their relationships have a high level of trust are not only willing to listen to others but are also able to absorb knowledge from them, and as a result they tend to become interested in sharing knowledge (Levin and Cross, 2004, Bakker et al., 2006, Hock et al., 2009). The results of the current study suggest that the teaching staff of the public and private HEIs in Iraq believe that their leaders encourage them to donate and collect their knowledge by discussing and exchanging their views, learning, experiences, and skills within and outside of their departments and their universities/institutes. Their leaders do so by demonstrating that they are trustworthy and care about their work. These results are consistent with Politis (2001) and Nguyen and Mohamed (2011) who pointed out that leaders who instil respect, and trust are able to facilitate knowledge acquisition and sharing among organisational members.

Transformational leaders who exhibit inspirational motivation are enthusiastic and optimistic. They inspire followers to engage and produce mission-oriented commitment by sharing their vision and expectations (Kelly, 2010, Saenz, 2011). Such leaders have the ability to articulate future prospects and encourage communication. They encourage their employees to engage in the vision by creating individual and collaborative team spirit (Yukl, 2010, Bass and Riggio, 2012). The findings of the current research support the proposition that inspirational motivation encourages KS processes among teaching staff in both sectors in Iraq directly, by arousing team spirit and stimulating staff to envision attractive futures for their universities. Such a style is necessary within an educational environment in Iraq as it helps teaching staff to connect and support the common vision. These results support Carmeli et al.'s (2011) findings that inspirational motivation is a critical component of TL and can encourage team spirit, cultivating the desire to help other team members and stimulating followers to engage in a shared vision and build relationships.

In terms of intellectual stimulation, transformational leaders can facilitate the search for new approaches and the establishment of a common vision (Bass and Riggio, 2006, Yukl, 2010, Saenz, 2011). Leaders exhibiting this style have the ability to challenge followers' assumptions and encourage them to look for new ways of solving problems from multiple perspectives (Morales et al., 2008). When leaders place a high value on knowledge and encourage their followers to question, and discuss their work, they empower them, and are more likely to encourage KS among them (Lee et al., 2010, Carmeli et al., 2011, Song et al., 2012). The findings of this study demonstrate that leaders in Iraq's public and private HEIs create opportunities that stimulate and encourage KS among teaching staff by challenging them to find technical solutions to problems, and to seek new approaches regarding teaching materials, teaching files, notes, and skills within and outside of their departments and universities. This confirms the results of previous studies (Chen and Barnes, 2006, Tse and Mitchell, 2010, Shih et al., 2012, Humayun and Gang, 2013) which have indicated that leaders who promote careful problem solving to their employees will be more likely to improve KS.

Leaders using individualised consideration tend to pay attention to the needs of their followers and develop their strengths through coaching and mentoring (Betroci, 2009, Bass and Riggio, 2012). Such leaders have the ability to listen to their concerns, to provide advice, and individual guidance to followers, and to encourage them to solve their problems, thereby providing them with opportunities to share their knowledge (Srivastava et al., 2006a, Shih et al., 2012) . This study has found that members of staff in both sectors feel that their leaders support and encourage them to share their contributions, collaborate, and enact joint decision-making processes. They encourage the sharing of knowledge by coaching them effectively to communicate with each other and listening to their suggestions on teaching operations and administrative issues through formal and informal meetings. These results contradict

Politis's (2001) assertion that leaders who practise individualised consideration are negatively associated with knowledge acquisition. However, they supplement the findings of Roth (2003) and Jahani et al. (2011) who demonstrated that organisations need leaders who play a mentoring role in order to encourage KS behaviour. The findings also support Yang's (2007b) study of leadership roles such as monitor, coordinator, director, producer, innovator, broker, facilitator, and mentor, and found that leaders who act as facilitators, mentors and innovators can enhance the effectiveness of KS. They also support Xue et al. (2011), who suggested that coaching and consulting types of leadership facilitate the application of KM. Furthermore, the results support numerous other studies (Singh, 2008, de Jong and Hartog, 2007, Behery, 2008, Lee et al., 2010, Song et al., 2012, Carmeli et al., 2011) that have found that consulting and delegating behaviours exhibited by leaders are positively associated with KM.

The strong relationships between the four components of TL and KS suggest that the practice of TL encourages teaching staff to engage in KS activities. According to Table 32, out of all the TL dimensions, intellectual stimulation has the strongest effect on KS processes, in both sectors. This may be due to the fact that the main work of HEIs is to do with KS (i.e. seminars, lectures, conferences, workshops,--etc.) and requires the intellectual capacities and tacit knowledge that are embedded in the minds of teaching staff to be transferred. Thus, the open sharing of ideas regarding teaching operations and explicit knowledge, through discussion and learning, is paramount. This is necessary for developing curricula, and for establishing training programmes and workshops. Singh (2008) indicated that intellectual stimulation enhances employees' sense of direction and creative thinking through KS. Thus, leaders exhibiting this behaviour help to boost KS practices and transfer knowledge among faculty members.

7.4. Knowledge sharing and innovation

This section covers the third objective of the study and discusses the direct impact of KS on innovation (product and process) in both sectors. It also answers Q3: *"What are the effects of KS on product and process innovation in Iraq's public and private HEIs?"*

KS processes were found in this study to be positively related to product and process innovation in both public and private HEIs in Iraq (*H3a* and *H3b*). According to the knowledge-based view, knowledge is a valuable resource of organisations (Nonaka and Takeuchi, 1995, Nonaka and Toyama, 2005). The role of knowledge sharing has emerged as an important area in the investigation of innovation in organisations (Spender, 1996, von Krogh et al., 2012). Knowledge sharing refers to a two-dimensional process whereby organisational members share and exchange their tacit and explicit knowledge. Daily interaction creates new knowledge through the process of knowledge exchange, donation, and collection (Hooff and Weenen 2004). The purpose of donating knowledge is to see tacit knowledge become explicit and owned by the entire group. Meanwhile, collecting knowledge refers to consulting people and seeking knowledge out, which in turn improves the entire stock of knowledge available to the organisation (Nonaka et al., 2006, von Krogh et al., 2012).

Product and process innovation is enhanced when organisational members exchange information, insights, skills, lessons learned, and experiences (Darroch and McNaughton, 2002, Wang and Wang, 2012). The knowledge-based view suggests that organisations need to generate as well as share knowledge (Alavi and Leidner, 2001, Dougherty et al., 2002, Michael and Nawaz, 2008, Nonaka and Toyama, 2005, Cheng, 2012). When knowledge is used, learning takes place, which in turn leads to changes of behaviour and innovation (Ichijo and Nonaka, 2007a, von Krogh et al., 2012).

Supar (2006) noted that the encouragement and practising of KS activities among teaching staff can enhance performance and create opportunities for innovation. The results of this study demonstrate that the members of staff surveyed in public and private Iraqi HEIs are willing to donate and collect their skills, insights, experiences, expertise, information and notes both inside and outside of their own departments, which enables their universities to improve their product (e.g. research and projects with other sectors, new courses, and curricula) and their process innovation (taking and developing training programmes and adopting new technology). Teaching staff in Iraqi HEIs exchanging their knowledge through forums, conferences, formal and informal meetings, seminars, and training programmes helps to diffuse innovations of product and process.

These findings contradict Jantunen's (2005) study, which concluded that knowledge acquisition and innovative performance do not have a significant relationship, and Ling and Nasurdin's (2010) findings indicating that KS is unrelated to product and process innovation, while knowledge acquisition has a positive relation to both within the Malaysian manufacturing sector. However, the findings of the current study do support the assertions of previous studies such as those of Leung (2010) and Cheng (2012), who both indicated that promoting KS practice within an educational environment helps members of staff to discuss different ideas about teaching methods, experiences, and skills that could increase the effectiveness of teaching and learning performance, thus supporting product and process innovation. The findings are also congruent with Ferraresi et al.(2012), who argued that KM processes, namely capturing, sharing, and application, can enhance innovation through the strategic orientation of the organisation.

From the SEM, it was seen that, the effect of KS on process innovation was much higher than that on product innovation. Heng et al.(2010) indicated, process innovation is an important way to achieve and support product innovation. Therefore, the introduction of

knowledge and the promotion of KS activities among teaching staff may help them to adopt innovations such as new training programmes, and new technology much more easily.

7.5 Mediating effect of KS on the TL-innovation relation

This section reflects the fourth objective of the study and discusses the indirect effect of KS on the relationship between TL and innovation. Moreover, it answers Q4: "*Does KS positively mediate the relationship between TL and innovation in Iraq's public and private HEIs?*"

The results from the SEM support the mediating role of KS in the TL to innovation relationship (*H4*). The results show that TL is positively related to KS, which in turn is positively related to innovation in Iraq's public and private HEIs. It is indicated that transformational leaders promote a KS culture among their teaching staff by practising idealised influence (building trust, respect, and admiration), inspirational motivation (encouraging commitment, team spirit, and communication), intellectual stimulation (seeking new approaches to teaching), and individualised consideration (considering their teaching staff's needs). Consequently, members of staff are willing to donate and collect knowledge, skills, experiences, notes and teaching materials, which in turn and according to the knowledge-based view lead to new ideas for courses, curricula, research projects, and new technology, aiding product and process innovation.

Although previous studies have identified a direct relationship between TL and innovation (Eisenbeib and Boerner, 2010, Chang, 2012), the current study has found no such relationship in the case of Iraq's public and private HEIs. This finding is in line with the view of Jung et al. (2003), who argued that TL could both directly and indirectly enhance organisational innovation. The results of the present study suggest that TL indirectly enhances product and

process innovation in Iraq's public and private HEIs by creating an organisational culture that supports KS.

7.6 Differences in TL practices between public and private HEIs

This section covers the fifth objective of the study and discusses the sectoral differences in TL practices between public and private HEIs in Iraq. Furthermore, it answers Q5: *"Are there differences in the TL practice, namely idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration, between public and private HEIs in Iraq?"*

The multi-group SEM showed no differences in TL across the two sectors (*H5a* and *H5c*) in either idealised influence or intellectual stimulation. Furthermore, the qualitative findings (interviews-stage 2 of the study) revealed that the leaders in both sectors enjoy the trust and respect of their teaching staff due to their communication style. They show pride in their members of staff by being attentive towards them. Furthermore, they are innovative and flexible regarding teaching methods and administrative issues. They show divergent thinking in using brainstorming, new approaches and discussion (see Appendix 6).

In terms of idealised influence, leaders from both sectors mentioned "*trust and respect*":

> *"Actually, I interact freely with my staff, listen to their concerns, and maintain a mutual respect for their opinions. In addition, I am always ready to share problems with them" (DD2-public).*

Another leader said:

> *"My members of staff mostly refer to me for direction in their work-- I would not be exaggerating if I said that I had won their trust and confidence" (DH5-public).*

Regarding the private sector:

> *"I believe my members of staff have trust in me because they often discuss issues concerning work and their private lives with me" (HD3-private)*

> *"There are no signs of edginess between us, so I believe they are comfortable with my presence" (HD5-private)*

However, some of the leaders in both sectors said that they were "*proud*" of their members

of staff because they were attentive towards each other:

> *"I am proud of some of my staff because they are supportive and have good relationships with each other. They have created a good reputation for my department through the way they have organised it. I believe in them, so they feel relaxed in my presence and don't let me down" (HD5-public).*

One of the leaders from one of the private colleges said:

> *"My members of staff are committed and professional and are able to meet time schedules, so I am very proud of them" (DD1-private).*

From the interviews, it appears that the leaders in both sectors practise intellectual stimulation

by seeking "*new ways*" of teaching, "*rethinking*" through brainstorming, "*sharing*

information" regarding teaching and administration issues, and seeking "*different views*":

> "*I give opportunities to the academic staff to share new information so as to help them adapt from old methods of teaching to new practices. In addition to that I always listen attentively to their problems to ensure there is a supportive learning environment" (HD4-public).*

Along the same line, another leader said:

> *"For me ---- personally I lead by example. I become skilled in new techniques before expecting mature teaching staff to take up such challenges. I anticipate that with this approach my staff will change from old methods of teaching to embrace current practices" (HD3-public).*

From the private colleges, the following comments were obtained:

> "Within my department, I encourage workshops to share information and to brainstorm in order to come up with appropriate solutions to challenging situations" (HD3-private).

> "I always seek new research topics on relevant issues and I strive to elicit views from the staff" (HD4-private).

With respect to inspirational motivation and individualised consideration, both the quantitative and qualitative results show differences between the two sectors *(H5b-d)*. The public universities appear to prefer individualised relations with the teaching staff, including "*coaching, mentoring, and counselling*". The leaders believe that this increases innovation:

> "I mentor my teaching staff by taking them through an orientation and thus help them with publishing their research" (HD4-public).

> "For me, I deal with members of staff individually, particularly if they are from the same department and specialisation, and give them my experience so they can benefit from it. For instance, how to deal with his/her students, how to enhance training programmes, or how to develop him/herself scientifically" (DD2-public)

Another said:

> "I feel happy when my staff ask me to assist them by sharing notes, activities, and slides relating to teaching courses" (HD4-public)

Meanwhile, in the private colleges, the leaders believe that inspirational motivation provides members of staff with "*encouragement*" for the idea generation process:

> "In my view, inspiration is the basis of motivation. It is a kind of motivation that stimulates the teaching staff and increases their commitment to meet educational aims and be innovative in their work--- In fact, I am able to say that, via a strong vision, I can motivate staff and create a shared insight for them" (DD1-private)

Two other leaders made comments on the same track:

> "We need shared vision in the department and I always encourage a team spirit in order to motivate my members of staff to become committed" (HD5-private).

> *"In terms of performance as a department and contribution to the university, I often talk to my members of staff enthusiastically about achieving the vision because I want my department to become the best department in the college" (HD2-private).*

Additionally, the leaders in the public universities consider their staff members' *"attention needs"* and try to *"develop"* them by practicing individualised consideration to greater extent than the leaders in the private colleges do:

> *"My door is always open for all staff that need special attention, advice, and support, and I am ready to listen to their specific issues" (HD3-public).*

> *"Part of my duty towards my staff is to develop them socially, to improve them personally and even to make sure that they are happy with their colleagues and families" (HD5-public).*

Meanwhile, a leader from one of the private colleges, said:

> *"Some members of staff like to talk about their private problems. I try to help, but I think the lecturer should solve his/her problems by him/herself because I don't have the time" (HD3-private).*

> *"Actually, I avoid individual advice regarding teaching or administrative issues and prefer group training because, in my view, it gives the staff collective benefits and independence at work" (HD5-private).*

These results are inconsistent with some previous studies (Bodla and Nawaz, 2010, Hukpati, 2009, Al-mailam, 2004, Majumdar and Ray, 2011, Nawaz and Bodla, 2010) which found no differences in TL practises between the public and the private sector, but are congruent with Moor's (2000) view that the competency of transformational leaders might be more important in the public sector because the social purpose of these organisations is more salient. Studies such as Hickson et al. (1986), Volkwein and Parmley (2000) and Mukherjee and Ray (2009) point out that managers in public organisations have closer relationships with their employees than do their private sector counterparts.

Although, the leaders in Iraqi public and private universities exhibited some of the characteristics of transformational leaders (M=3.337 public), (M=3.194 private), they did not

display them at optimum levels. Their level of TL can be categorised as a medium level of effectiveness, whereas a rating of more than 4, would indicate an optimum level (Bass and Avolio, 2003).

7.7 Differences in the impact of TL on innovation across public and private HEIs

This section covers the sixth objective of the study and discusses the sectoral differences in the pattern of relationships between TL and innovation between the public and private HEIs in Iraq, as well as answering Q6: "*Is there a significant difference in the impact of TL on innovation between the public and private HEIs in Iraq?*"

The multi-group SEM *(H6)* indicated that there are differences between the two sectors: the impact of TL on innovation is much higher (0.213) in the public than in the private HEIs (0.197). Using NVivo software to analyse the interviews that conducted with the leaders in the stage 2 of the sudy, several explanations for this difference arise: First, there is the issue of "*job security, benefits and commitment*" for both the leaders and the members of staff. The public sector today provides stability and good benefits for its staff, which results in staff commitment (see Appendix 7):

> *"The job stability for the teaching staff is good and incentives are received which tend to increase the commitment and the willingness to work efficiently for the benefit of the department or the university" (D1-public).*

In contrast, in the private colleges, members of staff are more concerned about their salaries and the stability of their jobs:

> *"Some of the lecturers in the department have temporary contracts and their salaries will expire when the contracts end" (HD4-private).*

Past literature has found that employees are more willing to work effectively for their organisation, and are less likely to leave, when their job security and thus commitment are high (Alam et al., 2009). Job security reflects an employee's subjective anticipation of

employment stability and job continuity within an organisation (Probst, 2003). Loi et al. (2011) noted that job security contributed to the performance of employees of telecommunications companies in China. It has been argued that an increase in job security for top management will results in greater organisational commitment (Morris et al., 1993). Strong commitment from employees is also shown to lead to a good level of service quality (Sahney et al., 2008). Finally, in order for innovation to succeed in an organisation, it is said that, commitment is required from the leaders (Michaelis et al., 2010).

Although previous studies have indicated that job security, salaries and commitment from both leadership and employees are higher in the private sector than in the public sector (Khalid et al., 2012, James and Kelli, 2000, Houston 2000, Goulet and Frank, 2002, Buelens and Broeck, 2007), the results of the current study indicate that this is not the case in Iraqi HEIs. It seems that the public universities' leaders are more willing to take risks and implement innovative change than the leaders of the Iraqi private colleges.

Secondly, the interviews showed the "*annual budget*" to be an important issue in the public sector. This covers; developing and running training programmes, research projects, and developing courses

> *"There is an annual budget allocated by the MOHESR for Innovation to each university and institute, covering aspects, such as training programmes, research projects, the development of academic staff, scholarships and incentive systems" (DD2-public).*

> *"Each term I receive financial support for my department from the Department of Finance at the university and this is for spending on various items, for instance, the establishment of scientific conferences, faculty research funding, and the purchase of new IT equipment for the development of the teaching process. As I am Head of Department, I am responsible for this and must present a report to the Dean" (HD5-public).*

Similarly, another leader (HD3-public) said:

> *"There is a contribution from the MOHESR to encourage the publication of scientific research in international journals, with funds to disperse as financial rewards for teaching staff in the case of publication".*

He added:

> *"Our university gives the members of staff financial rewards when they upgrade their academic qualifications" (HD3- public).*

Another said:

> *"There is funding given by the university to provide research support to the members of staff" (HD4-public).*

However, in the private colleges, the dependence on self-funding causes the leaders to encourage their staff to undertake research projects without funding:

> *"Our college relies on self-funding for the development of training programmes and the establishment of conferences" (DD1-private).*

Another leader made a similar comment:

> *"Our college encourages scientific research but unfortunately there is no funding for the members of staff for this purpose" (HD4-private).*

Another leader said:

> *"My college annually establishes scientific conferences, seminars, and workshops in collaboration with outside parties, from its budget" (HD3-private).*

The above results might be due to public universities in Iraq tending to have a longer-term orientation towards innovation, whilst Iraqi private colleges tend to focus management attention on the immediate future. Thach and Thompson (2007) asserted that public and private organisations vary in terms of accountability, budgets, and ownership. In this regard, Brain and Lewis (2004) noted that culture, context, and their differences play a large role.

According to Hofstede et al. (2010), cultures maintaining a long-term-orientation are characterised by values emphasising the importance of the future. Hence, in order, for innovation to be embraced, there must a belief in some future pay-off that justifies persevering in the present.

On the other hand, with short-term orientation leaders tend to want an immediate result or look for a "quick fix", with an emphasis on present needs or past success. This finding of the current study is in line with the assertions of Ackroyd and Crowdy (1990) and Lee (2007), who pointed out that studies looking at cultural differences have observed variations between sectors and even between different groups working on the same floor of the same department . Additionally, the core business in private HEIs is teaching, with little emphasis given to research (Wilkinson and Yussof, 2005).

Furthermore, in the public universities, all interviewees agreed that MOHESR has taken a new direction of late. There is now more emphasis on "*competitive criteria*" in the selection of academic leaders. Academic tenure is dependent on performance:

> *"We are responsible for giving a high level of performance, for `the department and the university. At the end of each academic year we report in detail to the top official explaining the work that has been done during that period" (HD5-public).*

> *"Good performance is multifaceted including the publication of research, the number of undergraduates and postgraduates supervised, the number of training courses attended, collaborative research projects achieved with public and private institutions, responsiveness to new technology, ect." (HD3-public).*

In the private colleges, meanwhile, there is no competition for the leadership positions:

> *"There is no competition for the leadership position, but there is competition among private colleges to provide better performance so as to attract a larger number of students" (DD1-private).*

Bowman (2002) takes the view that the success of each HEIs can be measured by the success of its leaders. Deans, their deputies and the heads of departments are the first tier of leaders,

and directly influence the quality of their institutions. The findings from the current research agree with Yukl's view (2010) that the effectiveness of leadership within an academic environment must be measured by the success of the organisation in terms of performing tasks and accomplishing goals in quick time.

Another MOHESR direction that came out of the interviews was the "decentralisation" and "*autonomy*" of academic work:

> *"The universities currently have autonomy and are decentralised in terms of their academic work, and are free from political influence. The Chancellor or Dean of the university has academic decision-making authority" (D1-public)*

However, while there is decentralisation in the private colleges as well they are dependent on the rules of the ministry in some cases:

> *"True we have independence in academic work, but the college depends on the regulations and instructions issued by the Ministry of Higher Education" (DD1-private).*

Levy (1992) defined autonomy as freedom from regulation and control. Chen et al. (2012) argued that decentralised organisations have more flexibility, which facilitates openness and creative behaviour. Decentralisation is the delegation of decision-making authority throughout the organisation. It provides and creates an environment that increases communication and commitment among the organisational members (Islam et al., 2010). Therefore, as shown in this study, the effect of TL on innovation is more positive when the organisation is decentralised.

Lam (2002), on the other hand, found that organisational factors such as decentralisation of the work play an important role in TL's effectiveness. Further empirical support for the findings of the current research was provided by Zhu et al. (2005), who indicated that, when individuals work in an environment with high task autonomy, they tend to produce more ideas.

It is clear that the relationship between TL and innovation in Iraqi HEIs is dependent on organisational characteristics. These results go against the traditional ideation of the public universities in Iraq as being more conservative and less open to change than private colleges, and suggest that there is scope for improvement in the ministry policies aimed at enhancing product and process innovation in Iraqi public HEIs.

7.8 Differences in the impact of TL on KS across public and private HEIs

This section reflects the seventh objective of the study and discusses the sectoral differences in the pattern of relationships between TL and KS in HEIs in Iraq. It also answers Q7*: "Is there a significant difference in the impact of TL on KS between public and private HEIs in Iraq?"*

The results of multi-group SEM *(H7)* indicated that there are differences between sectors and the impact of TL on KS processes is higher in the public (0.730) than the private colleges (0.671). The interview findings (stage 2 of the study) hint at several strategies used by the leaders that might enhance their faculty members' KS activities (see also Appendix7). The first is "*reward systems*". All interviewees from both sectors stated that they used monetary and non-monetary incentives to promote KS among staff, although the practice seems to be more dominant in the public HEIs than the private colleges. For instance, within the public universities, one of the leaders said:

> "*I always use non-monetary rewards besides material rewards, such as thanks, gratitude, appreciation and promotion, when members of staff establish training courses or participate in student symposia--- in my view this strategy encourages the staff to get involved in activities, ultimately contributing to the exchange of knowledge within the department" (HD3-public).*

Along the same track, another leader expressed his view about this strategy, saying:

> *"The university rewards the teaching staff when they engage in KS activities, such as through course reductions, additional sabbaticals dedicated to research, financial support for research-related travels, support for seminars and financial incentives. This strengthens the teaching staff's competitiveness with each other and allows them to develop important strategies for the future regarding KS activities"* (DD2-public).

Within the private sector, one leader commented:

> *"It is true that our college financially rewards members of staff in the case of their participation in formal and informal activities to exchange ideas and observations that facilitate the dissemination of research and the development of teaching methodologies, but not always because this depends on our budget"* (DD1-private).

Reward systems can be monetary or non-monetary. It is reported in the literature that such systems are important in motivating organisational members' performance and helping to produce excellent KS abilities among them (Tan et al., 2010). Such systems also highlight the things that the organisation feels are important (McDermott and O'Dell, 2001). These results are congruent with Sohail and Daud's (2009) assertion that leaders within an academic environment should use reward systems to encourage KS. It is argued that employees tend to generate new knowledge and share their existing knowledge when their leaders motivate them financially (Babalhavaeji and Zahra, 2011, Hitam and Mahamad, 2012). Within Iranian public universities, Jahani et al. (2011) found that reward systems and mentoring leadership play a major role in facilitating KS activities among teaching staff. Similarly, Kim and Ju (2008) noted that rewards were important among faculty members at one private university in Korea, encouraging them to express, exchange, negotiate, and understand tacit knowledge. Zawawi et al.(2011) argued that one of the barriers to the generation and exchange of knowledge between faculty in public universities in Malaysia was reward systems. Liu and DeFrank's (2013) findings demonstrated that a TL climate and KS incentives are critical factors for the practising of KS within R&D departments in industrial organisations in

Taiwan. Additionally, Cheng et al. (2009) indicated that leaders who use incentives are able to facilitate the integration of employees' skills, knowledge, and experiences into organisational knowledge through KS.

Promotion and other monetary rewards are also fundamental factors for knowledge creation and sharing. Oldham (2003) mentioned, for instance, that recognition and appreciation for the employees plays an important role in getting them to engage in KS activities. In the same context, Scott (2003) pointed out that employees prefer acknowledgement and personal development to increases in salary.

Although the prior literature (Moon, 2000, Willem and Buelens, 2007) has mentioned that the use of reward systems as a strategy to promote KS activities is more effective in the private sector than the public sector, the results from the interviews conducted for this study contradict such a view. It is obvious that the leaders' strategies in Iraqi HEIs regarding financial rewards vary according to the budget their sector and it seems more important in public than private colleges.

The second factor is "*performance appraisals*". The majority of the leaders in both sectors mentioned that the practice of KS by faculty members was related to their performance appraisals. The strategy appears to be imperative for the Iraqi public HEIs:

> "*Currently, the annual performance review of the teaching staff depends on their publication of research and their participation in conferences and workshops. This evaluation is important for them because receiving a 'good' appraisal, could help them to acquire a scholarship, for example, or to be promoted to a higher administrative position. Therefore, there is tough competition in terms of conducting such activities so as to be marked as a 'good' performer" (HD5-public).*

Another said:

> "*Members of staff in my department are aware that the assessment of their performance depends on their establishment of workshops or sessions within and outside of the department and the university. Such events are aimed at encouraging them to exchange and discuss their*

experiences and skills, as well as the methodologies of the teaching profession" (HD4-public).

On the same topic, one of the leaders said:

> *"Faculty members' performance is measured through their participation in local and international scientific conferences, the publishing of research papers, and organising discussion groups to discuss and present the results of their published research papers so that other staff in the department can benefit, in addition to their commitment to the job"(HD3-public).*

Within private colleges too, the performance of the teaching staff is important, but here it does not seem to be related to promotions, scholarships, etc--:

> *"The performance of teaching staff who have permanent contracts with the college is measured based on their job commitment and their participation in scientific activities, conferences or the setting up of seminars" (HD2-private).*

The results reflects that the practice of KS is linked with the performance appraisal of the teaching staff, which confirms Ling's (2009) view that the most effective method of promoting KS is to link it to the performance measurement of the employee. When members of staff realise that their KS is related to their evaluation, they are certainly likely to try not to get a low ranking (Jain et al., 2007) and are more likely to seek out KS practices and consider them a part of their job responsibilities (Oldham, 2003). Research carried out in public universities in Malaysia has demonstrated that the critical factor in promoting KS activities among faculty members is to relate it to the performance appraisals of the staff (Jain et al., 2007, Sandhu et al., 2011). It has also been argued that the practising of KM could be used as a criterion in employees' performance evaluation. (Martensson, 2000).

Additionally, the interviewees mentioned that they provide and support "*a physical work environment and internet*" to facilitate KS among faculty members. Again, those in the Iraqi public universities receive financial support so as to provide a suitable physical work

environment, while access to the internet is free. In contrast, the private colleges are dependent on self-funding and access to the internet is not free:

> *"There is support from the university that allows us to provide a physical work environment to facilitate the exchange of knowledge regarding teaching operations and administrative issues, such as computer networks, billboards and the internet"* (HD3-public).

> *"All teaching staff can access and search for knowledge and information regarding papers, books, and theses through the virtual library for free"* (HD5-public).

An interviewee from one of the private colleges stated:

> *"The college has halls equipped with the latest electronic devices for establishing training courses, seminars, and scientific conferences, and this of course facilitate KS, but access to the internet is not free"* (HD5-private).

The physical environment, comprising technology, equipment, computers, buildings, and the internet, plays a significant role in promoting KS. Past literature has indicated that creating suitable physical environment within public universities can help teaching staff to work in the common interest by sharing knowledge (Jain et al., 2007, Sandhu et al., 2011). Riege (2005) noted that the physical environment is one of the barriers to KS. IT and the internet also facilitate interaction among organisational members (Abodulah et al., 2009). Through the internet, employees can not only share their work within the organisation, but also across a wide geographical area (Connelly and Kelloway, 2003). IT can enable rapid searches, the access to and retrieval of information, and support for communication between organisational members (Zaqout and Abbas, 2012). Sohail and Daud (2009) noted that IT and a supportive workplace are essential for KS among employees. Zawawi et al. (2011) supported the idea and pointed out that leaders should support (ICT) because it plays a major role in making sure that KS can work. Other previous empirical studies have confirmed the results in the current study regarding public organisations, by demonstrating that technology and the workplace environment can be a major obstacle to KS (McAdam and Reid, 2000, Gorry, 2008).

Despite the commonality between the two groups, the findings seem to show that public HEIs in Iraq are slightly more advanced than the private colleges, for instance in terms of IT facilities. They have developed a digital media infrastructure that can assist KS, including virtual workshops, digital-media video files that can be distributed over the Internet, and a virtual library on the HEIs' websites.

Thirdly, the factor of "*time allocation*" appeared from the interviews to be essential for practising KS in the public universities, but less so in the private colleges:

> *"Every month there is a session dedicated to discussing new subjects and exchanging experiences, ideas and knowledge among the teaching staff, which facilitates the conversion of tacit knowledge into explicit knowledge" (HD3-public).*

> *"There is a regular time slot for seminars within the department, in which teaching staff present their work and exchange their learning"*

> *(HD5-public)*

> *"Most of the members of staff in my department have temporary contracts and they haven't the time to practise KS activities such as establishing training programmes or workshops because they have other work outside the college. They just come to lecture" (HD2-private).*

The literature demonstrates that time allocation is necessary in order for employees to create, search for and share new things and knowledge. For instance, Ling et al. (2009) and Sandhu et al. (2011) both found lack of time to be one of the main barriers to KS among faculty members in Malaysian universities. Riege (2005) pointed out the necessity of having a specific time dedicated for the sharing of knowledge such as learning channels and training. Additionally, Seba et al. (2012b) argued that it is important for public organisations to devote time to promotion of KS.

Thus, it seems that from the previous literature the success of KS practice is related to the time allotted to it by the leaders. The results in the current research demonstrate that the faculty members in the Iraqi private colleges have no time to participate in additional

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activities aimed at KS, such as training programmes or brainstorming, sessions, because they have temporary contracts with their colleges. Meanwhile, in the public universities in Iraq, there is job security for all teaching staff, which gives them the time to discuss and share their skills, ideas, and experiences. Consequently, the greater time allocated to KS in Iraqi public universities compared to private colleges is perhaps reflected in the higher impact of TL on KS in the public sector.

7.9 Differences in the impact of KS on innovation across public and private HEIs

This section reflects the eighth objective of the study and discusses the differences in the impact of KS on innovation between public and private HEIs. Moreover, it answers Q8: *"Is there a significant difference in the impact of KS on innovation between public and private HEIs in Iraq?"*

Again, according to the multi-group SEM (*H8*), there are differences between groups and the effect of KS on innovation was much higher in the public universities than the private colleges in Iraq. The interviews (stage 2) indicated that Iraqi public HEIs use various strategies to facilitate and motivate their faculty to share knowledge and innovation, in contrast to the private colleges (see Appendix7): Firstly, they *"rewards systems and recognition"*:

> *"Our university encourages the exchange of knowledge and rewards faculty members who publish research papers in international journals"* (HD-5 public)
>
> *"The Ministry grants a financial reward to those who gain patents in their specialisations"* (D1-public).
>
> *"The faculty management encourage the members of staff to publish research and give them a financial reward. May be it differs from the bonuses in public universities because it depends on the budget of the college"* (HD-3 private).

On the other hand, some of the interviewees from the public universities mentioned a reward system named "*Care of the scientists*":

> *"The Ministry annually rewards those faculty members who publish at least three pieces research in specialised international journals. They also apply the Scientists Care Law, and give them moral and financial privileges"* (HD4-public).

Another said:

> *"There are a scientific prizes granted to the teaching staff by the Ministry, such as the innovation prize for scientific creativity and the prize for the best research project"* (HD3-public).

Previous research has suggested that organisational context plays an important role in facilitating the sharing of knowledge (kang et al., 2008b). KS practice may benefit from organisational factors such as reward systems, helping the organisations to access tacit knowledge embedded in the minds of the organisational members and convert it into explicit knowledge (Wang and Wang, 2012), through the donating and collecting of knowledge for the enhancement of product and process innovation. Under reward systems, employees are not only more likely to exchange their knowledge and experiences but also to seek different approaches to their work (Ling et al., 2009). Knowledge creation and sharing activities cannot achieve product and process innovation without individual employees being inspired by a motivational climate.

The findings from the interviews in the current study are somewhat mixed. They contrast with the results of (Bock et al., 2005, Lin, 2007) but are consistent with Chang et al.'s (2007) study which demonstrated that reward systems for members of staff might be an effective mechanism for fostering KS and innovation, and Taylor and Wright's (2004) findings that innovative ideas come from employees when there is a system for rewards. Additionally, Bartol and Srivastava (2002) found that KS practices and innovation among employees could be increased in the workplace if they were linked to appropriate reward systems.

Secondly, "*top management support and learning orientation*", is another strategy that influences the KS-innovation relationship. The majority of the leaders in the public HEIs in

Iraq indicated that MOHESR provides a good climate that supports KS, such as funding research scholarships for postgraduate students (Master's and PhDs) and their supervisors to study outside Iraq for six months. In contrast, in the private sector, there is a lack of support from the leaders. It appears that the leaders in this sector tell teaching staff what is expected of them, but do not show them how to meet those expectations:

> *"There are research trips dedicated for postgraduate students such as Master's and PhDs, allowing them to go abroad with their supervisors during the research stage for a period of 6 to 12 months for the purpose of completing their research. The Ministry funds these trips" (DD2-public).*

> *"Annually, the Ministry announces research trips abroad for those faculty members who have a doctorate, for one year, in coordination with international universities. The Ministry funds these trips" (HD5-public).*

Regarding learning orientation, the interviewees reported that the Ministry funds "*skills and training programmes*" for public universities teaching staff abroad:

> *"The Ministry provides training opportunities abroad for the teaching staff and facilitates all financial and administrative procedures for their travel, such as training programme funding, accommodation, visas, booking flights, etc--" (D1-public).*

Another interviewee commented:

> *"The university supports the faculty to go to leading international conferences and workshops and provide funds for them. This is useful as it allows them to seek out knowledge and develop individual and organisational performance" (HD3-public).*

In the private colleges, meanwhile, there is no funding because there are no postgraduate students:

> *"We do not have research trips for the students because the college only provides preliminary studies, and most of our training programmes for members of staff are inside the country" (DD1-private).*

Management support is considered to be a driving force that provides an environment that helps employees to share and contribute their knowledge for the achievement of mutual goals

(Vera and Crossan, 2004a). Ribiere and Sitar (2003) pointed out that top management support plays a key role in influencing the success of KS in terms of fostering innovation. Individual knowledge is not easy to translate into organisational knowledge and practical use. When employees have a supportive climate, they are more likely to exchange knowledge and try novel approaches to their work (Huang and Li, 2009).

Abdallah et al. (2012) argued that weak management support is the main obstacle to innovation. Kamalian et al. (2011) indicated that a lack of financial support from the top management hinders innovation that depends on KS activities. Brachos et al.(2007) noted that management support and learning orientation are crucial for fostering knowledge transfer and innovation. Educated organisational members are the most critical element of innovation success, and organisations with strong educational systems do better in terms of innovation leadership. Organisations need to formalise their training programmes, and develop and provide support for training committees (Charles, 2004).

Additionally, the leaders in the public universities indicated that there is *"management commitment"* from MOHESR to promote KS, but it seems that is not compulsory for private colleges:

> *"There is a commitment from and formal guidance offered by the university to promote the exchange of knowledge. For instance it has become compulsory for each lecturer to present at least one seminar and publish research each year along with other activities" (HD3-public).*

> *"The duties of the department are to establish training courses, scientific conferences, and seminars within and outside the department or the university, and at the end of each term I must provide a detailed report about the activities that have been carried out to the scientific unit in the university, which is responsible for evaluating the performance of the department" (HD4-public).*

Nonaka (1994) explained that the key to the success of KS is individual and organisational commitment. It is argued that commitment from senior management plays an important role

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in successful KS (Ribiere and Sitar, 2003). To enhance innovation, managers must show commitment towards the KS activities of organisational members (Kamalian et al., 2011). Rivera-Vazquez (2009) and von Krogh et al. (2012) both argued that the commitment of top management towards knowledge creation and sharing is a critical factor in the development of innovation.

7.10 Summary

This chapter has discussed the results of the study (quantitative and qualitative) according to the research questions and objectives and linked them to prior studies. The chapter covers the impacts of the four components of TL on product and process innovation through the mediating role of KS processes, and the differences between these impacts in public and private HEIs in Iraq. The results confirm those of previous studies regarding the mediating role played by KS in the TL-innovation relationship, which supports the reliability of the findings. In the second stage the study conducting interviews with the leaders regarding the differences in the TL practice and affect relationships across public and private sectors, the qualitative results show differences in the organisational characteristics (strategies) used to stimulate KS and innovation among the teaching staff at public and private HEIs in Iraq, with the relationships between the variables correspondingly stronger in the public than the private HEIs. The main conclusions and recommendations for the policy maker in the MOHESR are presented in the next chapter

CHAPTER EIGHT: CONCLUSIONS AND IMPLICATIONS

8.1 Introduction

This the final chapter in the study. The main objective of this thesis was to examine the impact of TL on innovation through the mediating role of KS in public and private HEIs in Iraq. Examining such relationships within HE sector was important in order to enhance the course-teaching and problem-solving abilities of these institutions. Chapter 1-7 presented the objectives of the study, a literature review, conceptual framework, the system of the HE in Iraq, research design, data collections and analysis (quantitative and qualitative) and discussion the findings.

This chapter summarises the main findings of the study, revealed through the quantitative and qualitative approaches, and presents an overview of the study. The implications for theory and practice are discussed. Then, recommendations are made for the policy makers at MOHESR, concerning TL practice and the development of effective strategies to promote a KS culture within HEIs for the enhancement of product and process innovation. Finally, limitations and future research ideas are presented.

8.2 Conclusions

This study aimed to examine the impact of TL on innovation through the mediating role of KS, and the differences between Iraq's public and private HEIs in these relationships. The study developed a model consisting of three constructs: TL, KS and innovation. KS within academic environments is considered to be a building block of efficient performance and it plays a key role in enhancing innovation in universities. It is the foundation of learning and research in HEIs and a vital pillar of KM that is critical to academic performance.

TL, on the other hand, generates commitment from teaching staff, and produces a greater quality of work and more creative problem solving. It has the ability to change values and create a culture with a shared vision. The specific problem addressed by this study was the lack of models developed to investigate the links between TL, KS and innovation within HEIs in developing countries, particularly Iraq.

This study examined the proposed model using a mixed-methods methodology as discussed in chapter five. Employing SEM, the study found that KS plays a pivotal role in the TL-innovation relationship, and that TL would be ideal in an educational context as it would promote KS activities and influence product and process innovation. Although there are many styles of leadership that universities can choose, this study provides guidance as to which would be most effective. TL would be ideal in an educational context by promoting KS and influencing innovation of teaching staff. Furthermore, in line with the knowledge based-view, the findings indicate that KS is an antecedent of innovation and a source of competitive advantage as it converts the tacit knowledge embedded in teaching staff into explicit knowledge, through their interaction within and outside their departments and universities/institutes. The study has further revealed that there are differences across sectors regarding TL practice, and in the pattern of the relationships between TL, KS, and innovation as seen in chapter sixth.

A sequential explanatory strategy was used in this study, consisting of two stages: quantitative and qualitative. In the quantitative stage, the study used a self-administered questionnaire comprising 32 closed-ended questions, 16 on TL, 8 on KS, and 8 on innovation, to collect data from 253 public-sector and 233 private-sector teaching staff, and to test the causal relationships between TL, KS, and innovation and their differences. In the qualitative stage, personal interviews were conducted face-to-face and by telephone, with the leaders of five public and five private HEIs to explain the unexpected results from the quantitative phase.

CFA and MCFA confirmed the measurement model across the group and indicated that the model fitted the sample data. SEM with AMOS 20 was used to test hypotheses H1 (a-h), H2 (a-d), H3 (a-b), and H4, which conceptualised the causal relationships between TL, KS, and innovation. It was found that TL positively influences product and process innovation and KS, and KS have impact on product and process innovation. Furthermore, the findings found that TL impacted on innovation through the mediating effect of KS, such findings indicate the Q1, Q2, Q3, and Q4 are answered. Meaning that TL, through idealised influence, inspirational motivation, intellectual stimulation and individualised consideration promotes and encourages a KS culture among teaching staff, which in turn develops product and process innovation in public and private HEIs in Iraq. Thus, the objectives one to four have been met.

Multi-group SEM was used to test hypotheses H5, H6, H7, and H8 regarding the differences in TL practice and the effect relationships between TL, KS, and innovation across the sectors. The results reveal differences between public and private HEIs in terms of their TL practice across sectors. The interviews with HEI leaders, analysed using NVivo 9 as discussed in chapter seven, add weight to the findings, and further explain the unexpected results from the survey, which answer Q5.

The findings quantitatively and qualitatively show that there are similarities between public and private HEIs in idealised influence and intellectual stimulation. The leaders in both sectors enjoy the trust and respect of their teaching staff due to their communication style. They show pride in their members of staff by being attentive. Furthermore, they are innovative and flexible regarding teaching methods and administrative issues. They show divergent thinking in using brainstorming and discussion. In respect to inspirational motivation and individualised consideration, both the quantitative and qualitative results show differences between the two groups. Public HEIs prefer to practise individualised

consideration and that practise increases product and process innovation. When the leaders listen to the ideas of their members of staff, and are involved in a continuous process of coaching, it is likely that new approaches will be explored, which could enhance innovation. Meanwhile, in the private education sector, inspirational motivation was found to be the strongest component affecting innovation, indicating that the more such college leaders communicate, the higher will be the product and process innovation, thus objective 5 has been met.

Additionally, the results from the interviews revealed new themes regarding the differences in the effect relationships between the two sectors. They indicated that TL enhances innovation in both sectors and that the relationships are stronger in the public than in the private HEIs in Iraq, because public universities provide job security, and more benefits for their staff, which results in greater staff commitment. Public HEIs also have a budget for innovation and are more independent in terms of their academic work. Demonstrating these findings helps to answer Q6.

Regarding the differences in the impact of TL on KS, the qualitative findings reveal that incentives, performance appraisals, physical environment, and time allocation are helpful if HEIs are to practise KS and develop products and processes, across the two sectors, by revealing this Q7 are answered.

Finally, the qualitative results also demonstrate that reward systems, top management support and training, and management commitment are imperative for KS and innovation in both sectors, which answers Q8. The findings of the study are illustrated in Table 37; it shows the key differences between the public and private HEIs in Iraq.

As a result, it was hoped that this study would fill some of the research gaps by providing empirical, theoretical, and methodological insights from an academic perspective, and by

testing theories (TL, KS, and innovation) in a non-Western setting. Furthermore, it aimed to help develop strategies regarding the promotion of a KS culture in Iraqi HEIs that could help the institutions to achieve better innovation and meet the expectations of MOHESR's planned strategy. The implications and contribution of the study will be shown in the next section.

Table 37: Summary the findings of quantitative and qualitative stages

Hypothesis		Stage of analysis	Results	Key themes
H1	H1a	1-quantitative - SEM	Positive influence of idealised influence on product innovation	--------
	H1b	1-quantitative - SEM	Positive influence of inspirational motivation on product innovation	--------
	H1c	1-quantitative - SEM	Positive influence of intellectual stimulation on product innovation	--------
	H1d	1-quantitative - SEM	Positive influence of individualised consideration on product innovation	--------
	H1e	1-quantitative - SEM	Positive influence of idealised influence on process innovation	--------
	H1f	1-quantitative - SEM	Positive influence of inspirational motivation on process innovation	--------
	H1g	1-quantitative - SEM	Positive influence of intellectual stimulation on process innovation	-------
	H1h	1-quantitative - SEM	Positive influence of individualised consideration on process innovation	--------
H2	H2a	1-quantitative - SEM	Positive influence of idealised influence on KS	--------
	H2b	1-quantitative - SEM	Positive influence of inspirational motivation on KS	-------
	H2c	1-quantitative - SEM	Positive influence of intellectual stimulation on	-------

			KS	
	H2d	1-quantitative - SEM	Positive influence of individualised consideration on KS	-------
H3	H3a	1-quantitative - SEM	Positive influence of KS on product innovation	-------
	H3b	1-quantitative - SEM	Positive influence of KS on process innovation	--------
H4	H4	1-quantitative - SEM	Positive mediating of KS between TL-innovation relationship	------
H5	H5a	1-quantitative - MSEM	No difference between public and private HEIs in idealised influence practice	-------
		2-qualitative- NVivo 9	No difference between public and private HEIs in idealised influence practice	Leaders in both public and private colleges have (trust, respect, proud, pride, and vision, risk-sharing).
	H5b	1-quantitative - MSEM	There are differences between public and private HEIs in inspirational motivation practice	------
		2-qualitative- NVivo 9	There are differences between public and private HEIs in inspirational motivation practice	The leaders from the private colleges tend to practise inspirational motivation more than public universities this includes (team spirit, communication, enthusiasm, and shared vision)
	H5c	1-quantitative - MSEM	No difference between public and private HEIs in intellectual stimulation practice	-------
		2-qualitative- NVivo 9	No difference between public and private HEIs in intellectual stimulation practice	Leaders in both sectors encourage teaching staff to (rethinking, sharing information, different views, new opinions, new approaches, and problem solving)
	H5d	1-quantitative - MSEM	There are differences between public and private HEIs in individualised	------

			consideration practice	
		2-qualitative-NVivo 9	There are differences between public and private HEIs in individualised consideration practice	The public HEIs' leaders prefer to practise individualised consideration and improve relations with their members of staff, coaching and counselling, listening, support, develop and helpful them
H6	H6	1-quantitative - MSEM	There are differences between public and private HEIs in the impact of TL on innovation	-----
		2-qualitative-NVivo 9	There are differences between public and private HEIs in the impact of TL on innovation	Public HEIs provide job security, and more benefits for their staff, which results in greater staff commitment. They also have a budget for innovation, competitive criteria in the selection of academic leaders, and autonomy in their work
H7	H7	1-quantitative - MSEM	There are differences between public and private HEIs in the impact of TL on KS	
		2-qualitative-NVivo 9	There are differences between public and private HEIs in the impact of TL on KS	Public HEIs provide reward systems, performance appraisal, physical work environment and internet and time allocation
H8	H8	1-quantitative - MSEM	There are differences between public and private HEIs in the impact of KS on innovation	
		2-qualitative-NVivo 9	There are differences between public and private HEIs in the impact of KS on innovation	Public HEIs provide rewards systems and recognition to encourage KS among teaching staff, care of scientists, top management support and learning, and management commitment.

8.3 Implications of the study

8.3.1 Implications for theory

The contribution to knowledge is twofold, relating to both theory and methodology. This study examined the impact of TL on innovation through the mediating role of KS, and the differences between private and public HEIs in Iraq. The results are significant and contribute to the theory on this subject.

From the theoretical perspective, the study provides and advances several contributions to the literature: firstly, it provides information about the relationship between TL and innovation by applying it to a new setting, namely to the study of product and process innovation in the HE sector, unlike previous studies that focused either on product (Du Plessis, 2007, Abu Bakar and Ahmad, 2010, Jimenez and Vall, 2011, Bohlmann et al., 2013) or process innovation (Frishammar et al., 2012). These relations have not, to date, been studied in a HE environment, particularly in developing countries like Iraq. TL is known to stimulate strong effects via a variety of initiatives that raise followers' awareness of other group members' contributions (Betroci, 2009, Bass and Riggio, 2012). Such leaders have the ability to enhance followers' confidence, effectiveness and motivation by attending to their personal needs and aspirations (Northouse, 2007, DuBrin, 2012). The results of the current study confirm that the four components of TL (idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration) do influence product and process innovation, and help to provide a better understanding of the inter-linkage between TL and innovation. This is important because it demonstrates that aspects of TL have impacts on the generation of capabilities that are not developed under the traditional leadership style. The latter focuses on a top-down culture that hinders the development of product and process innovation.

Secondly, the study strengthens and supports the link between TL and KS among teaching staff, showing that TL provides support, vision, encouragement, and trust, and promotes a KS culture. This gives an indication as to the most important factors that influence KS and provides a clue regarding how HEIs can promote KS activities. Through the analysis of the effects found, and via in-depth interviews with Iraqi leaders in HE, this study has clarified specific aspects of TL (idealised influence, inspirational motivation, intellectual stimulation and individualised consideration) and their impacts on the donation and collection of knowledge by members of staff. This information can provide leaders with ideas about the style of behaviour they can use to promote KS among their teaching staff, unlike previous studies (Nguyen and Mohamed, 2011, Shih et al., 2012, Analoui et al., 2013) that did not identify specific TL behaviours and their effects on KS as they studied TL as a single factor, and moreover were not carried out in a HE context.

Thirdly, this study has addressed the call of Subramaniam and Youndt (2005), to further examine the practical difficulties of using KS to enhance innovation within developing countries (Zwain et al., 2011). This study provides support for the knowledge-based view and empirically strengthens the role KS plays in enhancing product and process innovation in Iraqi HEIs. These results give us a better understanding of how knowledge can lead to competitive advantage in HEIs. KS is known to transfer individual experiences, knowledge, skills, expertise and information into explicit and organisational assets for better innovation (Nonaka and Toyama, 2005, von Krogh et al., 2012). Managing knowledge and sharing it, as a strategic resource is one of the foundational weapons that enable universities to increase their competitive advantage and chances of survival. Further, the study gives us more information about which type of innovation is most affected by KS processes, which is important for leaders wanting to put in place strategies to stimulate innovation within their HEIs. Knowledge donating and collecting in the education industry context has not been

studied before now. Hence, this study evaluates Hooff and Weenen's (2004) model of these two variables and provides the first hint as to how knowledge is shared in this industry.

Fourthly, the most significant contribution of this study relates to the mediating effect of KS processes on the relationship between TL and innovation. This supports previous studies (Liao, 2006, Lin, 2007) that asserted that KS processes are the key factors to success in organisations. This means that innovation will emerge if HEIs in Iraq can encourage and create a KS culture among their teaching staff in these knowledge-intensive institutions. Hence, the results contribute significantly to the literature on KS's support for the relationship between TL and innovation (develop a model) and provide a better understanding of these relationships in the educational environment within developing countries, specifically Iraq a context that has been neglected in previous studies. Further, this study contributes to the literature empirically, by incorporating concepts from TL theory and the knowledge-based view.

Fifthly, although recent studies have looked at TL's effects on innovation (Morales et al., 2011, Chen et al., 2012), on KS (Al-adaileh, 2011, Humayun and Gang, 2013), and KS's effects on innovation (Andreeva and Kianto, 2011, Wang and Wang, 2012) in isolation, they have been limited in terms of studying sectoral differences. This study extends their scope to the context of HEIs, including both public and private institutions in Iraq. Additionally, by identifying the prevalence of certain types of support policies in public and private institutions, this study provides comparative information about the relationships between TL, KS, and innovation. This extends the knowledge about these relations in both sectors.

The results indicate that TL enhances innovation and promote a KS culture among teaching staff in both sectors, but that the relationships are stronger in the Iraqi public sector than the private sector, because public HEIs provide job security, and more benefits for their staff,

which result in greater staff commitment. Iraqi public universities have a budget for innovation and KS, and are more independent in terms of academic work and incentives. This goes against the prevailing view of public sector institutions as conservative and shunning innovation. Additionally, it highlights the role that a secure environment without fear of criticism plays in encouraging academic innovation.

Additionally, this study reveals that leadership and KS are not enough to produce and enhance product and process innovation within Iraqi HE environment, even under TL. It indicates that the organisational context, including, such aspects as incentives, performance, and physical environment are important in the TL–KS relation, while transitional elements such as top management support, commitment training and learning are necessary to the KS-innovation relationship in both sectors. It further demonstrates sector-based differences, and similarities in terms of the TL exhibited, and gives a clearer picture of the status of the HEI system in Iraq. Although past literature, describes the public HEI system as one that follows a directive and authoritative, or bureaucratic, leadership style (Morshidi, 2006), the results of the current study provide some evidence that the leaders of HEIs in both sectors in Iraq are already moving towards a TL style, which adds value to the TL theory in the context of HE sector. Furthermore, the results show that there are significant differences across sectors in terms of TL practise. The public sector favours individualised relationships and consideration, while the private sector leaders tend towards inspirational motivation. This insight will be useful for supporting the types of strategies that each sector might use to enhance innovation.

Sixthly, the findings of the current study extend and confirm the universality of TL theory and its effects across cultures (Bass, 1985), by taking Iraq as a case study of a developing country within which to examine the impact of TL on innovation through the mediating role of KS. The findings indicate that, regardless of whether we are looking at a western or an

eastern context, TL plays a significant role in promoting a KS culture and enhancing both product and process innovation in both private and public HEIs in Iraq.

From a methodological perspective, this study supports and achieves validity and reliability for the constructs that measure TL, KS and innovation in a new geographical area. This gives a greater accuracy to the results in Iraqi HEIs and provides a valuable example of a methodology that researchers and academics might use to track the extent of TL, and KS and their effects on product and process innovation in other similar research. By using a mixed-methods approach, this study shows that qualitative data regarding the differences in TL practices and the effect relationships among TL, KS and innovation are useful for understanding quantitative findings and are an effective way to answer the questions of a study such as this.

8.3.2 Implications for practice

This study has implications for academic and policy makers in public and private HEIs and also covers the final objective of the study. Clarifying the style of TL that contributes to enhanced innovation could help leaders to devise strategies aimed at fostering more commitment to both product and process innovation. To underpin this culture in the HE environment, leaders in both public and private HEIs in Iraq need to be aware of the importance of effective staff processes, and place more emphasis on work relationships. A greater focus on building team spirit by fostering collaboration between staff and providing support to these networks is a necessity. A vision-based and individualised leadership using idealised influence and intellectual stimulation will encourage idea generation and stimulate members of staff to be more innovative.

The results of the current study illustrate the importance of TL in public and private universities in Iraq for encouraging product and process innovation. Therefore, universities

should foster the presence of transformational leaders as a way to focus efforts on the development of their teaching staff. This focus will in turn give a clear direction and purpose to the staff, establishing an environment of mutual trust and respect. Human resources are the most important assets for these leaders. Thus, they should inspire their staff to engage in product and process innovation, by motivating them to look for new training programmes, attend courses, take on research projects, and adopt new technologies.

For the Iraqi public HEIs, the results indicate that individualised consideration is the most significant predictor of product and process innovation. Therefore, leaders in that sector should provide support, encouragement, consideration, and coaching to members of staff. In contrast, in the private sector, inspirational motivation was found to be the strongest predictor of innovation. Thus, its leaders should articulate a stimulating vision of the future and attempt to motivate teaching staff to work towards this vision.

The study found TL to be essential to the practice of KS among teaching staff within HEIs in both sectors. Transformational leaders have the ability to create a culture of trust and affective commitment that is necessary for members to be willing to overcome their natural resistance to sharing what they know. Such leaders can stimulate the faculty to practise KS activities by encouraging them to establish sessions, lectures, workshops, and other formal and informal means of communication in order to share and exchange their learning and experiences. In addition, leaders who build positive relationships with their followers are able to foster their staff members' willingness to share their knowledge with other members of the institute. Therefore, the creation of a successful KS climate depends on the presence of TL. This study has further revealed that intellectual stimulation is the strongest predictor for the practising of KS in both sectors. Thus, leaders in Iraqi HE should create opportunities that encourage discussions and the sharing of knowledge among teaching staff by seeking new

approaches regarding teaching materials, and skills through brainstorming, regular meetings and seminars within and outside departments and colleges.

Additionally, the leaders of HEIs in Iraq need to be aware of and recognise the importance of KS and put more effort into building up effective KS mechanisms to promote ideas for product and process innovation. Previous studies have suggested that TL can be developed by focusing on training programmes (Chen et al., 2012). Hence, universities in Iraq should implement TL courses through which leaders can learn how to effectively encourage and intellectually stimulate their members of staff.

The important role of KS as a mediator variable in the TL-innovation relationship implies that the leaders in Iraqi universities need to expend effort on promoting KS practice. The findings of this study show that innovation requires members of staff to generate and share new knowledge. Therefore, leaders should design strategies aimed at encouraging their teaching staff to engage in KS activities such as sessions, conferences, workshops, etc.

It has been detected in this study that job security, an annual budget for innovation, autonomy and decentralisation all play important roles in the TL–innovation relationship. Therefore, leaders in both sectors should focus on these aspects and provide a nurturing and supportive climate for their academic staff.

Furthermore, the qualitative findings uncover that organisational context can strengthen the relationship between TL and KS. It shows that incentives, performance appraisals, physical environment, and adequate time allocations are all necessary elements. Incentives can help to determine knowledge flow, access, and sharing of existing knowledge, and the generation of new knowledge. They increase the communication among all departments on the campus and facilitate the collection and delivery of knowledge within and outside of departments. Thus, leaders, as the decision makers in Iraqi HEIs, should establish appropriate systems of rewards

such as bonuses and promotions. Such reward systems were identified as existing in public HEIs already but need to be promoted more in private colleges.

Recognising KS activities in performance appraisals could help to reduce the perceived cost of these activities. Leaders might also note that the adoption of this strategy could reduce the reluctance of teaching staff to spend time on KS by linking it directly to evaluation and reward. Performance appraisals can thus positively affect KS and make teaching staff more likely to see it as an integral part of their job responsibilities.

Leaders could also adopt strategies aimed at providing a suitable work climate and physical environment for KS practice. It was found from the interviews that IT, equipment, buildings, and maintenance budgets all facilitate and promote KS activities between those who collect knowledge and those who control the access to it. The current physical structures of most public and private HEIs in Iraq need more support.

This study also found that making time for KS is pivotal to developing a KS culture within and outside departments. Indeed, time allocation is essential for members of staff to share their new learning or collaborate with others. Time allocated to formal activities is necessary for purposive learning channels such as training and teamwork. This enables faculty member to make contact with their colleagues and share their experiences, skills, knowledge, reports, and publications throughout their university or institute. On the other hand, taking time for informal activities such as personal relationships and social communities can facilitate knowledge learning and develop respect, trust, and friendship among staff, which are the core elements of KS. Hence, HEIs in both sectors need to make time for KS and adopt strategies that encourage social interaction and reflection on the effectiveness of meetings.

HEIs may set up strategies or channels through which to share knowledge to encourage more innovative product and process development, such as reward and recognition systems to

boost teaching staffs' active participation in the communication and exchange of their expertise, skills, experience, and knowledge through publications and research projects.

The findings suggest that leaders should pay special attention to training and learning orientations by which KS is most likely to enhance product and process innovation. It can help to build relationships that are vital for the sharing of knowledge, increase interaction, create a common language and build social ties. Training in communication skills should also be taken into account, as it can help teaching staff to exchange and share their information more effectively. Thus, leaders within Iraqi HEIs should encourage continuous learning activities and provide cross-functional training, establish conferences, sessions, workshops, social communities, and colloquies through which faculty members will be able to acquire multiple skills, and knowledge for better product and process innovation.

Transitional elements such as top management support and commitment should also be considered when promoting the teaching staff's KS initiatives for better innovation. As for all improvement and innovation programmes, support and commitment from top management is critical to any KS initiative.

8.4 General recommendations to the policy makers at MOHESR

On the basis of the findings, this study recommends that MOHESR should consider the following:

- Nurturing qualified and trained cadres who are fundamentally ready to possess leadership characteristics and qualities, also nurturing those with creative abilities to utilise such abilities
- Hold more training programmes, workshops, seminars and open meetings so as to exchange expertise with other sectors on a regular basis.

- Teaching in universities and institutions, especially in humanity colleges, must be in English because this will enhance the status of Iraq's university education in the world and will facilitate the securing of scholarships and grants.

- Utilising the creativity of outstanding university professors by adopting a policy of incentives, such as good payment packages, cash rewards, promotions to respectable positions, allowances to attend conferences or overseas temporary posts work travel, and specialised training courses, in addition to valuing their work and praising them publicly as this will increase their activity.

- Removing conventional pyramid organisational structures to ensure a flexible response to changes in the general environment. Also, exercising developmental authority so as to secure cultural agreements with equivalent colleges in the Arab world and in the West, and so exchange culture.

- Encouraging the leaders of HEIs to increase their scholarships, and study and research missions

- Encouraging administrators and teaching staff to harness the spirit of exchange, innovation, and renewal through the use of scientific criteria to measure present and future performance

- Adopting modern assessment tools for employees' performance and output

- Upgrading and improving the effectiveness of planning training programmes, making it responsive to the actual future needs of HEIs.

- Conducting an analytical study on the performance of scientific departments and evaluating performance levels by using modern assessment tools so as to outline strong and weak aspects, and to identify the opportunities and risks facing each department.

- Looking at excellence and proposals as investments, not as burdens on the ministry or the institution's budget, and providing the appropriate means and tools to guarantee successful adoption

- Strengthening contributions by private universities and colleges to ensure that their requirements are in line with the ministry's policies and directives as well as the needs of the job market. Private universities and colleges must seek complimentarity and not similarity in relation to specialties in the sciences and humanities in public universities.

8.5 Critique of research methodology

The researcher encountered some challenges in the course of conducting the study. This study was originally intended to be conducted in Iraq, but was in the end conducted in Plymouth, UK. As a researcher, I had to switch my thinking to a new educational setting with different cultural, structural, and contextual components. Research undertaken in an unfamiliar environment places additional demands on the sensitivities of the researcher. Preparing the thesis introduced the researcher to the notions of leadership style, knowledge sharing and innovation within higher education. These factors have been identified in numerous studies conducted across the developed world, whilst there has been much less research recognising these effects in developing countries, particularly Iraq. More research should be published in this area, as it is certainly a topic that would generate further discussion and ideas within the country.

This study has key strengths in its robust methodology/mixed methods and its strong theoretical foundation. The analytical aspect of the research gained rigour from the quantitative and qualitative blend of techniques, affording the research the twin advantages of thematic and statistical analysis. Furthermore, the comparative analysis between the private and public HEIs broadened the scope of the analysis and gave a clearer picture regarding the

status of the HE system in Iraq. However, the researcher feels that further research in other methodology would be advantageous, namely using the exploratory research method with an inductive approach in the first stage, based on the views of leaders in the HE sector, upon which the theory is generated, and the deductive approach in the second stage, where the theory is tested. One approach might be to explore other factors for promoting KS and stimulating product and process innovation among the teaching staff, rather than using TL alone. An alternative strategy, in particular (interpretivism) might offer, richer insight, although not necessarily better, than the adopted strategy in the current study as each gives rise to a particular way of seeing the world.

Throughout the research, the researcher encountered a new subject which is difficult to understand that a philosophy and a significant amount of time had to be spent on choosing the eventual philosophies taken namely positivism and interpretivism. Furthermore, the questionnaire used in this study was translated from English to Arabic using back-translation. While translating the questionnaire and the responses proved time-consuming, the major challenges encountered were associated with translating the findings of this research into more meaningful outcomes that would engender a culture of innovation.

The study made use of semi-structured interviews in the second stage to gain in-depth information about the results that arose from the quantitative analysis regarding the differences in TL practice and the different relationships among TL, KS and innovation in public and private HEIs in Iraq. However, the researcher encountered some difficulties in meeting with the leaders of these HEIs due to their busy schedules; this often resulted in either waiting for many hours or the postponement of interview appointments (face-to-face interviews). Furthermore, the telephone interview dates were changed several times, which meant that the interviews took much longer than anticipated. However, good relationships were maintained throughout the interactions, both before and after the interviews.

This thesis is the result of studing for a Ph.D and, through this process, the researcher has gained practical experience in research methods of which she had very little experience previously, for example some of the aspects of qualitative methods and data analysis using SEM and NVivo software. Hopefully, she will be able to contribute to the development and enhancement skills of the staff in the institute concerning these aspects. The knowledge and skills of the researcher today allow her to reflect on and critically identify her strengths and areas for improvement due to the experience she has gained throughout the research process. The researcher improved her skills in terms of thinking, writing, choosing research methods, problems solving, data analysis and evaluation, and data presentation. Moreover, she has learned much about field research in Iraq and acquired insights into the importance of interaction among people for effective and efficient results. The researcher also developed her English language skills, another challenge for her, by attending and participating in training programmes, seminars, workshops, and conferences, and writing to journals, and she is aware that this has only opened doors for further exploration and understands that the research process is not one of closing down all uncertainty but one that raises new questions, and that there is far more that she does not know.

The study develops a model linking TL, KS and innovation. The development of the model and reading more about TL, KS and innovation has not only allowed the researcher to gain a better understanding of the impact of the four components of TL on product and process innovation through the mediating role of KS, and the differences in TL practice and its effects between public and private HEIs in Iraq, but has also provided a clearer explanation of these factors for future researchers. In addition, the multiple challenges the researcher faced while working on this study have her made more persistent and persevering in endeavouring to complete the thesis. Hence, if she had the chance to do it again she would conduct a similar study on a longitudinal basis, which may provide a valuable means for different reflexive

richness. The researcher intends to keep working on new dimensions of these ideas, and believes this journey will never end.

8.6 Study limitations

Despite significant contributions to the body of knowledge on the relationships between TL, KS, and innovation and the differences in these relationships between public and private HEIs, this study has its limitations, as do all studies that offer an agenda for future research. Firstly, the study is limited in focusing on the TL style only, while this style is usually combined with transactional and laissez-faire leadership, according to Bass (1985). Thus, future research could explore the impacts of all three-leadership in an attempt to detect, which is the most influential on KS, product and process innovation among teaching staff.

The sample of this study was limited to the public and private HE sectors, and therefore the results cannot be generalised to other sectors. Further studies should explore such relationships further in other sectors such as industry, to examine whether the results of the current study are supported or not.

In terms of geographical area, the context was developing countries, specifically Iraq. Hence, the findings may not generalise to other countries, since cultural differences may lead to different influences (Hofstede et al., 2010). For further validity, the model could be extended to different cities, countries and cultures, and this may lead to different findings.

The study was limited to focusing on TL as an enabler for KS and innovation. However, it did not consider all enablers that are critical to KS, such as individual characteristics or organisational climate. Future research could study other factors. Further, this study examined the direct and medicating effects of KS on the relationship between TL and innovation, future research might examine the processes that moderate these relationships.

In terms of data collection in the quantitative stage, there may also be some limitations. This study employed delivery and data collection questionnaires. Although, it yielded response rate of (63.25%) in the public sector and (82.6%) in the private sector, multiple methods such as e-surveys or postal questionnaires might have contributed to a larger response rate. It is argued that the use of mixed methods of data collection by questionnaire provides an opportunity to compensate for the weaknesses of each method and can increase the response rate of the sample (Saunders et al., 2012).

Regarding the qualitative stage, the study was limited to the use of interviews for data collection. Although this method helped explain the findings from the quantitative stage and revealed new themes in the effect relationships and TL practices across public and private HE in Iraq, the use of focus groups might have helped to reveal more factors and could have cross-validated the findings. These limitations provide opportunities for further development of the subject in future studies.

8.7 Future research directions

A number of recommendations for additional research have been developed from the findings of this study. The model could be compared in two developing countries. This could contribute to the knowledge and provide new insights into the effect of TL on innovation through the mediating role of KS and the factors that affect these relationships in developing countries.

The measures of KS and innovation used in this study were developed from several previous studies. Although these studies have strong reliability and validity, and strong construct validity was obtained in this study, some variables showed low magnitude (less than 0.5) in the EFA and were omitted. Thus, future research could increase the number of items and test the constructs in a different environment for more robust results.

The study tested KS empirically as a mediator variable in the TL-innovation relationship as one dimension, in spite of the fact that factor analysis distinguished between knowledge donating and collecting. Hooff and Weenen (2004) also indicated that these KS processes (donating and collecting) have different effects. Hence, future research could further clarify which knowledge processes are more influential in enhancing product and process innovation in the education industry. Further analysis could be conducted at the institute or department level, for instance the effects of KD and KC on product and process innovation within and outside departments or institutes can be expected to differ.

This study looked for differences between public and private HEIs in Iraq. Although this distinction was useful for the purposes of this study in terms of understanding their systems, policies and procedures, future research should examine gender/and management style inter-relationships. Currently, a large number of institutions in the HE sector in Iraq are female dominated, and an analysis of this sort may produce different results.

KS can result in other outcomes that can lead to competitive advantage (Nonaka, 2005). Examining the impact of KS processes on other outcomes such as organisational learning, education quality, academic performance, and staff satisfaction would be interesting themes for future research.

Additionally, process innovation, as the dependent variable in this study, was studied as one dimension. According to Danmmpor et al. (2009), it can be divided into two elements, technological and administrative process, and each element has different effects. Thus, future research should look into which type of process innovation is more strongly influenced by TL and KS.

Based on a sample of 486 respondents, many significant findings have been gained. However, a larger sample would bring more statistical power and allow for more developed

statistical analysis. Furthermore, this study needs to be replicated with a much wider range of HEIs so that more insight can be gained.

Organisational elements such as decentralisation, commitment, reward systems, physical environment, top management support, and training were not included in the quantitative examination but were revealed as important factors in both sectors in the qualitative analysis. Future studies should therefore move beyond organisational climate measures in examining the relationships between TL, KS and innovation.

The qualitative findings reveal that time allocation is a critical element of KS success. So far, there is limited research in the KS literature to support this view, which offers another area for further research.

Lastly but not last, the literature review in Chapter 3 showed that few studies on KS and TL had been carried out either in the field of HE or in Arab countries. This calls for more research to be conducted in this area.

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APPENDICES

Appendix1. Survey questionnaire

Plymouth University
Cookworthy Building,
Drake Circus,
Plymouth,
Devon
PL4 8AA
UK

The Impact of Leadership style on Innovation in Iraq's Higher Education Institutions: The Role of knowledge sharing

Dear participant

I am a PhD student at Plymouth University, UK. This survey is a part of studying which aims to examine the impact of transformational leadership on innovation through mediating role of knowledge sharing in public and private Iraqi HEIs.

Transformational leadership (TL): is a process that increases institute effectiveness and performance of the teaching staff by transforming their personal value and self-concepts. This leadership includes four dimensions:

- ❖ **Idealised influence**: refers to that leader who expresses confidence in the institute vision and instils trust and respect among teaching staff.
- ❖ **Inspirational motivation**: means trying the leader to inspire their faculty by motivating them to become committed to the vision of the institute.
- ❖ **Intellectual stimulation**: refers to encourage the teaching staff to try new approaches and challenges existing assumptions.
- ❖ **Individualised consideration**: refers to that leader who builds personal relationships with their staff and pay special attention to their needs.

Knowledge sharing: refers to the process of donating and collecting knowledge, views, learning, and experiences regarding teaching career and administrative issues among teaching staff through formal and informal meetings, conferences, sessions--ect. within and outside department or university/institute.

Innovation in HEIs: refers to accepting, developing, and implanting new products (i.e. new courses, research projects, teaching materials, and curricula) and processes by developing and using new technology, good financial management and the continuous improvements of skills.

Your contribution is valuable and important for the success of research project. Your answers will be treated confidential and will not be exposed to anyone. The participants have the right to withdraw at any time research period and the data will be destroyed. If you have, questions or you are interesting in research findings. Please do not hesitate to contact me on the information below I will be happy to replay you --- Many thanks

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Section 1: Transformational leadership

Please answer the following question ranking each statement in the table below from 1 to 5.

(To what extent do you agree the following statements that can reflect TL in your department or institute/ University?).

Note:

Strongly disagree = 1, Disagree = 2, Neither agree nor disagree = 3, Agree = 4, Strongly agree = 5

No.	statement	SCALE				
		1	2	3	4	5
1	*Idealised influence* Acts in ways that build my respect					
2	Instils pride in being associated with him/ her					
3	Talks about his/ her important values and beliefs					
4	Goes beyond self-interest for the good of the group					
5	Considers the moral and ethical consequences of decisions					
6	Emphasises the importance of having a collective sense of mission					
7	Displays a sense of power and confidence					
8	*Inspirational motivation* Talks optimistically about the future					
9	Talks enthusiastically about what needs to be accomplished					
10	Articulates a compelling vision of the future					
11	Expresses confidence that goals will be achieved					
12	Develops a team attitude and spirit among members of staff					
13	*Intellectual stimulation* Re-examine critical assumptions to question whether they are appropriate					
14	Gets me to look at problems from many different angles					
15	Suggests new ways of looking at how to complete assignments					
16	Seeks different perspectives when solving problems					
17	Encourages me to rethink ideas that have never been questioned before					
18	*Individualised consideration* Spends time teaching and coaching					
19	Treats me as an individual rather than just as a member of a group					
20	Considers me as having different needs, abilities and aspirations to others					
21	Helps me to develop my strengths					

Section 2: Knowledge Sharing

(*To what extent do you agree the following statements that can reflect your practicing KS in your department or institute/University?*).

Note:

Strongly disagree = 1, Disagree = 2, Neither agree nor disagree = 3, Agree = 4, Strongly agree = 5

No.	Statements	SCALE				
		1	2	3	4	5
1	*knowledge Donating* Knowledge sharing with colleagues is considered normal outside of my department					
2	Knowledge sharing among colleagues is considered normal in my department					
3	When I have learned something new, I tell colleagues outside of my department about it					
4	When they have learned something new, my colleagues within my department tell me about it					
5	I share information about teaching profession with my colleagues in the University					
6	I share information about administrative issues with my colleagues in the University					
7	When I have learned something new regarding teaching profession, I tell my colleagues in my department about it					
8	When they have learned something new, colleagues outside of my department tell me about it					
9	*Knowledge collecting* I share information I have with colleagues within my department when they ask for it.					
10	Colleagues in my university share information about teaching profession with me					
11	Colleagues within my department share knowledge with me , when I ask them about it					
12	Colleagues within my department tell me what their skills are, when I ask them about it					
13	I share my skills with colleagues outside of my department, when they ask me to					
14	I share my skills with colleagues within my department, when they ask for it.					
15	I share information I have with colleagues outside of my department, when they ask me to					
16	Colleagues in my university share information about administrative issues with me					

Section 3: Innovation

(To what extent do you agree with the following statements that can assess developing and implementing process innovation in your University?)

Note:

Strongly disagree = 1, Disagree = 2, Neither agree nor disagree = 3, Agree = 4, Strongly agree = 5

No.	Statements	SCALE				
		1	2	3	4	5
1	*Product innovation* Our university is delivering new courses for members of staff					
2	Our university constantly emphasises development and doing research projects					
3	Our university often develops new teaching materials and methodologies					
4	Our university often develops new programmes/ services for members of staff and students					
5	Our university is extending its programmes/ services to new groups of employees not previously served by the university/institute					
6	*Process innovation* Our university is developing new training programmes for staff members					
7	Our university encourages teamwork and good working relationships between staff members					
8	Our university is implementing an incentive system (i.e. higher salaries, bonuses, --) to encourage members of staff to come up with innovative ideas					
9	Our university often develops new technology (internet, databases, ---) to improve the educational process					
10	Our university often uses new technology to improve the educational process					
11	New multimedia software is used by this university for educational purposes and administrative operations					
12	This university is implementing a reward system (i.e. promotions, thank----yous) to encourage members of staff to come up with innovative ideas					
13	Our university is trying to bring in new equipment (i.e. computers) to facilitate educational operations and work procedures					

Section 4: Personal Information

Please Tick the appropriate (√)

1 – Gender: **a)** Male ☐ b) Female ☐

2- Marital Status: a) Single ☐ c) Divorced ☐

  b) Married ☐ d) Widowed ☐

3 – Age: a) ≤ 25 years ☐ c) 40-49 ☐ e) ≥ 60 ☐

  b) 30-39 ☐ d) 50-59 ☐

4 –Tenure: a) <10 years ☐ c) 16-20 ☐ e) >26 ☐

  b) 11-15 ☐ d) 21-25 ☐

5 - Academic Qualifications:

  a) Bachelor's ☐ c) Master's ☐

  b) High diploma ☐ d) PhD ☐

6 - Academic position:

  a) Assistant Lecturer ☐ c) Assistant Professor ☐

  b) Lecturer ☐ d) Professor ☐

7-Type of the university: a) Public ☐ b) Private ☐

8 – University/Institute-College name --

Many Thanks for your Cooperation, and completing this form

Appendix 2: Reliability

Scale: TL, KS, and innovation

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.854	.858	50

Item-Total Statistics

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TL1	.328	.853
TL2	.477	.848
TL3	.553	.846
TL4	.448	.848
TL5	.348	.850
TL7	.510	.847
TL6	.439	.849
TL8	.535	.846
TL9	.375	.855
TL10	.357	.850
TL11	.355	.854
TL12	.562	.847
TL13	.340	.858
TL14	.326	.857
TL15	.322	.857
TL16	.308	.855
TL17	.365	.850
TL18	.394	.852
TL19	.393	.849
TL20	.318	.851
TL21	.575	.847
KS22	.209	.853
KS23	.301	.852
KS24	.568	.847
KS25	.412	.849
KS26	.354	.850
KS27	.394	.850
KS28	.411	.850
KS29	.481	.849
KS30	.490	.852
KS31	.547	.846
KS32	.500	.847
KS33	.508	.846
KS34	.497	.855
KS35	.382	.853
KS36	.368	.853
KS37	.498	.847
INN38	.552	.846
INN39	.426	.849
INN40	.357	.857
INN41	.488	.859
INN42	.412	.858
INN43	.383	.854
INN44	.308	.851
INN45	.395	.853
INN46	.304	.853
INN47	.356	.851
INN48	.553	.852
INN49	.628	.856
INN50	.735	.859

Scale: TL

Case Processing Summary

		N	%
Cases	Valid	46	100.0
	Excluded[a]	0	.0
	Total	46	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.824	.830	21

Item-Total Statistics

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TL1	.472	.834
TL2	.432	.815
TL3	.330	.825
TL4	.528	.810
TL5	.334	.819
TL6	.518	.813
TL7	.411	.816
TL8	.483	.812
TL9	.455	.822
TL10	.417	.816
TL11	.415	.817
TL12	.599	.808
TL13	.393	.821
TL14	.377	.818
TL15	.365	.818
TL16	.491	.813
TL17	.432	.815
TL18	.360	.819
TL19	.411	.816
TL20	.322	.822
TL21	.628	.807

Scale: KS

Case Processing Summary

		N	%
Cases	Valid	46	100.0
	Excluded[a]	0	.0
	Total	46	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.851	.859	16

Item-Total Statistics

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
KS22	.386	.847
KS23	.400	.846
KS24	.717	.831
KS25	.696	.830
KS26	.638	.834
KS27	.562	.838
KS28	.642	.835
KS29	.572	.838
KS30	.366	.849
KS31	.578	.837
KS32	.421	.846
KS33	.371	.852
KS34	.448	.855
KS35	.366	.848
KS36	.372	.847
KS37	.391	.847

Scale: innovation

Case Processing Summary

		N	%
Cases	Valid	46	100.0
	Excluded[a]	0	.0
	Total	46	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.729	.730	13

Item-Total Statistics

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
INN38	.432	.755
INN39	.436	.735
INN40	.514	.690
INN41	.467	.698
INN42	.528	.688
INN43	.599	.682
INN44	.588	.683
INN45	.517	.692
INN46	.305	.727
INN47	.374	.721
INN48	.355	.723
INN49	.361	.726
INN50	.361	.726

Appendix 3: Interviews

The Impact of Leadership style on Innovation in Iraq's Higher Education Institutions: The Role of knowledge sharing

This interview with the leaders in public and private HEIs in Iraq, it aims to explain the unexpected results from quantitative stage. It reflect better understanding about the practice of TL and the strategies used by them to increase KS activities and enhance product and process innovation in each sector. The data that collected from the interviewee will be used for scientific research only and no involvement of names of individuals or college/institute.

1 – What are the most significant TL strategies that you use to transform the members of staff in your university?
- Do you think your teaching staff trust you? Please, explain how?
- Do you think your members of staff have confidence in you? Can you give an example, please?
- Are you proud of your academic staff? Can you please explain, or give examples regarding that?
- How do you motivate your members of staff to achieve the vision and goals of your department or university? Give examples, please.
- Do you use strategies to stimulate your academic staff so as to challenge them and encourage them to use new ways of teaching? How?
- Do you assist your teaching staff individually? Can you please explain how?
- How do you coach and mentor your staff?

2–In your opinion, are there factors that affect the relationship between TL and innovation in your university? Could you please name some of these factors?

3- Do you use strategies to motivate teaching staff to practice knowledge sharing? How?

4 - What the strategies used by you to motivate the faculty for innovation in terms of product and process?

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Appendix 4: Personal Information of leaders and coding

No.	Academic Qualifications	Gender		Tenure in the current position	Leadership position in the university/ institute	Academic position	Code
		Male	Female				
1	*Public* PhD	√		4 years	Head of department	Assistant professor	HD3
2	Master		√	3 years	Head of department	Lecturer	HD2
3	PhD	√		3 years	Dean	Assistant professor	D1
4	PhD	√		5 years	Deputy of Dean	Professor	DD2
5	PhD	√		2 years	Head of department	Assistant professor	HD5
	Private						
1	PhD	√		10 years	Head of department	Assistant professor	HD2
2	PhD	√		5 years	Head of department	Lecture	HD3
3	PhD	√		4 years	Head of department	Assistant professor	HD4
4	PhD	√		8 years	Deputy of dean	Assistant professor	DD1
5	PhD	√		3 years	Head of department	Lecture	HD5

Appendix 5: First order of the measurement model

First order of the measurment model of TL-public(253)
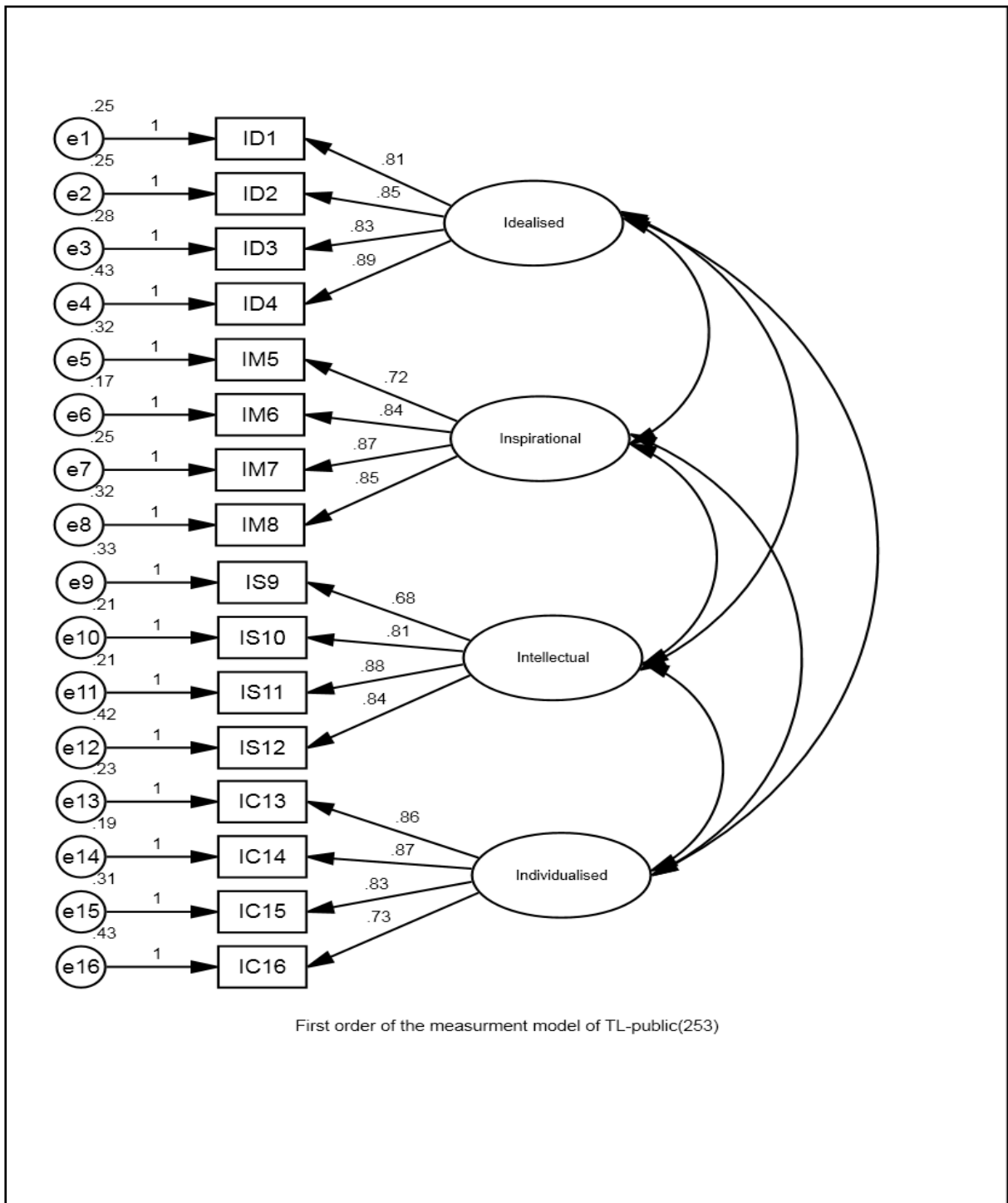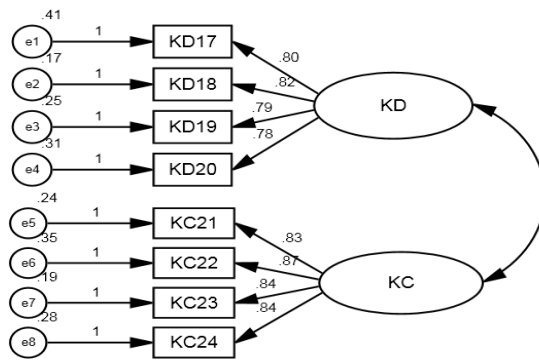
First order of the measurement model of KS-public(253)
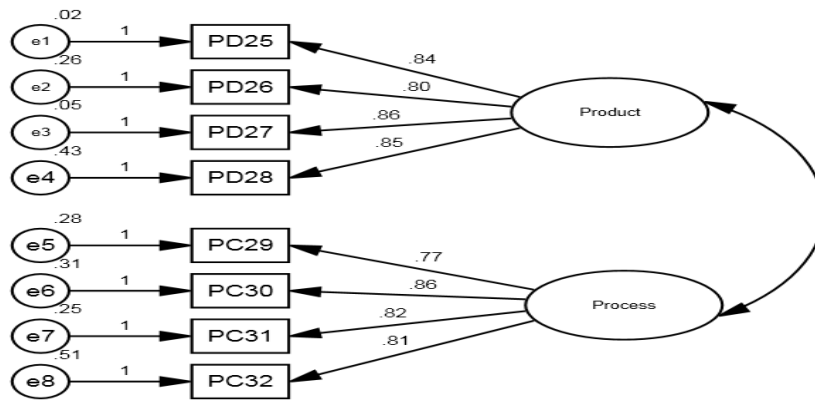
First order of the measurement model of innovation-public (253)
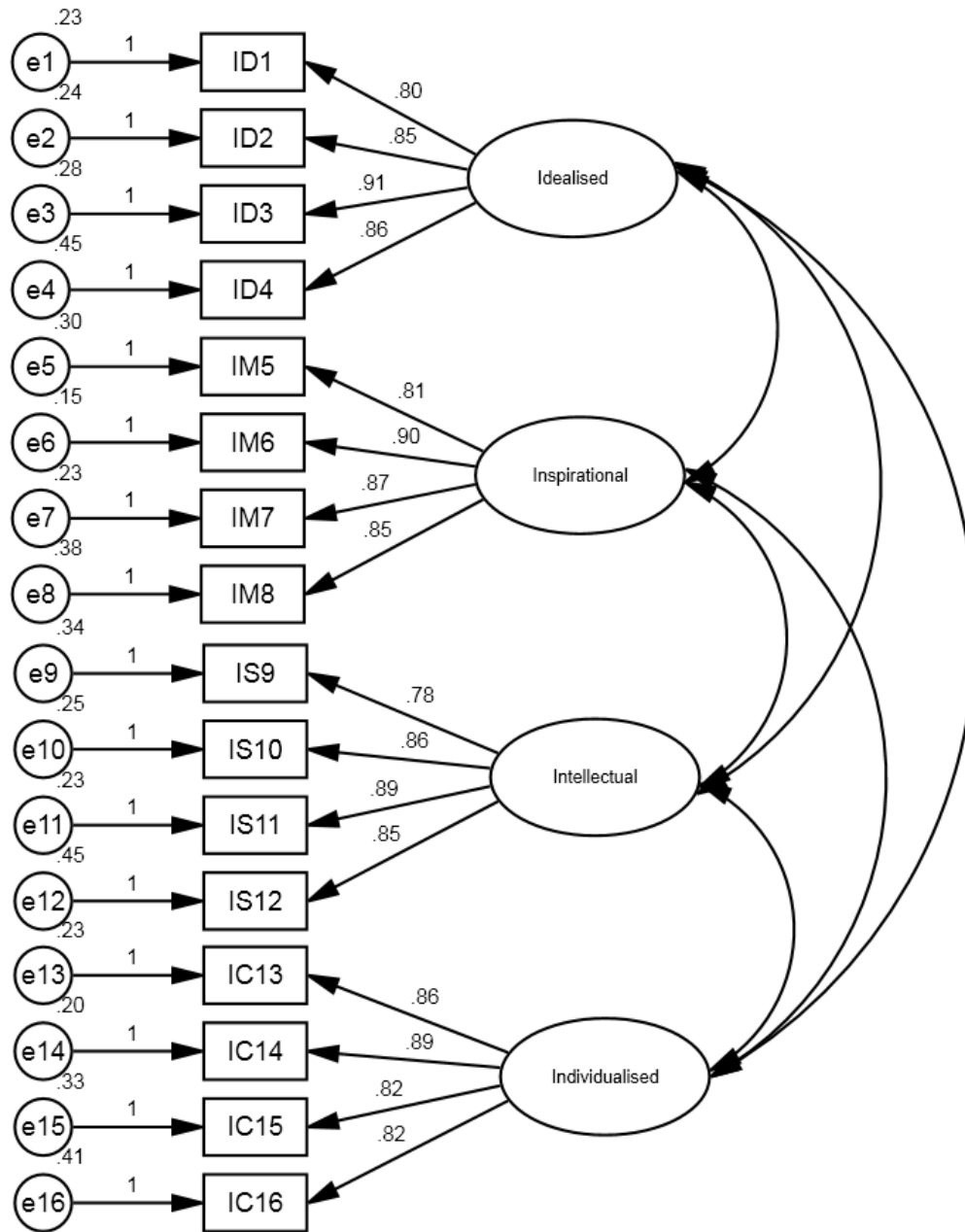
First order of the measurement model of TL-private(233)
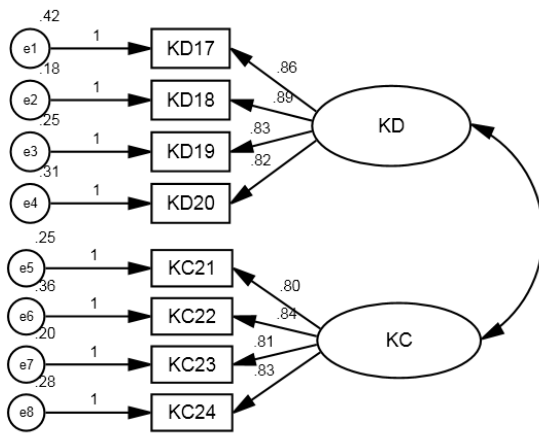
First order of the measurement model of KS-private(233)
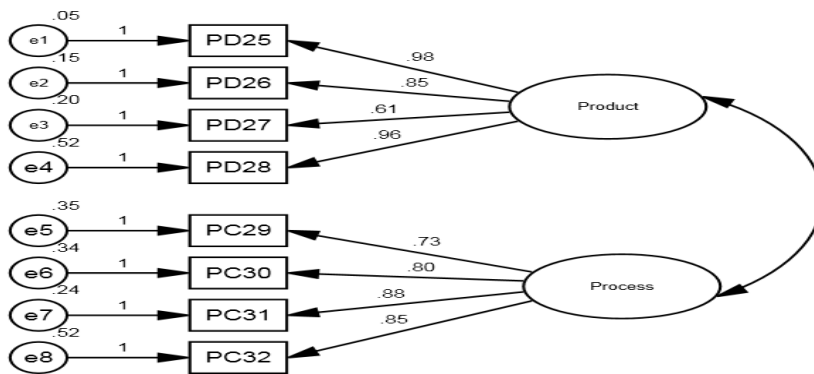
First order of the measurement model of innovation-private (233)
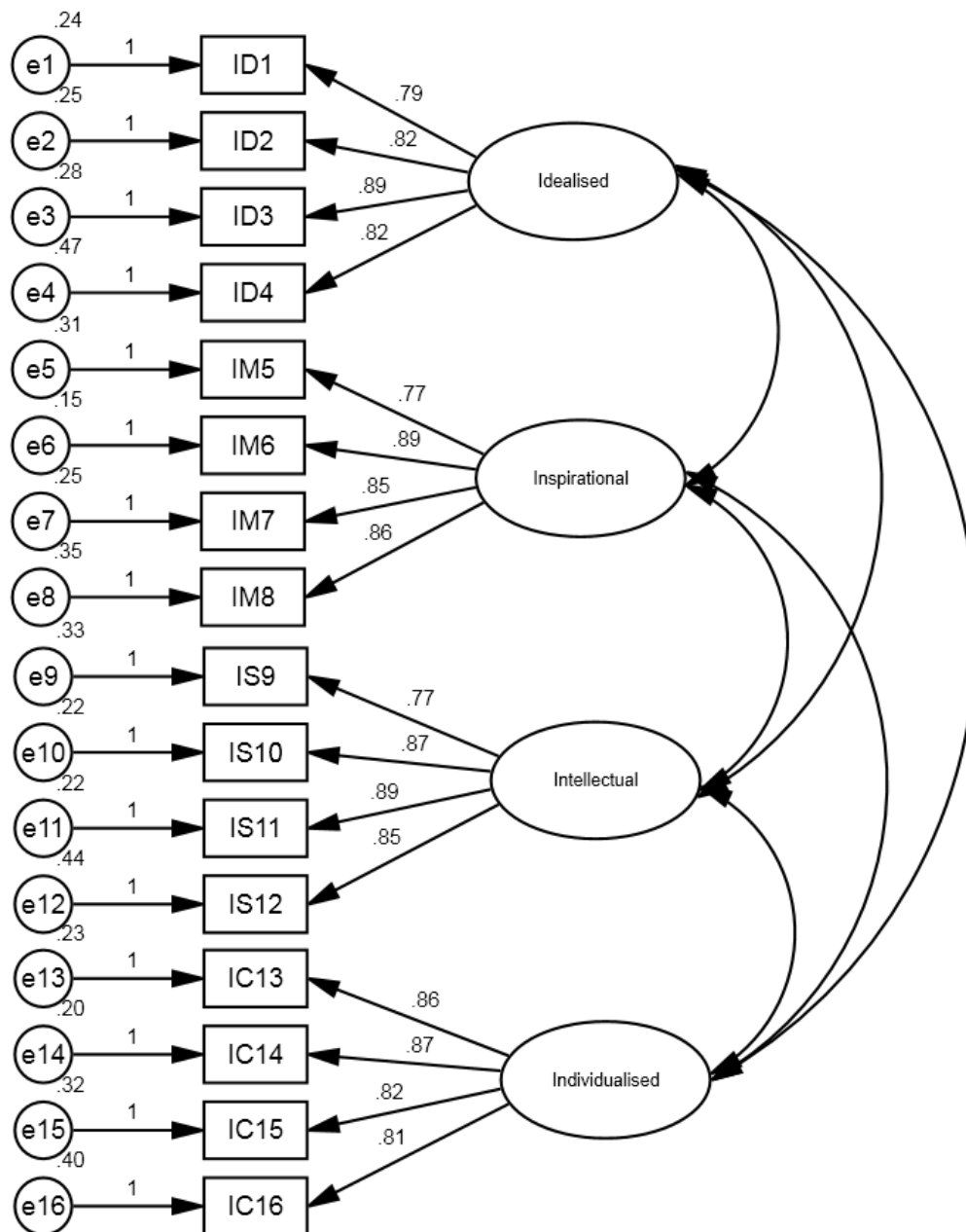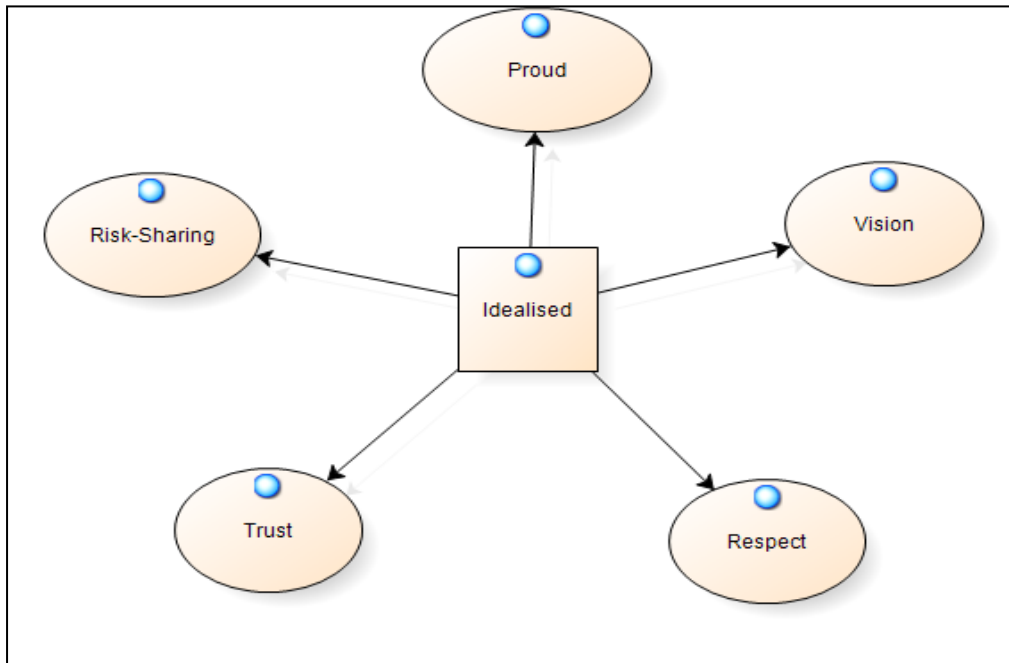
MCFA- first order of the TL dimensions (N=486)
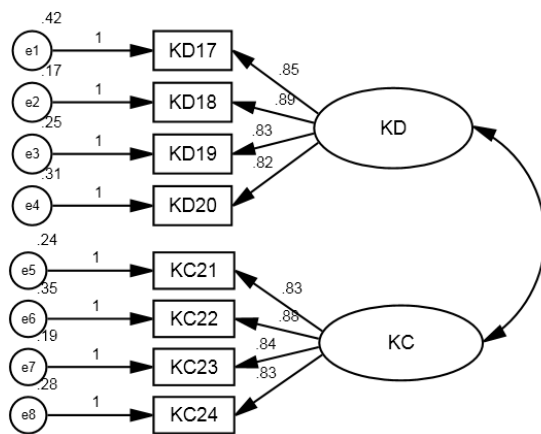
MCFA- first order of the KS (N=486)
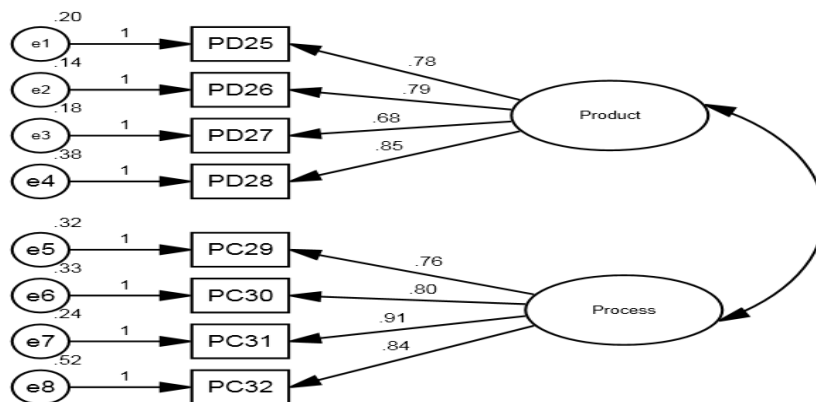
MCFA-first order of the Innovation (N=486)

Appendix 6: NVivo output of TL practice in public and private HEIs

1. Idealised- public

Idealised - private
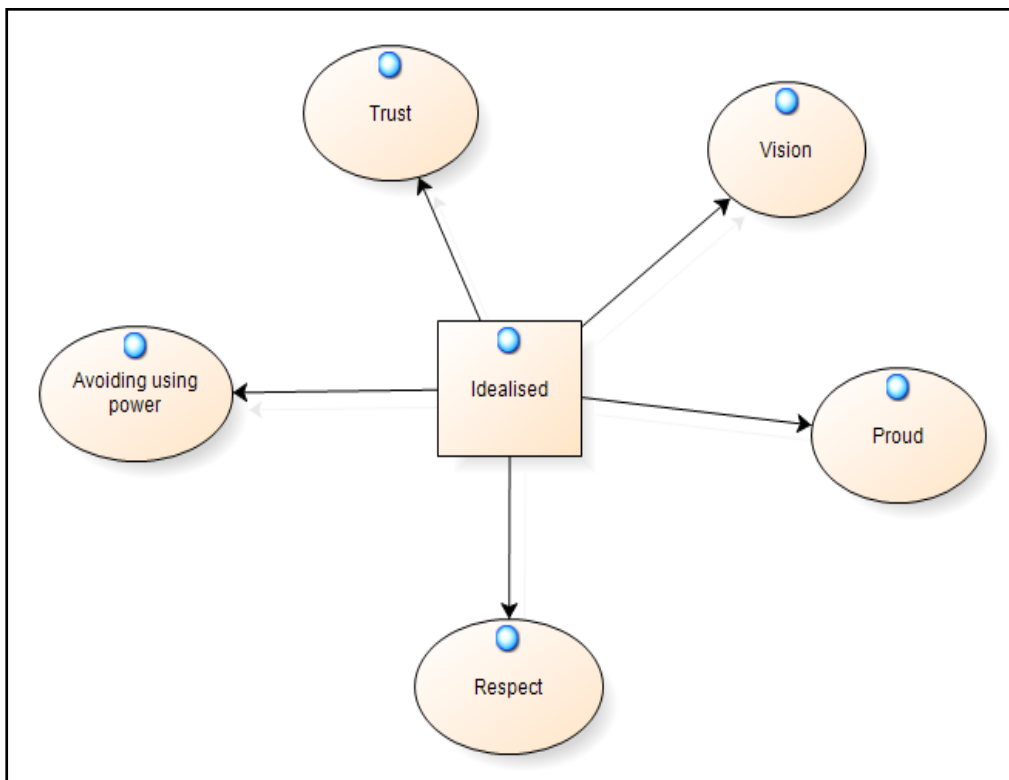
2 . Intellectual- public
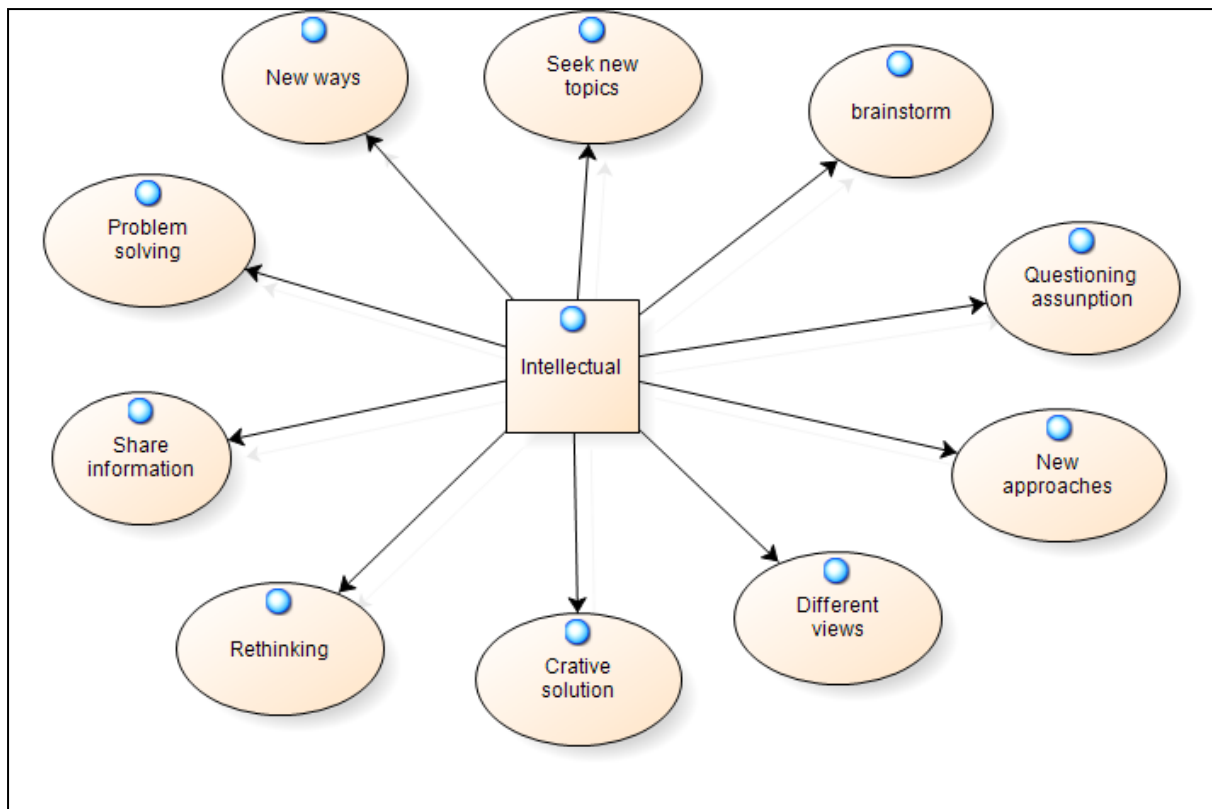
Intellectual -private
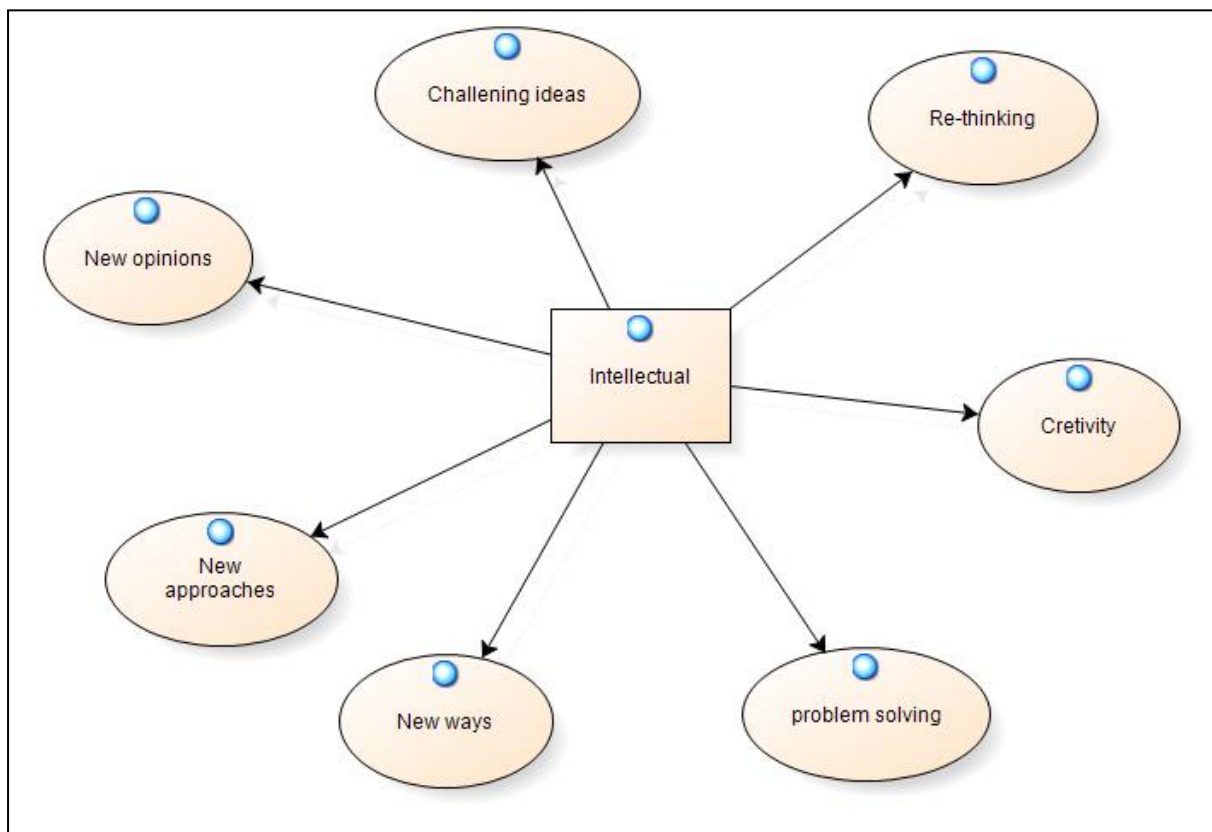
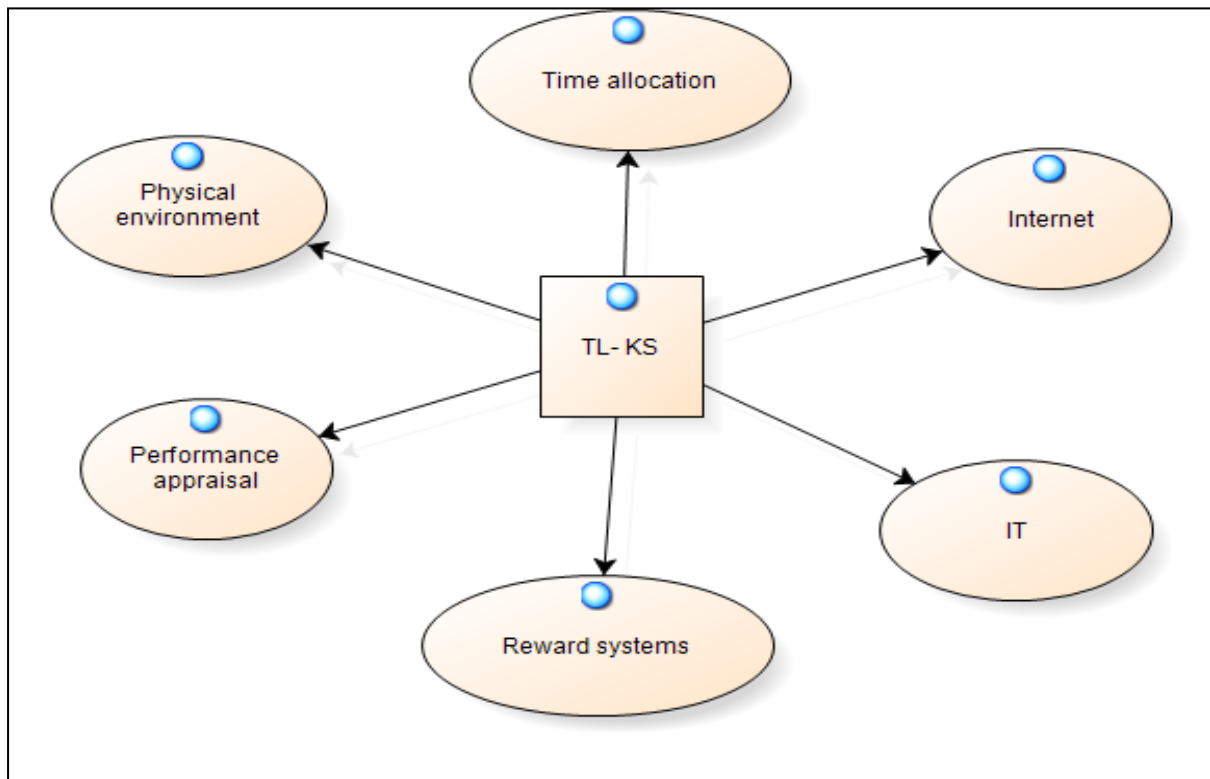**3. Inspirational -private**

4. Individualised - public
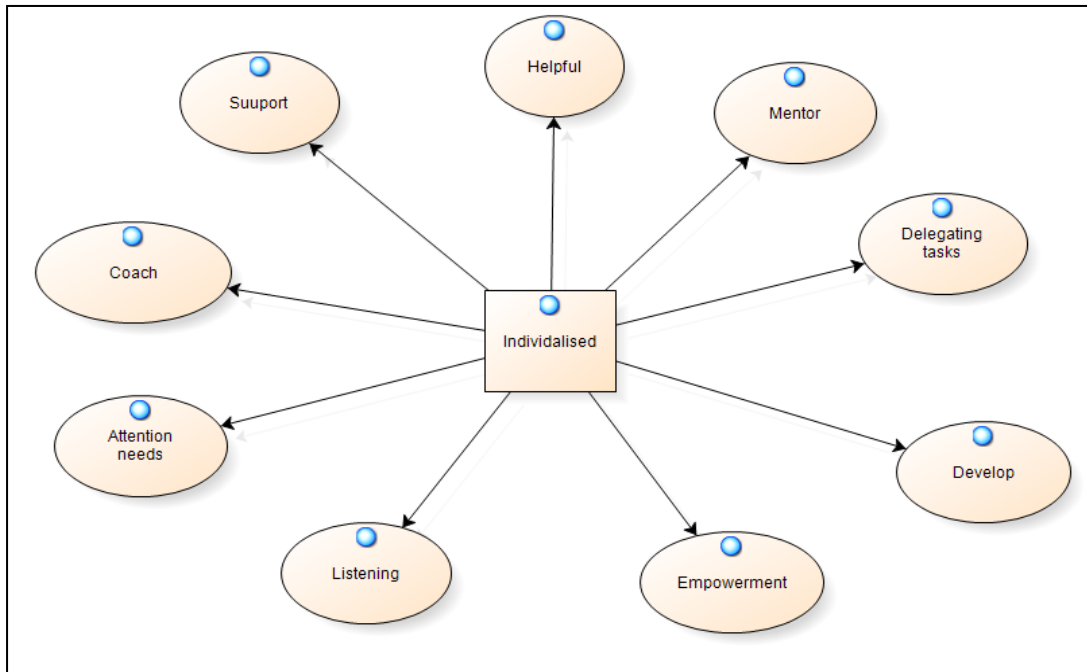
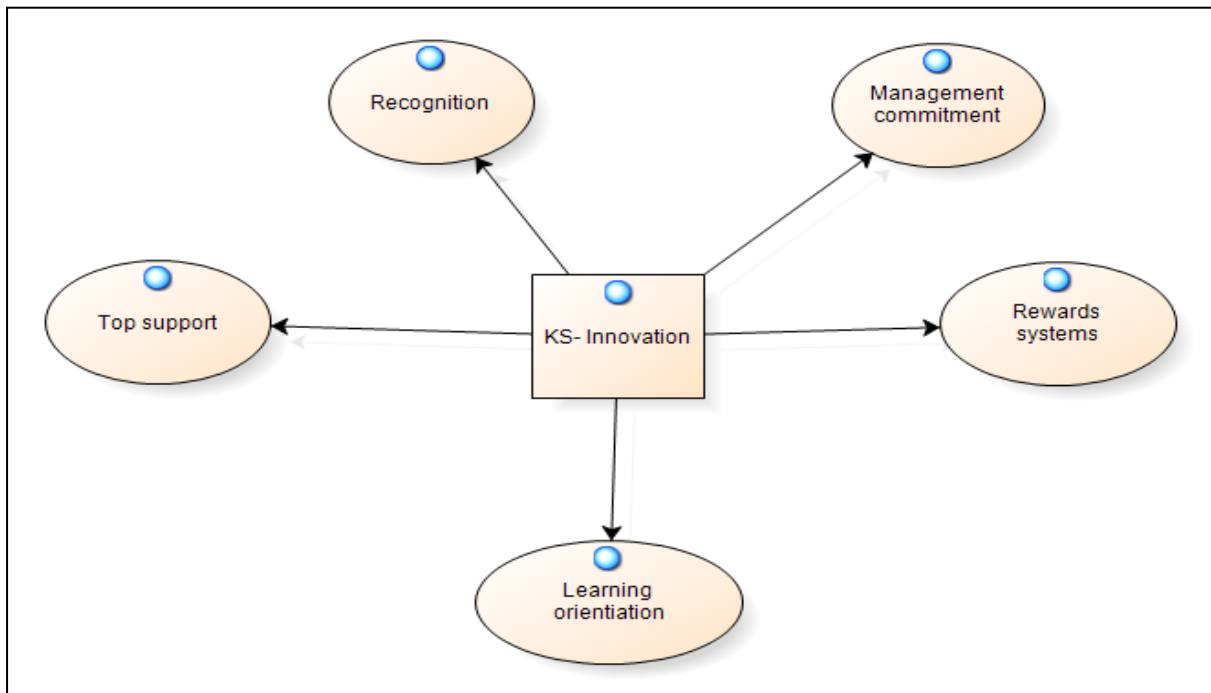**Appendix 7: NVivo output of the differences in the effect relationships**

1 . TL → innovation
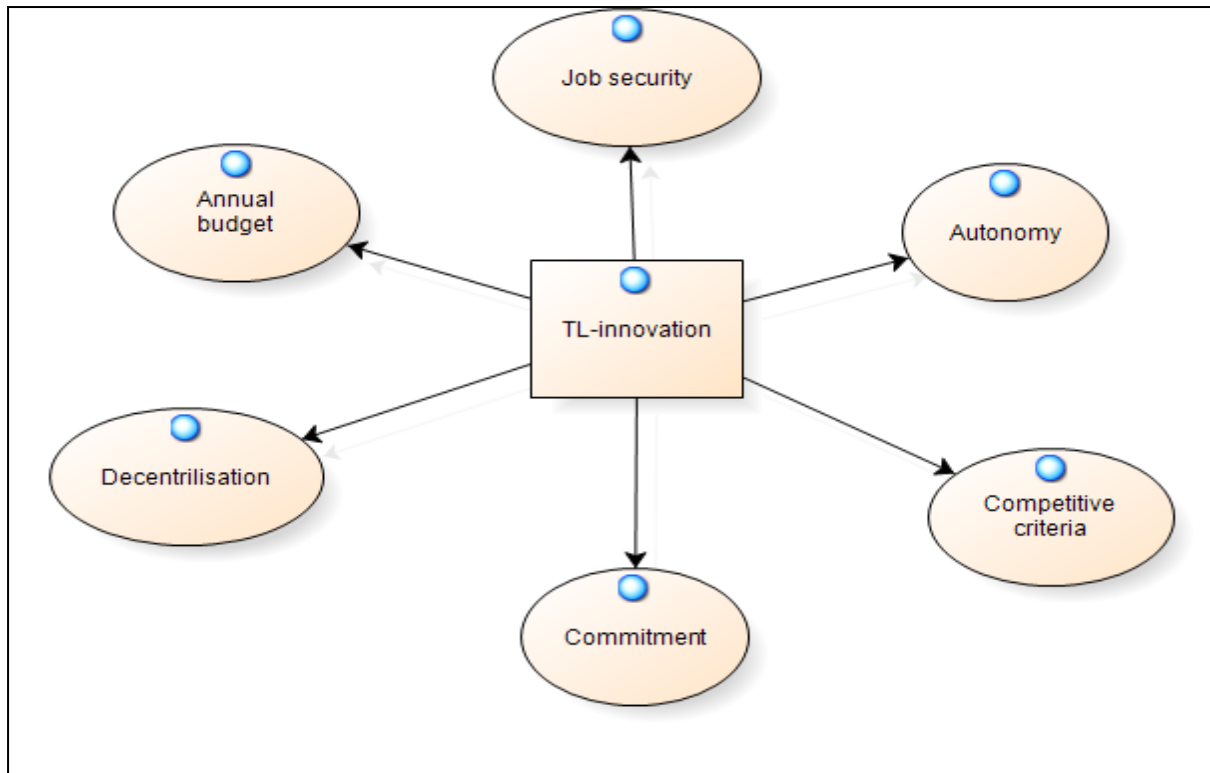
TL → KS

KS → Innovation

All the model