

On E-learning Infrastructure and its Acceptance in Urban Sudan: A Case Study of El-Geeteina Town

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ABSTRACT

This study aims to survey the E-learning infrastructure and its acceptance in urban Sudan. The researchers have collected survey data by using purposive sampling technique, by distributing a questionnaire to three categories: students, teachers and parents. The results show that there were positive opinions in regard to both traditional education as well as e-learning. Also, the results show that a good percentage of respondents have a smartphone at home.

Keywords — traditional education, e-learning, student.

I. INTRODUCTION

El-Geeteina is a small town located in the state of the White Nile in Sudan 100 km south of Khartoum. El-Geeteina is situated at the intersection of the latitudes (53 and 14) north and longitude (17 and 32) east, on the east bank of the White Nile. El-Geeteina is the pioneer of formal education in Sudan, where she founded her first school in 1902. There is continue migration to the town from the countryside, education is one reason for this migration.

The researcher will collect the data by using the purposive sampling technique, and that will be done in El-Geeteina town, the reasons for using this technique are:

- The data is available.
- The researcher can dig deeper into data and the research issue.
- Special researcher conditions.
- Due to time constraints.
- The scientific conditions (the sample verifies the research hypotheses).

II. REVIEW

E-learning contributes significantly to the dissemination of science and knowledge in many countries of the world, especially in third world countries. E-learning also has a significant impact on enhancing the student's motivation for learning. The environment in Sudan constitutes a fertile starting point for the success of e-learning applications[1].

There exist large fibre networks in Sudan, and most Sudanese pay large sums of money to mobile phone bills. The literacy rate in Sudan is 70.2% of the total population, which means that the degree of learning is very reasonable, which led to the proportion of beneficiaries and students who can deal with mobile technology continues to increase[1].

There is a favourable opinion of e-learning and educational technologies among policymakers, academics, and students in Sudan. Also, there was a high aptitude in ICT[2].

In a developing country, distance learning is useful to provide education and training for people in the workforce or adult education. In Sudan, education is often limited to those with the capacity to move to larger towns. The economic return of making education widely accessible is a powerful incentive for this work[3].

“It is good that you included videos and audios in the e-learning application. Since videos are musical, the learners will enjoy while learning at the same time. This will encourage learners to regularly attend school to listen to the videos, especially those that like music.” { A. Musiimenta, *et al* } [4]. The video and use a projector will help the learner get a clear understanding. Teachers reported that videos and audios would encourage students to learn mathematics and sciences while at the same time enjoying watching the videos and listening to the audio[4].

The aims of electronic education are: to change traditional concept of the education to keep up with the scientific progress and cognitive revolution, increase the effectiveness of the teacher and the learner, to widen the educational operation field, to get benefit from knowledge sites that are available on the internet and to sustain self educational skills and encourage the self-continuous education[5].

The teacher is purgative and facilitator, and he is capable of comprehensive and continuous self-learning. And the new roles of the teacher are a critical and sustainable friend, advisor, observer, and director. The learners role is to retain the information from the books and keep it in memory and recall it during the examination. The positive role of the learners: he is capable of using modern technology of the era, capable of taking self- decision, gains creative thinking skills and used it and contributes knowledge production and develops it. The e-learning is one of the most effective means, the e-learning provides a possibility of continuous learning[5]. Mobile learning (M-Learning) makes merge between technology and education possible. This can include different kinds of learner and learning environments. M-learning can be used to solve the traditional learning system problems.

The M-learning systems are not to replace traditional classrooms, but they can be used to complement the learning process in our schools and universities[6]. The mobile learning technique can enhance the performance of learners in distance learning programs, the Sudanese universities and communication companies must coordinate to spread the distance learning courses content[7]. In a study about mobile learning for English language learning among Sudanese universities, the teachers had positive attitudes towards adopting mobile learning. The teachers' mentioned that the most critical barriers that obstruct the adoption of mobile learning is the cost, lack of awareness, internet availability, privacy and appropriateness of the mobile devices, and rapid development of the mobile devices. A mobile phone has several benefits for learners: it is considered a useful tool for learning the English language. In addition to that, it enables students to learn English inside and outside the classroom. Furthermore, it will make students more productive to finish their lessons, readings, assignment and can join their colleagues in sharing knowledge and experience. The study showed that mobile is an assistive tool for language learning, and it needs to be considered in the educational field, particular in curriculum design and material development[8]. The well-designed software could help 2.3 million out-of-school children in Sudan. The children can learn autonomously, using the mathematics game[9].

Over the years, mathematics and sciences have been performed poorly worldwide[4]. In a study of the integration of ICT in teaching science and mathematics in secondary schools, most teachers did not integrate ICT in science and mathematics classrooms. Also, most teachers have positive attitudes regarding ICT integration in teaching and learning math and science subjects. One of the many obstacles mentioned by the teachers is the lack of training courses to use ICT, and also there was no internet connectivity. The study concluded that Sudan does not yet have the necessary infrastructure to integrate ICT into education. The study recommended: develop a plan to provide a good ICT infrastructure for secondary schools and support the development and design of educational software[10].

The respondent of the study done in Uganda about electronic learning mentioned that one of the challenges is a lack of access to modern teaching and learning resources. Also, the participants worried about the availability of sufficient technological infrastructure (e.g. internet, computers, and electricity) and skills to use the application. The study concluded that e-learning might improve performance in mathematics and sciences in otherwise marginalized schools[4].

In the Sudanese secondary schools, there is a lack of teachers trained in how to integrate e-learning into their teaching curriculum. In the school's there are large numbers of pupils in each classroom, a lack of equipment, suitable and relevant infrastructures, specialized and effective educational programs, and high cost of computer hardware's and their related maintenance. The provision of ICT facilities in Sudanese secondary schools will specifically provide morale

and confidence to both learners and teacher's readiness towards e-learning. Most Sudanese secondary school teachers were not ready for ICT because of the lack of training, infrastructures and reliable access to ICT[11]. Sudan does not have the infrastructure required to integrate ICT into education. There is a shortage of computers in secondary schools in Sudan. The use of Information and Communication Technology (ICT) in education in Sudan has a short history[12]. In Sudan, computer lab deficiencies are the main obstacles in secondary schools, and the teacher's role one is a crucial factor that has influenced ICT integration in the education system. This study summarizes that teachers have no strong desire and interest to integrate ICT in TVET classes, in accordance with the glance view of ICT policy in education, lack of ICT infrastructure, financial support, and teacher training in the basic computer skills[13]. The need is for comprehensive equipment and over the countryside to make real technology integration, there is no up to date statistics for the status of technology, There were efforts to integrate technology such as e-classrooms, providing some schools with an interactive whiteboard. The challenges are poor infrastructure, lack of digital skills among teachers'. The study recommended involving stakeholders and donors in issues of technology for schools[14]. The e-learning requires teachers training, directing research to serve the development of software to share in the computerization of the curriculum and building educational applications[5].

III. THE QUESTIONNAIRE

The survey to get the opinions about the traditional learning system and the e-learning system, the total number of government schools is eight schools (four schools for boys and four schools for girls), the questionnaire distributed to three categories: students, teachers and parents. The respondent's students from class 7 and class 8, the researchers were selected class 7 and class 8 because the students are more mature than the smaller student so they can answer the questionnaire; the total numbers of students in grade 7 and grade 8 in all schools are 690. The questionnaire was distributed to four schools; the respondents were 403 (boys and girls), 57 parents and 65 teachers (60 female).

IV. THE RESULTS AND DISCUSSION

The total number of respondent teachers in the four schools are 60 (57 female, 3 male - this may introduce the question of why this percentage). The respondent teachers aged between 30 and 60 years old, and their experience in teaching between 4 and 42 years. The teachers use of computers: 18.3% advanced and 21.7% don't know how to the deal with a computer, the type of teachers phone: 72.9% have advanced mobile while 27.1% have a traditional one, the teachers use of the internet: 10% use the internet intensively, 51.7 % middle, 16.7% few while 21.7% does not exist), The answers about the risks of using mobile are: (9.7% internet risks, 21.0% health risks, 6.5% overload and loss of time, 58.1% all the previous risks).

The total number of respondents parents are 57 (50.9% female and 49.1% male), the relationship with student: 89.5% father/mother and 10.5% brother/sister, the education level of the parents: 31.6% graduate and 8.8% postgraduate), the parents use of a computer: (17.5% advance , 42.1% middle, 22.8% simple , 17.5% do not know to deal with a computer), the type of parent phone: 86% have advanced phone while 14% have a traditional phone, number of modern mobile devices available at home (none 7%, 1-3 phones 57.9%, 4-6 phones 19.3% and more than 6 phones 15.8%), deal with internet (intensively 22.8% middle 47.4% few 14% does not exist 15.8%), the answers about the risks of using mobile: 5.3% internet risks, 10.5% health risks, 5.3% overload and loss of time, 75.4% all the previous risks.

The total numbers of respondent's students are 403 students from four schools (2 schools for girls and 2 schools for boys) from class 7 and class 8, there are 98.2% of students would like to increase their knowledge in their favourite subjects, the difficult subjects to understand according to students respondents are: 42.9% English, 20.6% Mathematics and 9.7% Science. 44.2% of students have a computer or a laptop at home while 87.6% have modern phones at home.

A. Opinions on the traditional education systems used.

TABLE 1

Teacher's opinions on the traditional education systems used.

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
Traditional systems develop intellectual skills	40.3 %	46.8 %		12.9 %	
Traditional systems develop students skills	27.4 %	41.9 %	6.5%	21%	3.2 %
Traditional systems Motivate students to learn	38.7 %	45.2 %	1.6%	12.9 %	1.6 %
In the traditional system students are bored with lessons	50.8 %	26.2 %	1.6%	18%	3.3 %

TABLE 2

Parents opinions on the traditional education systems used.

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
Traditional systems develop intellectual skills	19.3 %	49.1 %	5.5%	17.5 %	8.8 %
Traditional systems develop students skills	22.8 %	49.1 %	7%	12.3 %	8.8 %
Traditional systems Motivate students to learn	26.3 %	43.9 %	8.8%	15.8 %	5.3 %
In the traditional system sons are bored with lessons	5.3%	17.5 %	8.8%	38.6 %	29.8 %
I can easily follow the lessons with my son	38.3 %	42.1 %		14%	5.3 %

TABLE 3

Student's opinions on the traditional education systems used.

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
I feel the lessons is boring	11.7 %	4.1%	5.1%	31.8 %	46.7 %
The current education system motivate students to learn	46.5 %	27.4 %	6.7%	6.5%	12.6 %
I can easily follow the lessons	41.7 %	39%	2.4%	8.3%	8.6 %
There is a difficulty in understanding some subjects and lessons	24.5 %	40.1 %	4.9%	12%	18.5 %

The most respondent's teachers, parents and students have positive opinions about the traditional education systems

B. The student's uses of modern electronic devices (telephones, computers).

TABLE 4

The parent respondents about their sons uses of modern electronic devices (telephones, computers)

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
The son is good at using the computer	8.8%	19.3%	36.8%	10.5%	24.6%
The son is good at using the mobile device	40.4%	28.1%	22.8%	7%	1.8%
My son spends a lot of time using smartphones	8.8%	14%	35.1%	17.5%	24.6%
son has acquired knowledge from the use of devices	26.3%	33.3%	12.3%	19.3%	8.8%
The son is demanding the purchase of modern mobile devices	24.6%	19.3%	19.3%	8.8%	28.1%

TABLE 5

The students' respondents about their uses of modern electronic devices (telephones, computers).

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
I know how to use a computer	30.8%	10.2%	4.4%	8.6%	26%
I know how to use a modern mobile device	64%	19.6%	24.4%	4%	2.1%
Spend time using smart phones	17%	14.4%	10.3%	22%	12.7%
I gained a lot of knowledge from using devices	42.3%	27.6%	33.9%	8.6%	8.6%

I am asking my parents very much for the purchase of modern mobile devices	20.8%	5.8%	12.8%	10.7%	50.1%
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We note from tables that there is good percentage of the students knows how to use smart phones, and they feel they can gain a lot of knowledge from using computers and phones.

C. Opinions about the proposed education systems using technology tools (courses via smart phone or personal computer).

TABLE 6

Teachers opinions about the proposed education systems using technology tools (courses via smart phone or personal computer).

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
Devices can increase students' motivation for learning	58.1%	38.7%		3.2%	
photos and videos lessons using devices will improve students' performance	33.9%	54.8%	1.6%	8.1%	1.6%
Devices will distract students from studying	37.7%	49.2%	3.3%	4.9%	4.9%
Most teachers can handle personal computers	36.2%	51.7%	3.4%	8.6%	
Most teachers can handle smart phones	45.9%	42.6%	3.3%	8.2%	
Most teachers can handle the use of technology devices in education if training is	60.7%	32.8%		4.9%	1.6%

achieved					
Most teachers can handle minor malfunctions that may occur with these devices as they become available	31.1 %	44.3 %	4.9%	18%	1.6 %
technological devices have risks and negative effects	50.8 %	39.3 %	1.6%	4.9%	3.3 %

TABLE 7

Parents opinions about the proposed education systems using technology tools (courses via smart phone or personal computer).

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
Devices can increase students' motivation for learning	47.4 %	31.6 %		14%	7 %
I think the use of modern equipment in education will improve the performance of my son	33.3 %	31.6 %	8.8%	22.8 %	3.5 %
Devices will distract students from studying	37.5 %	37.5 %	5.4%	17.9 %	1.8 %
I can pursue my son's studies if the technology is used in education	22.8 %	31.6 %	8.8%	33.3 %	3.5 %
The family can follow lessons and assignments with the student in the event of the use of technological devices	15.8 %	35.1 %	10.5 %	28.1 %	10.5 %
family can handle minor malfunctions that may occur with these devices	15.8 %	47.4 %	15.8 %	15.8 %	5.3 %

as they become available					
technological devices have risks and negative effects	50%	42.9 %	1.8%	5.4%	

TABLE 8

Students opinions about the proposed education systems using technology tools (courses via smart phone or personal computer).

The question	Strongly agree	Agree	I do not know	Disagree	Strongly Disagree
Using the devices in lessons is Enjoyable	29.2 %	21.8 %	6.6%	18.5 %	24%
I can follow the lessons if they are available through the equipment	35%	32.9 %	10.2 %	11.2 %	10.7 %
The family can follow the lessons and duties with the student using the devices of the technology	31.2 %	30.6 %	11.9 %	11.9 %	14.4 %
I can handle minor malfunctions that may occur with these devices as they become available	28.2 %	25%	27.7 %	9%	10.1 %
technological devices have risks and negative effects	40.3 %	31.1 %	8.6%	7.6%	12.4 %

Most respondents have positive opinions about using the technological tools in the education, especially teachers and parents, but respondents agree that technological devices may also have risks and negative effect.

V. CONCLUSION

That most respondents have positive opinions about the traditional education systems, the author thinks is to be

expected and a normal result. This is because traditional education is essential and necessary, and the other forms of education are complementary to traditional education. There is a good percentage of respondents that have smart phones, we also note there is a good percentage of the students who know how to use smart phones, and they feel they can gain a lot of knowledge from using computers and phones. Most respondents have a positive opinion about using technological tools in education. This shows there is acceptance for e-learning. We can take advantage of the good infrastructure of the smart phone, which is available in most of Sudan, to develop the education through e-learning system but also must take into account the fears from the risks of this device. From the previous results, it is clear that there is a good basis for e-learning through the communication infrastructure presence that represented in a good number of smart phones available, also through acceptance by people of the idea of e-learning. These benefits made use to develop e-learning projects that help students develop and connect them with the outside world. The benefit lies in the small cities in Sudan that are in a greater need of this. It is also possible to develop education in the countryside through e-learning, such as, by targeting students outside of schools and adult education.

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