

## The Inevitableness of Teachers Training in the Pedagogical Use of ICT for Innovative Online learning in Sudan

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### Abstract

After launching the ICT policy of education in 2002 the Sudanese Ministry of Higher Education exerted great efforts to qualify the teaching staff of the universities in the use of ICT. However, there was obvious deficiency in the teachers' use of ICT. This study aimed at concisely evaluating the status of the teacher training in the use of ICT in education according to the finding of successive researches. It also aimed at creating an understanding of the importance of providing quality training for the teachers in the use of ICT, besides, suggesting a framework for developing the teachers' capabilities in the utilization of ICT in education. After reviewing the results of the most recent researches, this study found that: the training courses in the use of ICT were improvised and only confined to some basic computer skills, concentrated on the theoretical side of the subject and that they were not given adequate time. Besides, there was no training in the pedagogical use of technology the thing that may hinder the success of online learning in Sudan. However, none of these studies proposed a plan for training the teachers in the utilization of ICT in education. Thus, in view of these results the study suggested a framework for training the teachers in the pedagogical use of ICT. It also suggested some recommendations that should be considered alongside the training courses.

**Keywords:** Information and communication technology (ICT), integration, pedagogy, innovative, online learning.

## حتمية تدريب المعلمين على التوظيف التربوي لتكنولوجيا المعلومات والاتصالات من أجل تعلم إلكتروني مبتكر في السودان

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### المستخلص

بعد إطلاق سياسة التعليم في مجال تكنولوجيا المعلومات والاتصالات في عام 2002، بذلت وزارة التعليم العالي السودانية جهوداً كبيرة لتأهيل أعضاء هيئة التدريس بالجامعات في مجال استخدام تكنولوجيا المعلومات والاتصالات. مع ذلك نجد أن هناك نقصاً واضحاً في استخدام المعلمين لتكنولوجيا المعلومات والاتصالات. هدفت هذه الدراسة إلى إجراء تقييم موجز لوضع تدريب المعلمين على استخدام تكنولوجيا المعلومات والاتصالات في التعليم وفقاً لما توصلت إليه البحوث المتتالية. كما هدفت إلى خلق فهم لأهمية توفير تدريب جيد للمعلمين في توظيف تكنولوجيا المعلومات والاتصالات في التعليم، بالإضافة لتقديم إطار لتطوير قدرات المعلمين في توظيف تكنولوجيا المعلومات والاتصالات في التعليم. وبعد استعراض نتائج أحدث البحوث، وجدت الدراسة أن: الدورات التدريبية في مجال استخدام تكنولوجيا المعلومات والاتصالات كانت مرتجلة وإقتصرت فقط على بعض المهارات الحاسوبية الأساسية، وركزت على الجانب النظري للموضوع كما أنها لم تعط الوقت الكافي. إلى جانب ذلك لم يكن هناك تدريب في مجال الاستخدام التربوي للتكنولوجيا الأمر الذي قد يعيق نجاح التعلم الإلكتروني في السودان. وعلى الرغم من هذه النتائج لم تقترح أي من هذه الدراسات خطة لتدريب المعلمين على توظيف تكنولوجيا المعلومات والاتصالات في التعليم. لذلك وفي ضوء هذه النتائج، قدمت الدراسة إطار مقترح لتدريب المعلمين على توظيف تكنولوجيا المعلومات والاتصالات في التعليم. كما اقترحت أيضاً بعض التوصيات التي ينبغي أخذها بعين الاعتبار بجانب الدورات التدريبية.

كلمات مفتاحية: تكنولوجيا المعلومات والاتصالات، دمج، تربوي، مبتكر، تعلم إلكتروني.

### Introduction

Training and preparing teachers with the needed knowledge and skills is a vital factor to the success of the whole learning process. There is a tremendous potential for innovative and creative learning to take place in the learning process, when the teachers are fully competent and confident in the pedagogy of using information and communication technology (ICT) (McCarney, 2004).

The ICT entered the educational field in the developed countries many years ago, but, it is relatively new in Sudan that is why teachers will need professional training to deal with it.

Therefore, the study succinctly reviewed the progress of ICT in the Sudanese education. It also summarized the findings of some researches concerned with ICT training to create an understanding of the current status of teachers' training in the use of ICT.

The study is conducted by using literature survey that is driven by the question: what should be considered with regard to the teachers' training when implementing ICT in education to derive quality online learning? Thus, it explained the principles of teachers' training in the use of ICT, different kinds and stages of teachers' training in the pedagogical use of ICT and its importance for improving higher order thinking skills, the incentives that motivates the teachers to participate in ICT training, beside, the barriers and common mistakes in ICT teachers' training. All of this provided a source of information that was used to propose a framework for developing the teachers' capabilities in the use of ICT in education.

## Importance of the Study

The importance of this study is represented in the following:

1. It provided basic knowledge about teachers' training in the use of ICT to improve the understanding and contribute in filling the gap in this area.
2. Building an understanding of the importance of providing quality training for the teachers in the use of ICT for providing quality online learning.
3. It provided framework for developing the teachers' capabilities in the use of ICT education.

## Objectives of the Study

The study aimed at:

1. Evaluating the status of the teachers training in the use of ICT according to the findings of successive researches.
2. Creating an understanding of the importance of providing quality training for the teachers in the use of ICT.
3. Providing a framework for developing the teachers' capabilities in the use of ICT in the teaching/learning process in education.

## Problem of the Study

Most of the Sudanese universities have staff development centers that are responsible for providing training courses for the teaching staff. However, the Staff training courses in the use of ICT are unpremeditated, limited to basic computer skills, concentrate on the theoretical side of the subject and are not given adequate time. Besides, there is no training in the pedagogical use of technology. This has generated clusters of problems: many teachers are information illiterate and the majority of them are illiterate in the pedagogical use of ICT, and the minorities who know how are struggling to convey their knowledge to their students (see figure 1).

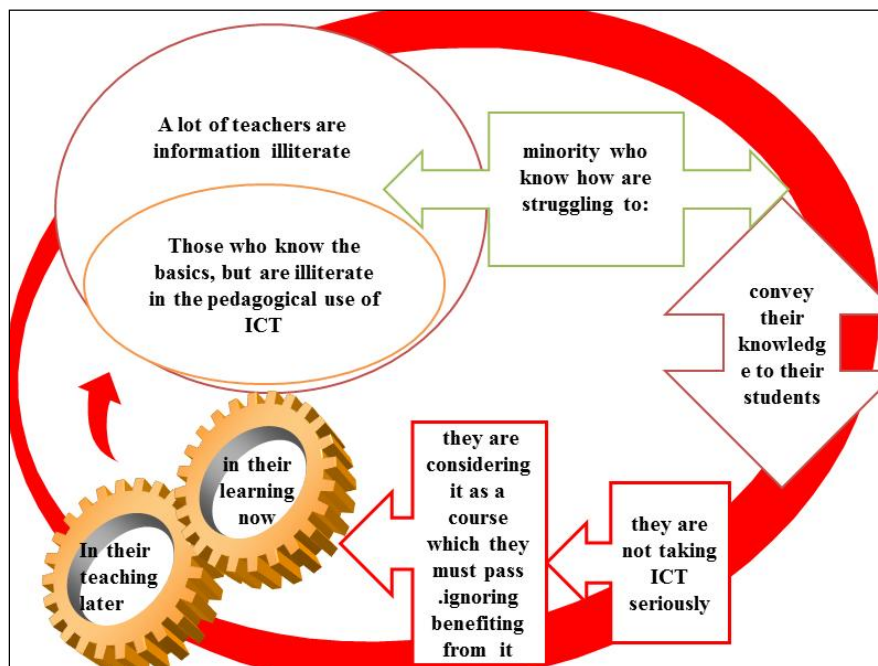


Figure 1: problems of lack of ICT teachers' training

## **Methodology of the Study**

This study used the descriptive analytical method to describe, analysis and critique the reality of teachers' training in the use of ICT in education; to determine its suitability for providing quality online learning through reviewing the findings of eight successive studies starting from 2004 to 2016. Evaluating the facts and information from these studies would help in finding out critical details about teachers' training in the use of ICT, to add new ideas and supporting evidence to make more reliable teachers' ICT training courses.

## **Terminologies**

### **Pedagogy**

It is the art, science, or profession of teaching and the studying of teaching methods. It includes teaching styles, feedback, and assessment. While each teacher has a different pedagogical approach to learning in their classroom, they should consider the most effective means of content delivery based on student needs and how the students learn best (Merriam-Webster, 2021).

### **Information and Communication Technologies (ICTs)**

Refers to all communication technologies, including the internet, wireless networks, cell phones, computers, software, middleware, video-conferencing, social networking, and other media applications and services enabling users to access, retrieve, store, transmit, and manipulate information in a digital form (Michalsons, 2020).

### **Online learning**

Online learning or electronic learning, is the acquisition of knowledge which takes place through electronic technologies and media. It is conducted on the internet, where learners can access their learning materials online anytime anyway (Abernathy, 2019).

### **Integration of ICT in education**

Refers to the use of technology to accomplish intended learning outcomes and to enhance the student learning experience. The implementation of technology also creates pathways for differentiated instruction to meet the unique needs of students as individual learners within a broader classroom climate (Davies and West, 2014).

### **Innovative Education**

Innovative education is a deliberate use of information and technology to derive greater values from resources. It takes place when resources and ideas are applied to satisfy the present and the future needs of the students. Technology plays a key role in innovative teaching. Innovative teachers use technology to enhance and expand the student experience (Tylor, 2017). By creating learner centered education through encouraging students to:

- Interact with the teachers (experts).
- Interact with peers.
- Gain more practical experience.

### **Literature Survey**

This survey attempts to cover the necessary aspects that should be considered when conducting effective teachers' training in the use on ICT in education.



## **Principles of teachers' training in the use of ICT**

Teachers' training in the use of ICT incorporates certain essential principles which should be considered when commencing ICT training. The followings are key principles which should be followed in the professional development programmes for teachers (Education Department, 2007):

- Educational goals should be primary. The focus should not be on providing technical ICT skills only, but on the use of ICT to achieve learning outcomes.
- Teacher development programmes should provide teachers with situated/contextualized learning experiences. Programms should be subject-specific and relevant to the learning areas because ICT skills cannot be practiced in isolation from their context.
- Teacher development programs need to be driven. Programms should respond to the requirements of subjects such as computer application technology, information technology, geography, design and accounting.
- Ongoing support should be consistently available. This includes pedagogic support (particularly from subject advisers), technical support and creating communities of practice.
- Teacher development should be ongoing, due to the changing nature of ICT. Programms should reflect new technologies and applications.

According to Education Department (2007), teachers' development should have the following dimensions:

- A technical dimension: incorporates knowledge and practice.
- A pedagogical dimension: implies an understanding and application of the opportunities of the use of ICT for teaching and learning in a local curriculum context.
- A technical dimension: implies an ability to select, use and support a range of ICT resources as appropriate to enhance personal and professional effectiveness; and the willingness to update skills and knowledge in the light of new developments.
- A collaboration and networking dimension: includes a critical understanding of the added value of learning networks and collaboration within and between partners; and the ability to create and participate in communities of practice.

## **Kinds of teachers' training in the use of ICT**

Teachers are central to the implementation of ICT in education. The challenge for teacher development in ICT is to provide them with the necessary knowledge, skills and understanding to successfully integrate ICT into everyday educational practices in a meaningful way. Therefore, the training courses should cover the following stages:

### **- Pre-service training**

It is initial teachers' training courses for the student teachers in the colleges of education. All students leaving higher education for the teaching profession should have reached at least the adoption level to redefine the role of the teacher and classroom environments by using ICT as a flexible tool for collaborative and interactive learning. This means that they should have the knowledge and skills to use a various ICT application to support traditional management, administration, teaching and learning, and be able to teach learners how to use ICT (Charalambous, 2002).

**- Orientation/introduction: training during the first few years of teaching**

According to UNISCO (2008), this stage focuses on the adaptation and appropriation of the knowledge, skills and values to integrate ICT into teaching and learning by becoming skilled at the following areas:

- Subject mastery.
- Pedagogical skills.
- Assessment techniques.
- Management of teachers' professional documents.
- Online learning methods and technology.
- Virtual collaborations.
- Virtual communication technology tools.

**- In-service training: teacher development training or continuing professional development.**

It is considered as a crucial issue for the implementation and institutionalization of new ICTs in the educational system. It depends on School-based courses, as well as courses that focus on the pedagogical dimension of ICT integration (Charalambous, 2002). It is also concerned with the impact of the training on the personal attitudes and skills. It is a flexible stage which needs flexible pick and mix training structure tailored to individual needs to make professional development activities more relevant to the context of the classroom practice (Karagiogi and Charalambous, 2007).

**Teachers' training in the pedagogical use of ICT**

As mentioned previously staff development in ICT should not concentrate only on the skills and the technical use of ICT rather than on the pedagogical use. Teachers may attend a training course and learn word processing or 'surf the net' or develop web pages, but these skills must be placed in a pedagogic context and teachers must be shown how to refocus their work and lessons to take account of ICT. This pedagogic context should enable teachers to understand how to use ICT in teaching, to consider how ICT can support and enhance learning as a natural part of the teaching/learning process, to consider how ICT can provide more learning opportunities and be another vital learning tool for students. When the teacher is using ICT, he or she will be teaching about ICT in an implicit manner and will be developing students' practical skills, and it will also be about creating enhanced learning contexts and challenges for students in many curricular areas. This is the crucial challenge that faces the teachers and for which they need support and staff development (McCarney, 2004).

**Teachers' motivation and incentives**

Teachers generally are reluctant to change their teaching styles and habits; have difficulty seeing the potential payoff beforehand ICT training; and may feel so threatened by technology that they want to distance themselves from it rather than embrace it. That is why many teachers require motivation and incentives to participate actively in professional development training (Carlson and Gadio, 2002).

There are many incentives (extrinsic and intrinsic) that could be used to motivate teachers to participate in professional development training course in the use of technology in teaching. Therefore, to start the goal leadership has to find what motivates the teachers to in

role in the training. That's why; teachers need to know the advantage of using technology so as to be encouraged to adopt ICT where appropriate in their professional lives as classroom practitioners, as planners, managers and as learners. Thus, training needs to present ICT convincingly as a vehicle through which the curriculum can be developed and delivered rather than a separate entity (Williams *et al.*, 1999).

Unfortunately, teachers' ICT training courses in Sudan concentrate only on the basic of technology.

### **Importance of teachers' training in t ICT of use of**

Utilizing ICT in the teaching/ learning process is important for improving higher order thinking skills. According to Brained Library (2017) ICT training supports the problem-solving and critical thinking aspects by developing the ability of teachers and the student teacher to:

- Apply ICT skills to access, analyze, evaluate, integrate, present and communicate information.
- Create knowledge and new information by adapting, applying, designing, inventing and authoring.
- Function effectively in a knowledge society by using appropriate ICT and mastering communication and collaboration skills.

Furthermore, when ICT is successfully integrated into teaching and learning, it can ensure a more meaningful interaction of learners with information. ICT can promote the development of advanced cognitive skills such as comprehension, reasoning, problem-solving and creative thinking (Hindle, 2007), as well as the ability of learners to:

- Identify and solve problems and make decisions using critical and creative thinking strategies.
- Work effectively with others as members of a team, group, organization and community.
- Organize and manage themselves and their activities responsibly and effectively.
- Collect, analyze, organize and critically evaluate information.
- Communicate effectively using visual, symbolic and/or language skills in various modes.
- Use science and technology effectively and critically, showing responsibility towards the environment and the health of others.
- Demonstrate an understanding of the world as a set of related systems by recognizing that problems cannot be separated from their contexts.

### **Barriers and common mistakes in ICT teachers' training**

Staff development and teacher learning need to be conceptualized as 'work' and 'at work' and that staff development must be regarded as an important work that is directly related to the teachers' work with their students. This highlights the need for effective and relevant staff development in ICT considering the nature, type and form of the required staff development. Effective strategies need to be developed to support these models (McCarney, 2004).

But, to say the least, this is easier to say than to do because training teachers is a very expensive activity and hence, often much neglected in large-scale innovations (Pelgrum, 2001).

That is why institutions try to minimize the expenditure by providing short training courses, and this style of training does not provide sufficient opportunity for breadth and depth of study.

Another ineffective training strategy is the manner in which teachers are selected for in-service courses and their perception of such courses. The perceived needs of teachers and their actual needs can be seriously mismatched: teachers may select, or be selected for, a course which they believe has certain outcomes, but on attending the course they discover that it is not the most suitable for them and does not meet their needs. This is a problem in the area of ICT as many education institutions react to the need for staff development without fully taking account of the purposes of the in-service offered and the actual needs of their teachers. Unfortunately, teachers who experienced poor quality in-service may find this to be extremely demotivating, which can lead to apathy or a resistance to change (McCarney, 2004). Thus, conducting training in an ineffective way may bring passive results which can be dangerous to the implementation of the online learning in the long run.

All these issues show that new approaches are required for teacher development and that the traditional model of 'one size fits all' no longer applies (Bredeson, 2000). Training courses must be designed and tailored to the individual needs of the teachers.

### **ICT training that is given to the Sudanese university teachers**

This section will briefly demonstrate the findings of eight studies about teachers' training in ICT:

According to the study of Mohannad Hassan (Hassan, 2004) "A survey of the use of computers at El-Gabbass primary school, Khartoum, Sudan" the main objective of the teachers' training courses was to master basic skills of using computer, but not to familiarize the teachers with the knowledge and skills that are necessary for integrating ICT in teaching and learning.

Altyeb Ahmed Ibrahim (Ibrahim, 2006) in his study "In-service training of Basic Level teachers' in Sudan – Evaluative Study", approved that there was no clear plan for the training. Besides, there were no qualified bodies to carry out the training.

Another study "The use of computers applications in the education colleges at Khartoum State" which was conducted by Nawal Babikr Mohamad (Mohamad, 2008) concluded that the majority of the teachers didn't have enough experience in using computer's applications because of the lack of training.

The study of Abdelrahman Mohamed Ahmed (Ahmed, 2009) (From Policy to practice: the implementation of ICTs in Sudanese secondary schools in Khartoum) showed that a lot of teachers lacked knowledge and ICT skills due to lack of adequate staff development training courses and incentives regarding the use of ICT in teaching and learning.

Altyeb Mohamad Aljili (Aljili, 2013) in his study "The problems that faces the in-service training of the secondary school teachers" demonstrated that there was no assessment for the real needs of the teachers and no relation between the training contents and the needs of the teachers. Moreover, the training contents were out of date and didn't cope with the modern technology. Also, there was a gap between the training contents and the nature of teacher's work, and there was no clear evaluation strategy at the end of the training.

The study of Amira Hassan Omer (Omer, 2015) "Evaluative Study of Teachers Training Programs for the Use of E-learning at the Secondary School Level in Jabel Awlia Locality, Khartoum State" revealed that there were a lot of constrains that hindered the efficacy of the ICT training courses some of it is the weak infrastructure, there is no follow up for the

trainers at the end of the training and there were no incentives for the trainees who implement ICT in their institutions.

The study of Mahil Mohamed and Atika Y. Elmubarak (Mohamed and Elmubarak, 2015) "The Reality of the Usage of the E-learning Technologies at the College of Education-Sudan University of Science and Technology" supported the result of the other studies; it showed that "there was no periodical training for the staff on the use of e-learning technology".

The study of Elmubarak *et al.* (2016) "The Reality of e-learning constituents in Sudan form Khan's Framework Perspective" exposed that the training courses lacked deliberate planning and considerate organization.

All these studies showed there is a clear problem in the teachers' ICT training and that the training courses were unpremeditated and are only limited to basic computer skills. Besides, there was no training in the pedagogical use of technology. Yet, none of it provided a plan for training the teachers in the use of ICT.

### **A proposed Framework for Developing Teachers' Capabilities in the Use of ICT for Innovative on line Learning**

Teachers need good quality training in using the ICT that is relevant to their own environment, their own needs and level of development. They also need knowledge on how to apply ICT within the curriculum. So, in order to make the teachers' training in the use of ICT tailored to their actual needs, the training should have the following Sages:

#### **Stage 1: pre training stage**

This stage is concerned with evaluating the actual needs of the individual teachers in order to know their level in ICT and their needs, it should contain the following:

1. Collecting data for Needs Assessment: to identify the problem and the gap between the current condition and the desired condition. This could be done through: observation, questionnaires, and judgment interviews (Kizlik, 2010). To identify the:
  - Immediate needs of the teaching staff.
  - Future needs of the students.
2. Conducting in-depth training Needs Analysis: to identify when training should occur and who should attend at each level.
3. Designing and developing effective training program: this should depend on the needs assessment and should aim at achieving certain competences. It should be conducted in a learning atmosphere i.e. interactive teaching and learning.
4. The previous step is the threshold of the paradigm shift from doctrine teaching to innovative education from spoon feeding to interactive learning. This would change the mind-set of the trained teachers and they will convey this to their students. The trained teachers will be able to engage their students and encourage them more in the learning process to:
  - Interact with the teachers
  - Interact with peers
  - Gain more practical experience.
  - Create learner centered education.

## **Stage 2: compulsory training**

The administration should make this stage compulsory to the teaching staff so as to make them computer literate, make them ready for the online education and to enable them to cope with technological era. This stage covers the courses that should be included in the teachers' ICT training. The teachers' enrollment in these courses should be done according to the need assessment. It contains:

### **a. ICDL (International Computer Driving License)**

ICDL is the world's leading computer skills certificate. It covers the skills and competences needed to use computer and common computer applications and knowledge of essential concepts of IT. Moreover, ICDL has tutorial and tests on the Internet, thus, the trainee teachers can always do revision. It covers 7 modules:

- Module 1: Basic concepts of IT.
- Module 2: Using computer and managing files.
- Module 3: Word processing.
- Module 4: Spreadsheets.
- Module 5: Database.
- Module 6: Presentation
- Module 7: Information and communication.

The teaching of the ICDL should show the trainees how to integrate technology into everyday educational practices in a meaningful way to supplement normal teaching processes and resources. The trainer should be integrating technology while teaching the ICDL by using the computer and the internet convincingly to make it appear as a vehicle through which the curriculum can be developed and delivered rather than a separate entity (Williams *et al.*, 1999).

### **The pedagogical use of ICT**

Knowledge and practice on how to apply ICT in the curriculum, and how ICT can support and enhance learning as a natural part of the teaching/learning process (McCarney, 2004). The trainer should practice the e-pedagogy in order to make the trainee teachers learn with and through technology – so that when they choose to use technology, they can do so effectively in a way that helps to improve students' learning (JISC, 2009). It contains the educational programs of the modern teaching methods: Drills, Tutorials, Simulations, Educational games and Problem solving.

They should also learn the general features of these educational programs. At this level they can use the MS office programs they learned in the ICDL course.

### **Web 2.0 Social networking**

It allows for more collaborative education, it gives the trainees public space to interact with each other, with the teacher and with the content of the course. Thus, the social media like Blogs, MySpace, and Facebook should be incorporated into the lessons' planning and delivery to socialize education in order to have paralleled access to knowledge and to share and exchange information, ideas among teachers and students (Richardson, 2010), for example:

- The trainer could use a blog to provide:
  - a. The learning contents.



- b. Questions which the trainees should answer after reading the contents.
- c. Links to references.

The trainees should make their own blogs to:

- a. Answer the questions and to interact with each other.
  - b. Post comments/questions about the contents. This will help in creating discussions and even debates.
- The trainer could make the trainees do e-portfolio to manage their training progress.

### **Netiquette**

Netiquette is the ethical and legal uses of digital information and honesty in using it. It is the rules of correct or polite behaviour among people using the internet for comments in the discussion forums, and for communicating concerns to the instructor (Oxford Advanced Learners Dictionary, 2007). The trainees must learn and know that participants in both synchronous and asynchronous communication should not personally attack others. Personal attacks not only disturb the learning process, but also discourage interactions and collaborations among participants (Khan, 2005, p. 302). Shea (1994) presented ten core rules of netiquette:

- Remember the human.
- Adhere to the same standard of behavior on-line that you follow in real life.
- Respect other people's time and bandwidth.
- Make yourself look good on-line.
- Share expert knowledge.
- Help keep flame wars under control.
- Respect other people privacy.
- Do not abuse your power.
- Be forgiving of other people's mistakes.
- Do assignment with documented quotations (acknowledging authorship, quoting and citing appropriately to avoid plagiarism).

Nevertheless, the ACRL (2002) stated that understanding the ethical and legal uses of digital information requires much more than an awareness of plagiarism and the need to credit one's sources. This includes understanding the following issues:

- Privacy and security.
- Free versus fee-based access to information.
- Intellectual property, copyright, and fair use of copyrighted material.
- Accepted practice for electronic discussion.
- Forms of identification for accessing information resources.
- Institutional policies on accessing information resources.
- Preservation of the integrity of information resources, equipment, system, and facilities.
- The legal obtaining, storing, and dissemination of text, data, images, and sound.
- Plagiarism avoidance by teaching them how to acknowledge the work of others.
- Institutional policies pertaining to the use of human subject in research.
- The use of an appropriate documentation style to site sources.
- The use of permission-granted notice for materials with copy right.

Therefore, the trainer should monitor the language that the trainees use when they send things to each other or when they chat with each other, to make sure that they are not hurting or violating the rights of other people. Also, the trainer should be precise with citation and copyright.

### **Maintenance**

The trainee teachers should have some technical proficiency to troubleshoot the simple technical problems that may face them e.g. they should know how to:

- Check and connect computer accessories and peripherals e.g. mouse, keyboard, monitor, printer, scanner, camera and projector.
- Refresh, reset and restore windows.
- Restore windows to factory setting.
- Restore the system to an earlier point.
- Install and uninstall widow.
- Manage, download, backup and restore lost Microsoft office files.
- Restore lost Microsoft office files from a backup.
- Reinstall Microsoft office.
- Work with Antivirus.

### **Stage 3: optional courses**

This stage is for the teachers who want to develop themselves; the administration should make incentives for the teachers who enrolled in this stage e.g. make score for it in the promotions, give honorable certificates, prizes, financial reward etc. it covers:

#### **Multimedia courses**

The trainees should know how to work with text, graphics, animation, video, audio files, and virtual reality as necessary, because the learning contents may include various multimedia components. It contains:

- Moviemaker
- VideoPad.
- Adobe Photoshop
- Adobe Illustrator.
- Adobe InDesign.
- Adobe Audition.
- Flash

#### **Electronic Curricula design**

It is concerned with how to determine the reliability of electronic sources; how to design:

- Programed curricula.
- Curricula of virtual environment.
- Electronic learning packages.

#### **Instructional interaction software**

Software that automates the learning events. It can be used for the instructional interactions such as content delivery, communication, learning management and assessment that take place

within a learning management system (Savery, 2005). Such as:

- Moodle.
- Blackboard.
- Angel.
- WebCT.

### Specialized computer courses

Courses that are specific for particular specialization e.g.

- Matlab for science teachers.
- corelDRAW AutoCAD for fine arts an engineering teachers.
- SPSS for math and statistics teachers.

### Periodical updating courses

Courses that are intended to train the teachers in the newest developments in ICT to keep them up to date.

**Figure (2): The proposed framework for developing the teachers' capabilities in the use of ICT.**

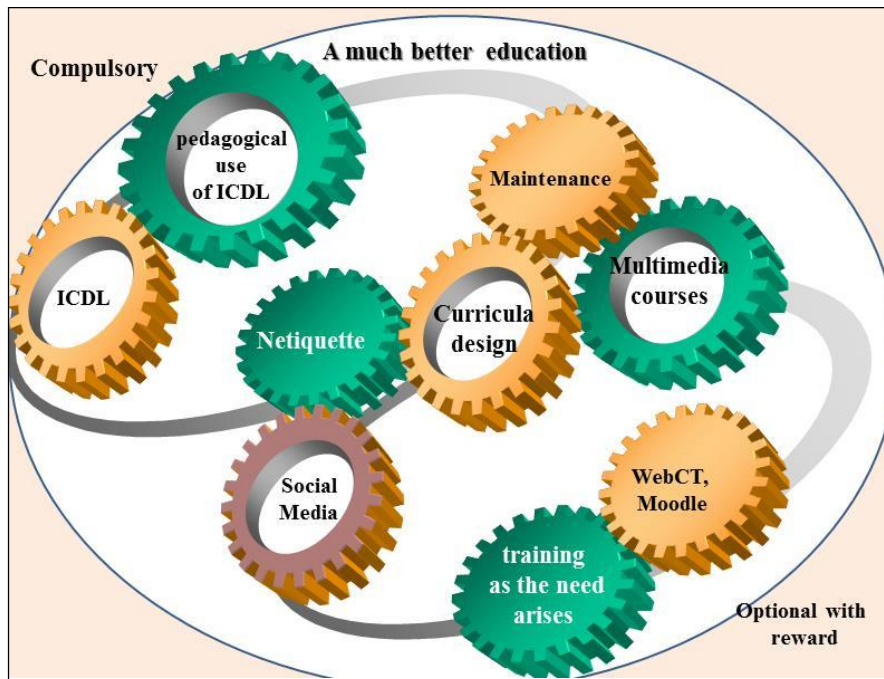


Figure 2: A proposed framework for developing the teachers' capabilities in the use of ICT

**Alongside the training there are some important considerations that should be taken into account such as:**

- Teachers need to know the advantages of using technology so as to be encouraged to adopt ICT where appropriate in their professional lives as teachers, as planners, as managers and as learners (Williams *et al.*, 1999). This could be done by organizing enlightenment seminars; lectures, workshops etc. for providing a rationale for the use of ICT in education and explaining how it can help in providing flexible, easier and more effective teaching and learning process.

- The trained teachers should have sufficient access to ICT so that they will be able to truly realize the potential transformative benefits of ICT integration in education (SchoolNet Africa, 2004).
- It is important to match the mode of delivery and types of training in order to ensure cost effectiveness and successful integration after the training. It is a waste of time, effort and money to teach teachers skills that require complex ICT infrastructure if the tools at their disposal are so basic that they cannot put what they learn into practice i.e. their institutions do not have the computer laboratories and other ICT resources (SchoolNet Africa, 2004).
- Offer a range of detailed case studies from institutions that are already integrating ICT into teaching to aid the development of the training (SchoolNet Africa, 2004), and show how teachers elsewhere have addressed and responded to key educational issues and the ways in which they have sought to translate those studies into curriculum reform (Moore, 2007).
- Making sporting academic entity responsible for assisting the newly trained teachers and responsible for ensuring that they are utilizing ICT in the teaching/learning process.

### **Conclusion**

After the pandemic Covid 19 shift to online learning has become necessary. However, the implementation of online learning must be accompanied by considerable improvements in teachers' competence and confidence in the use of ICT in their subjects teaching (Becta, 2005). Yet, studies indicated that the majority of the Sudanese teachers lack the required ICT competences and the training appears piecemeal, focused mostly on the acquisition of basic computer skills. Thus, unless teachers acquire these competences they will lag behind their students. Accordingly, the students may lack confidence in their teachers.

This study suggested a framework for providing ICT training for the teachers hoping that it would form a foundation for a strategic plan that may prepare the Sudanese teacher for online learning.

### **Recommendations**

- Teachers' training in the use of ICT should be considered as an integral essential part of the human resources development policy.
- Administrations should support instructors who want to be innovative in the way they teach by giving them incentives e.g. better pay and promotion.
- Prepare the training calendars at the beginning of the financial year to guarantee the financial support.
- The training calendar should be organized according to the teacher schedule and announced for them.

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