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THE USE OF ICT IN THE PROFESSIONAL DEVELOPMENT OF TECHNICAL AND VOCATIONAL EDUCATION INSTRUCTORS IN SUDAN AND EGYPT

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Abstract
This paper provides an initial attempt to study and investigate the interactive relationship between vocational and technical education instructors and using information and communications technology (ICT) and its impact of the professionalism of their work. The paper compares the ICTs usage in vocational and technical instructors in Sudan and Egypt as important countries in Africa. This paper explores two contexts "environments" that initially appeared a little bit different. It presents results of a survey administered to several instructors in Sudan (95) and in Egypt (120) which show that, excepting a few tasks, vocational instructors in both countries. Instructors from both countries responded similarly about (a) where they learned about ICT (for example, computers and Internet) and (b) the usefulness of ICT for technical and vocational centers in both countries. They also indicated feeling minimal concern when using technology. Furthermore, differences were in evidence in both countries where desire to use technology was concerned. Overall, Sudanese instructors showed a greater features and range in their choices when given the option to traditional teaching methods preferable than technology use to complete various tasks, whereas Egyptian clarified more attitudes toward technology compared to other context.

Keywords: ICT, instructors, technical education, vocational education

Introduction

Information and Communication Technology has become a very important component in all aspects of life particularly in education, and as (Mocanu & Deaconu, 2017) mentioned, life mainly reliant on the opportunity of using the numerous technologies.

ICT offers many possibilities for use in education. The use of technology in the educational process would achieve impressive results in educational outcomes, especially with regard to teacher training, and whenever the efficiency of instructors is raised in this field, no doubt, it's positively reflected on students regarding searching for knowledge and information, preparing lessons and communicating with instructors... etc.

There is an important role that instructors can do in order to renew teaching methods and apply communications and information technology. Therefore, training centers play a vital and decisive role in providing instructors with everything new and innovative in this field. Such as Bound, H., 2011; Vermeulen et al (2017) confirm that teacher training centers are affording the instructors of the forthcoming assume that they remain the key data in such development.

Despite clarifying importance of contributing information and communication technology in the educational situations and necessity to provide instructors with adequate of ICT for their work. As Gastelú, C.A.T, et al., (2015) who emphasize the level and amount to which ICT is presence and how it used in education enthusiastically. The situation is to some extent frustrating with regard to vocational and technical education generally.

Some researchers have indicated to this problem, such as: Deaconu, A., et al., (2018) who emphasized that the use of ICT in vocational and technical education as general is unsatisfactory, despite high prospects about the technology advance in education that have not been ensued. Mainly, the key efforts to involove and present the computers technology in education were centered-based, the instructor role in the innovation learning being reduced. Other study declared: These innovators persuaded to sight instructors as initiators of arranged tasks, concluding that complete tasks had to be framed to transfer the instructors to use computers in the classroom. Research has primarily stated the implications of learning with ICT for students or reasons influencing the employment of ICT by instructors, to increase more vision into the shifting roles of instructors using ICT in the technical classes. (Smeets, et al. 1999).

This paper highlights the status of information and communications technology and it use by instructors in vocational and technical education in Egypt and Sudan. Three research questions are formulated. First, what is the current situation of vocational and technical education in Sudan and Egypt and ICT use? Second, which means of technological media are preferable for TVET instructors? Third, how do instructors perceive the usefulness of technology for various center subjects and in future situations?

Technical and Vocational Education in Sudan

In Sudan, technical and vocational education and training (TVET) is considered more expensive education than the academic one, so the government depends mainly on establishing, financing and operating the TVET on nongovernmental agencies, and foreign aids at state and central levels. According to Washi, (2004), the launch of technical and vocational training in Sudan was in 1956, when vocational training center (VTC) in Khartoum was established to promote the skills of current employees. At that moment, the training center activities have been increased toward embracing vocational examination programs and skills measuring to individuals over the informal methods and usual vocational training. Accordingly, difficulties and challenges of school failure were demonstrated, and in 1964, the internship program had known succeeding adolescence to the level of a trained employee by assistance of German government. (Washi, 2004).

In early 20th century in 1901 the technical education in the Sudan was started through the establishing of technical secondary schools at Gordon College (these schools have developed to the University of Khartoum in 1956). According to (Bashir, 2006) such schools were developed to be technical colleges which became oriented to teach various disciplines such as engineering, electricity and veterinary medicine to accomplish needs of the government regarding the technicians (Bashir, 2006). The first middle technical school was created in 1907, hence the technical schools were extended to be about 28 schools. In 1954, the basis of Khartoum Technical Secondary School perceived, some modern departments were settled such as: electricity, carpentering, engineering, mechanics,...etc.. In 1960, a Higher Vocational College was established to engage students from vocational schools. According to Bashir, (2006). Such college that established according the international standards joined with a very decent educational environment and provided the local and external labor market with talented engineers in several fields. It was categorized by concentrated training programs supported by laboratories (Bashir, 2006).

Technical and Vocational Teacher in Sudan

Now in the Sudan, there are more than 400 vocational trainers that can be categorized into three groups: the first is consisted of experienced employees constitute around 5% of the entire number of trainers. This group is reducing because of the shortage of new enrolment. The second group included trainers of past graduates of VTCs who constitute about 70% of all trainers. According to Washi, (2004) some of those trainers promoted their skills to qualify for better working positions. The third group resides of university or college graduates were about 20% of trainers. This type of employ is not attractive to most Sudanese trainers which led to movement for many of them for better situation. Regarding instructors training, training program was presented through the federal Republic of Germany from 1964-1995 in which about 200 instructors were qualified. At present there are now more than, 470 of technical instructors working in the technical secondary schools throughout the Sudan. Unfortunately about 40% of them untrained and need to be qualified either by practical training or university studies.

Technical and Vocational Education in Egypt

The technical education generally represents the stage finished in most Arab countries (with a note to open a channel of higher education in part to some graduates of Technical Track- under certain conditions, in Egypt for example, and within 5% of those graduates). And the job of technical education in this way is to provide the labor market with its needs of different disciplines, from certain levels of employment.

In the Egypt, followed by (technical education) and the Ministry of Education, basically, where it currently has about 1810 technical school, enrolled nearly two million students (1.9 million) and go to the labor market, including more than 620 thousand graduates a year, according to official estimates. (MoM, 2008). In exchange for two million students from technical secondary education,

the students' number of secondary education, almost one million students, so the ratio is about 2:1 respectively (WB&ETF, 2006).

One of interesting projects in domain of TVET is pilot project: "Mubarak's project - Kohl"

The pioneering experiment for the development of technical education in Egypt called the (draft Mubarak - Kohl for the development of technical education and vocational training in Egypt). The idea of the project in 1991 and began steps to take effect in 1993 - then the practical application began in 1995 through a pilot project in city of "El-Asher min Ramadan", and then spread to other locations and new areas.

The most pioneering signs in (Mubarak's project - Kohl) as follows: The project is an advanced step on the way to raise the level of efficiency "quality" of students and graduates of Technical Education, who will be prepared as instructors in the future or civil servants. Accordingly, the students spend due to Egyptian schools' project two days inside the school and four days in the factories involved. It is implemented in relatively developed technical sites in the field, technological and management, new industrial cities and in agreement with the associations of investors or major companies. The responsibility of manufacturers and related companies include training students and afford this training (under the contracts for training and gives the student trainee financial reward monthly during the study period also enjoy priority appointment factory or company in accordance with the priorities. The project is implemented in three governorates: Giza, Qena, and the province of Dakhlia. Capacity development employment is eligible for youth employment in the workplace appropriate (UNEVOC, 2006).

ICT in both environments

Information and communication technology (ICT) is very gelatinous term expanded on all aspects of life. Many scholars tried to give specific definition to such idiom. For example: Smeets, (1996) emphasized the ICT is a comprehensive term stating to technologies that are being used for assembling, storing, editing and passing on information in several formulae. The best-known instance refers to using ICT in education is computer, nevertheless the term multimedia is also commonly used. Multimedia refers to a blend of data carriers, for instance video, internet and software in which the opportunity for presenting an interactive approach (Smeets, 1996). Recently, ICT definition developed more generally used by Fong (2006) who described that information and communication technology (ICT) is a central term that involves communication tools as devices or applications, for example: radio, television, smart phones, computer and networks, ..etc. But Derek, (2008) presumed that a modern labor market is almost unreasonable in case of lacking ICT, digital literacy is progressively detected as a vital competence.

According to table no. 1, the demographic information for Egypt and Sudan systems (Population, Fixed telephone lines, Cell, Computers, Internet Users, Population covered by mobile signal) could be illustrated.

Table 1. Demographic Information for Sudan and Egypt Samples (2016)

Demographic category	**Context**	
	Sudan	**Egypt**
Population (millions)	36,345,935	95,041,072
Labor force (million)	10.92	28.95
GDP (US$)	$180.1 billion	$1.152 trillion
Fixed telephone lines	136,472	6,118,250
Mobile cellular	27,807,293	97,791,441
Internet users %	28.0%	39.2%
Internet users in Sudan & Egypt	10,284,260	37,122,537

Situation of ICT in Egypt

The Ministry of Communications and Information Technology (MCIT) launched ICT polices in 1999. Two strategic objectives were perceived by the specialized ministry: one is to binge ICT tools throughout the country and the second is to put the base of an export-oriented ICT industry. Several of the governmental policies and enterprises aiming accomplishment of these objectives are made known to the general community. According to Hamdy, H., (2007), the MCIT made smart corporations with the private sector, UN agencies, and civil society organizations toward making best use of the outcomes (Hamdy, H., 2007). Furthermore, the situation of ICT in Egypt could be determined according to:, Online the European Mathematical Information Service (EMIS) at central and local level, National video conference network for teacher training (63 sites), Short Message Service (SMS) at 38 schools, Computer labs at 4611 schools, High speed connections at 152 schools and Dial-up at 22000 schools, Multimedia Labs: 1800 Pre-primary, 11925 Primary, 6195 Prep, in addition to 1205 Secondary Source (Strategic plan). Educational reform has given high priority by the Government of Egypt on its agenda. Based on this, the education is receiving about one-third of Government spending on the services sector. The main motivation for using technology in education is the firm belief that it will improve teaching/learning and efficiency of management. Fundamental change is induced that involves legislatures, business, instructors, colleges of education, and school administrators. Egyptian educational institutions consider technology as an important driver for causing the essential changes called upon in the new reform efforts. (Mandour, 2009; Egyptian Education Initiative, 2008) The following polices are interesting according to: incorporating technology into curricula, applying ICT classification system to schools, capacity building of human resources, enhancing EMIS, SMS at both availability and usage levels, distant Learning for professional development, decentralization and restructure of ICT management.

Situation of ICT in Sudan

Sudan's practice in establishing and taking advantage on ICT as an entry for promising progress is curvature spot in history of the country past years. The official, permitted and leading context was carried out to support ICT as an approach for integrating issue of the economy addicted to international

marketplace. Strategy of Sudanese countrywide ICT was established in 1999. This strategy emphases on the following five main element: infrastructure of the technology, development human resource, development industry digitalization, and Arabic content (Hamdy, 2007). In the frame of the national policy, the policy inspires the usage of ICT in emerging the national policies to guarantee that integration of ICT in education and training on all planes is activated, involving the development of curriculums in the schools, continuous training for instructors, and handling the educational institutions systemically (Abdelrahman, 2009). In 2002, The policy of ICT in the instruction system was recognized. The objects that supervising and executing such system are information board, the board of curriculum center, and training center. ICT was presented in curricula of secondary schools in 2004. Several computers were connected in schools (about 50% of schools were connected by computers), in approximately ten computers for each school. The connectivity in schools was principally relied on dial-up and ADSL techniques. Nevertheless, the connection depended on ADSL only in the higher education. The Sudan is planning to have technology accessible in all levels of education institutions by 2020. In addition, The ICT curriculum was presented at primary school in the grade four. Training instructors on the basics of ICT was introduced as well. The government and the private intuitions delivered the internet access as a resource to support the learning environment (Hamdy, 2007). The Sudanese Ministry of Education provided the schools and instructors' training centers with technology. The initiative for emerging system of the educational management information was carried out as well. The Sudanese government invested severely in information and communications technology to enhance both spread and access to ICT and make use of all inexpensive products, while there is an open marketplace and competition in providing internet service delivery, there is only an Internet Service Provider - Sudanet (El-Tigani, 2010). In future, it is programmed to provide many Internet centers "Café" in capital. Development in ICT in Sudan is evident in a significant development of infrastructure and investment including learning management systems (LMSs) and man power (Elamin, 2004). Fatima (2009) stated that there are numerous challenges delay the best implementation of ICT, despite of the appreciative efforts and policies provided by the government such as: delivery to rural and distant zones yet faces a large obstacles, for instance: the poverty, resources deficiency, and political conflict sets ICT minor on the significance needs in most Sudan districts, civil war delay employment, funding and highlight attention in Sudan stays restricted, particularly through number of limitations that remained forced.

Method

The current paper relied on descriptive and instructive information of the research problem. We collected data via a designed questionnaire prepared by the researchers to get data from enormous group of instructors in both vocational training centers and technical secondary schools in Sudan and Egypt. At the side of the secondary data which is collected electronically from web, reports, and literature.

Participants

More than 200 instructors have been selected to participate to this study. 95 from Sudan and 120 from Egypt represented vocational training centers and technical schools. Those were distributed according to some variables (education qualification, sex, age and years of experience) to test their dealing with the new technology (ICT) in teaching and learning process.

Data Analysis

The researchers first collected data by coding them, then they entered the data digitally in the computer, after that the analyzing process was done through (SPSS) for Windows, version 19. The researchers used the technique of cross-tabulation to compare results between samples of both countries. The researchers used the descriptive statistics to define the respondents' demographic characteristics and to investigate the distributions of respondents in many categories.

The researchers prepared frequencies and percentages tables and figures that presented in the following section, additionally, other methods such as Cross tabulation is used to explore relations between variables.

Findings and Discussion

Findings of current paper were interpreted through the following descriptive statistics: frequencies and percentages to present overall outline and to compare the situation in Egypt and Sudan.

Integration of ICT in learning/teaching process

According to table 2 below, the results indicate that toward technical education instructors in Egypt that about 51,1 % respondents responded positively to integration of ICT to learning and teaching process. Whereas, in Sudan about 36,8% of respondents responded positively to integration of ICT in learning/teaching process.

Concerning Vocational education instructors, the results indicate that 43,7% respondents in Egypt responded positively to integration of ICT to learning and teaching process. Whereas, in Sudan about 37,9% of respondents responded positively to Integration of ICT in learning/teaching process.

Table 2. Impact of ICTs in learning and teaching process

Country	Institution Type	Integration of ICT in learning/teaching process			Total	Entire total
		Yes	No	I do Not know		
Sudan	Technical Secondary School	35 36,8%	4 4,2%	6 6,3%	45	95
	Vocational Training Centre	36 37,9%	6 6,3%	8 8,4%	50	
Egypt	Technical Secondary School	45 51,1%	43 48,9%	0	88	120

Vocational Centre	Training	14 43,7%	17 53,3%	0	32

Use of computers and Internet according to the age of respondents

As shown at fig. 1 below, the results indicate that percentage of using computer and Internet by technical and vocational education instructors is extremely different with respect to age group, for example the use of respondents between 20-29 is higher in Egyptian instructors comparing to Sudanese instructors, it as bout 13% however, no one is identified on the other group. From 30-39 is more than the previous, it is about 5% by Sudanese instructors, and 17% by Egyptian instructors. In terms of 40-49 age groups, it was identified lesser than the previous age; however, it is 3% in Sudan, and about 8% by Egyptian instructors. Regarding the elder age, it was identified no use through both groups.

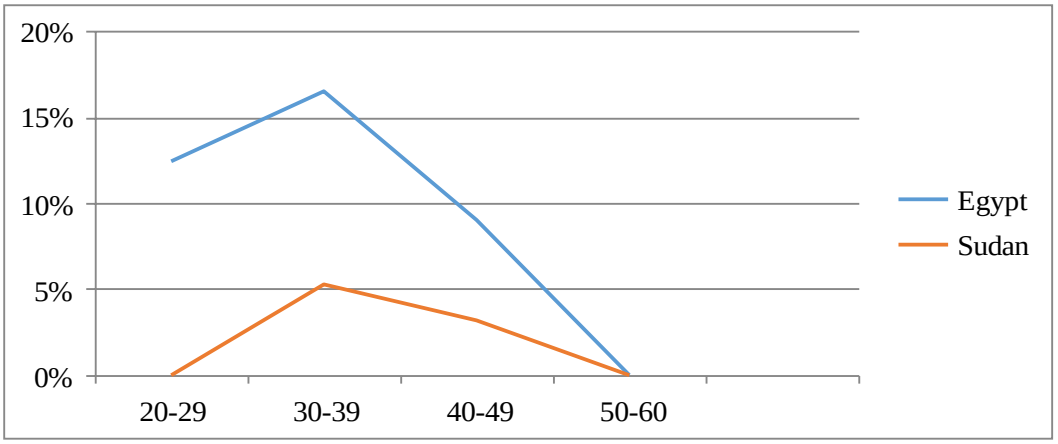


Figure 1. Usage of computer and internet by Age of respondents in Egypt and Sudan

Use of Computers and Internet by Education Qualifications

As shown at fig. 2, the results indicate that relationship between qualification and using computer and Internet by technical and vocational education instructors is extremely similar. With respect to bachelor qualification, the instructors who hold Diploma are higher than bachelor concerning the usage. In Sudan, some instructors have only the Sudan school certificate still in power. But the sum involved in the group is decreasing as an outcome of the new recruitment deficiency**.**

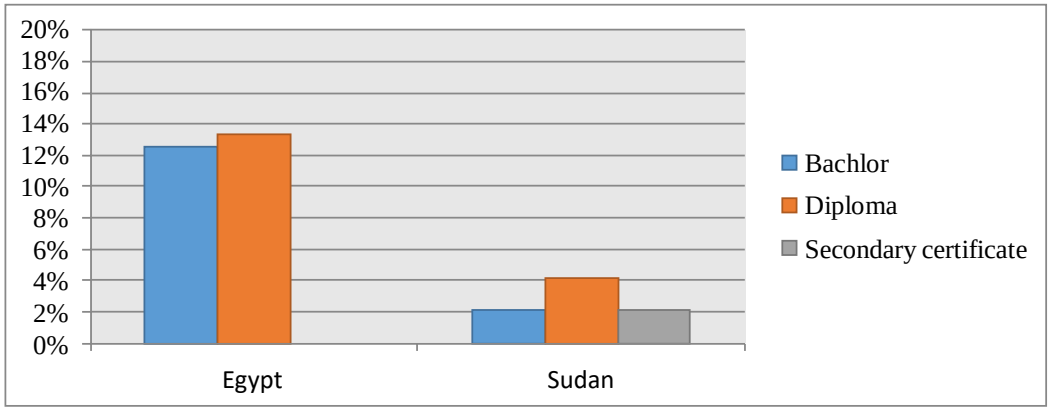


Figure 2. Usage of computer and internet by Education qualification in Egypt and Sudan

Rank of ICT tools.

As shown at fig. 3 below, only instructors in Egypt are clarified their usability to ICT tools. The results indicate that the priorities of using ICT by instructors. The most tools used were the web sites (31%), followed by e-courses, projectors using, Multimedia, social network ...etc.

Concerning the instructors' preference in using ICT tools in Sudan, no one gave priorities to ICT tools, because About 90% of instructors didn't use the technology especially the computers in teaching environment. They valued "No" it's an authentic answer, some of them supposed honestly, they do not recognize how to use the computer principally, not to remark the internet. About 7% of them responded they have restricted knowledge toward usage certain computer programs in designing the instructional modules such as Microsoft Word or Power Point; nevertheless, the Looking for information related to educational subjects through the internet is remain a fancy effort.

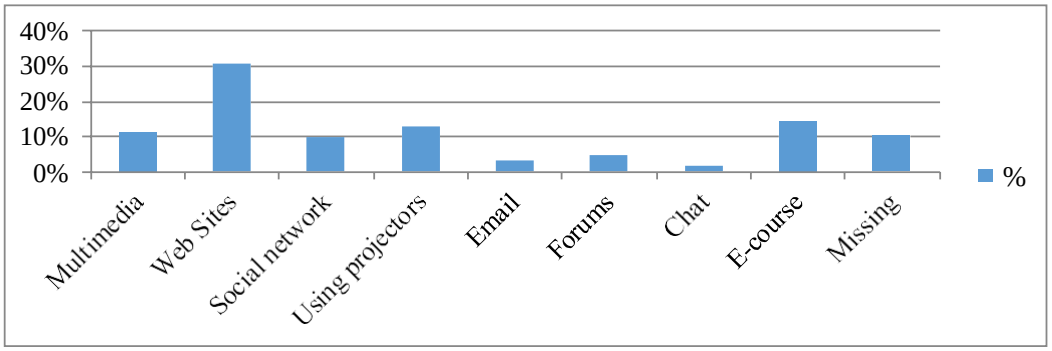


Figure 3. Rank of using ICT tools in Egypt by TEVT instructors

Conclusion

The usage of new technology and information for instruction has developed well-recognized in the world, and as of now, all features of development can be improbable resulted from lacking usage of ICT. Consequently, there is a worldwide agreement that the usage and activation the technology especially computer-based learning in the schools institutions has grown up more

differentiated as instructors distinguish the learning potential toward technology as an instrument for promoting students' competences. Unfortunately, the current situation of utilizing ICT in the institutions of vocational and technical education in both Sudan and Egypt seem discouraging especially from the instructors' side and school environment generally.

Egypt and Sudan are still facing great challenges, and, TVET's adoptions of new technology into the teaching process. These challenges require equipping schools especially TVET institutes with computer labs, enabling teaching and learning in computer programs designing and computer literacy, emerging new programs, syllabi supported by using ICT.

Teacher should be developed through some strategies such as: technology usage to promote student engagement and performance, integrate the appropriate strategies for using and activating information technology to augment engaged learning for students with different learning styles, and develop plan for a personalized professional development that affords for technology skills attainment and technology integration into classroom developments.

Further research could be measured in order to attain additional evidences about the impact of ICT completed empirical learning and teaching. Forthcoming research can afford a detailed explanation of the possible technologies in the professional development of technical and vocational education instructors in Sudan and Egypt via quantitative and qualitative research approaches.

Additional investigation might cover the period of such experimental research to diverse students' groups to highlight a longitudinal method and the numerous constructive and undesirable challenges of using ICT within an extended period.

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