

Recent Trends in Education in Sudan: Mobile-Learning Model

Mozamel M. Saeed*, Rami Matarneh

Department of Computer Science, Prince Sattam Bin Abdulaziz University,
Al-Kharj, Saudi Arabia

Abstract—

This paper aims to clarify the basic concepts and benefits of mobile learning M-Learning, and try to find a good reference definition of mobile learning. The vision is about how to benefit from the advanced information and communication technology in such a way that can enable the teaching and learning process to meet the challenges and threats of current and future issues, in order to ensure the continuity of survival and the achievement of sustainable development goals.

The paper concluded the necessity need of trying to build and set up a plan for e-learning, depending on a framework in accordance with Sudanese environment which will consist of five components: management, information and communications technology, educational ethics, and evaluation. in addition, the new roles of the educational process in term of its three pillars: the learner, curriculum, and teacher, had been reviewed and discussed.

Keywords— Learning, M-learning, M-learning plan, components of m- learning, Education.

I. INTRODUCTION

The increasing employment of information and communication technologies in various activities became a feature characterizing today's world, based on a new understanding and deeply considering the role of knowledge and human capital in the development of education systems and the progress of society. The information technology is a key element in the nowadays economic growth. The advances in technology and the rapid change in the economy, affect not only in degree and speed of growth, but in most aspects of human life.

The Sudanese education sector, in recent years has seen a significant expansion as a result of the significant increase in the numbers wishing to learn. There is a necessity need for expanding educational services in order to cover this vast amount of scholars. The existing service is showing a clear deficit through physical, human and spatial limitations [1]–[3].

The educational process, in order to achieve the desired development and progress, it must be built on foundations of scientific rules, able to develop and manage educational system, focusing on excellence and workmanship, and investing human resources with a high degree of mastering basic learning of efficiencies and positive societal trends, enabling them to adapt flexibly to variables age, competing vigorously and effectively and contributing to the development of the knowledge-based economy in order to meet the challenges and liabilities imposed on us today, which makes M-learning irreplaceable strategic option. These requirements are [1][4]:

- The need for continuing education.
- The need for flexible education.
- The need for communication and openness to others.
- The current trend to make education not linked to time and place, lifelong education.
- The need to teach based on current need, extracurricular, effective education.

II. DISCUSSION

Mobile teaching and learning refers to a learning style depending on employing information and communication technology to deliver electronic courses within a sourcing module directed to provide a high

level of education service in efficiency and effectiveness, and free from stereotypes and traditional learning. It comes with a number of labels including [5]:

- Education by using network.
- Education by using the Internet.
- Learning at anytime and anywhere.

Mobile teaching and learning can also be defined as a process that is richly interactive environment where applications are dependent on information and communications technology, which enables the learner to achieve the goals of the educational process through interaction with sources [2], [4], [6]:

- In the shortest possible time.
- With less effort.
- With highest levels of quality.
- Without being restricted by limits of space and time.

In this regard, we can draw this concept as follows: Mobile learning is an innovative system to transfer and deliver various types of knowledge and science to become distributed, open and flexible, relying on management integration, information and communications technology, education, evaluation, and ethics of education. It allows active interaction with the learner, curriculum and teacher simultaneously synchronous or asynchronous. There are also some other concepts that are related to the mobile education [3], [7]–[11]:

- Educational technology: According to UNESCO definition: It is a bend system for designing and implementing educational process and straightening, depending on specific objectives stemming from the research results in the field of education and human.
- E-Learning: Is a creative way to present interactive environment, cantered around learners, designed well beforehand, and accessible to anyone, anywhere, anytime using properties and internet sources and digital technologies in conformity with the principles of instructional design suitable for open, flexible, and distributed learning environment.
- Distance education: It is a relatively modern learning methods. The basic concept depends on having a learner in a place different from the source that might be a book or teacher, or even a group of students. It is a transferring tutorial from its position on the campus of the educational institution to geographically spotty. It aims to attract students who cannot under normal circumstances continue in traditional educational program.
- Open education: it is very important to know that the system of open education is a form of distance learning, which attached particular importance to education quality. Unlike the distance the proposed learning system uses a limited proportion (20 -25%), education (face to face) which aims to provide a suitable environment for active learning and direct interaction between scholars.
- Integrated learning: It is one of the formulas of education which integrates e-learning with traditional classroom learning, where e-learning tools are employed (based on computer or network lessons), such as computer labs and smart classrooms where the teacher can meet the student face to face most often.

Technology techniques such as mobile and wireless can be used today for improving learning and education process. M-Learning helps learners share their experiences and views with others in a collaborative environment. Internet has also contributed greatly and widely in enhancing learning activities by providing and linking far distant teachers with learners [12]. And creating an environment that is engaging learners in many activities such as interactions, collaborations, conversations and problem solving.

Both Internet and M-Learning are going to be the state of art for distance learning. Learners can benefit from Mobile devices by carrying them everywhere and obtaining knowledge anytime and anywhere [13]. The major purpose of the coming generation will be how to provide new techniques of learning, training, and education.

However, there are not much of researches done to know the student's requirements or understand what types of mobile applications students need to use on their mobile devices [14]. Mobile devices have contributed in developing mobile applications that can provide rich, highly – localized, context- aware content to users in handheld devices equipped with similar computational power as a standard PC. This rapid increasing

of mobile devices in the last five years has dramatically altered the platform for business, social, gaming, entertainment, marketing and productivity.

2.1 Benefit of M-Learning

Some advantages of mobile education can be drawn as follows [15]–[18]:

- 1- The efficiency: Recalling information depends on our sensory capabilities, while the response depends on the individual features and learning impulse. It is therefore imperative for the transferring posts to provide the replicability for the learner, according to different sensory modalities, which can rarely be provided by the traditional educational methods, giving the opportunity for learners to interact immediately electronically among themselves and between them and the teacher in the other way, through the means of Email, discussion boards, chambers of dialogue and so on.
- 2- Less expensive: The cost of mobile devices is much less than the personal computers and laptops.
- 3- Easy access to curriculum: mobile learning curricula are available all the time, allowing the learner to follow it, through his machinery at any time, overcoming the constraints of space and time in the learning process.
- 4- Enhancing participation: The learning theories enhance the participation, that human interaction is considered as a vital element in the learning process. It is noteworthy, that mobile learning provides such participation across rows default chat rooms, educational emails, and export files from the learning platform to mobile phone and other activities.
- 5- The integration: Integration provides mobile learning for the learner, and provides the knowledge and learning resources in an integrated manner, through assessment tools that allow the analysis of learner's knowledge and the progress that he achieves.
- 6- The flexibility: The learner can work with a large group of teachers who are in various parts of the world, through his machinery by using internet at any time that is matching with his agenda. And can therefore learn at home or at work or anywhere which allows him to use the Internet at any time.
- 7- Taking into account the situation of the learner: The mobile learning can offer the possibility of choosing speed pace of learning, which means the learner can speed up or slow down the learning process as needed. It also allows him to choose content and tools that fit his interests and needs and the level of skills, especially if it involves several teaching methods which adopt various methods to transfer knowledge to different learners, which makes it more effective for some, and it enables the student to receive Scientific material in a manner commensurate with his abilities through Visual, audio manner or read, etc. Taking into account the individual differences among learners and enabling them to complete the learning processes in suitable environments for them, according to their own capacities.

2.2 Challenges of M-Learning

Technical challenges for m-learning include: connectivity and battery life, screen size and key size, meeting required bandwidth for nonstop/fast streaming, number of file/asset formats supported by a specific device, content security or copyright issue from authoring group, multiple standards, multiple screen sizes, multiple operating systems, reworking existing e-learning materials for mobile platforms, limited memory and risk of sudden obsolescence [19].

While social and educational challenges for m-learning include: accessibility and cost barriers for end users (digital divide), how to assess learning outside the classroom, how to support learning across many contexts, content's security or pirating issues., frequent changes in device models/technologies/functionality etc., developing an appropriate theory of learning for the mobile age, conceptual differences between e-learning and m-learning, design of technology to support a lifetime of learning, tracking of results and proper use of this information, no restriction on learning timetable, personal and private information and content, no demographic boundary, disruption of students' personal and academic lives, access to and use of the technology in developing countries and risk of distraction [20].

2.3 Mobile Technologies for M-Learning:

Mobile technologies are an attractive and easy means to maintain literacy skills and gain constant access to information. They are affordable, can be easily distributed and thus hold great potential for reaching

marginalized groups and providing them with access to further learning and development. Mobile technologies facilitate distance learning in situations where access to education is difficult or interrupted because of geographical location or due to post-conflict or post-disaster situations. Mobile devices and personal technologies that can support mobile learning include [22]:

- E-book
- Out start, Inc.
- Handheld audio and multimedia guides, in museums and galleries.
- Handheld game console, modern gaming consoles such as Sony PSP.
- Personal audio player, e.g. for listening to audio recordings of lectures (podcasting)
- Personal Digital Assistant, in the classroom and outdoors
- Tablet computer.
- UMPC, mobile phone, camera phone and Smart Phone.

Technical and delivery support for mobile learning include:

- 3GP for compression and delivery method of audio-visual content associated with Mobile Learning.
- GPRS mobile data service, provides high speed connection and data transfer rate.
- Wi-Fi gives access to instructors and resources via internet.
- Cloud computing for storing and sharing files.

And also, we need baseline requirements for mobile technologies that support learning outside of school settings. These technologies should be:

- 1- Highly portable: The technology is available whenever the user needs to learn.
- 2- Individual: The technology can be personalized to suit the individual learner 's abilities, knowledge and learning style, and is designed to support personal learning rather than general office work.
- 3- Unobtrusive: The learner can capture situations and retrieve knowledge without the technology becoming overly noticeable or imposing on the situation.
- 4- Available: The learner can use the technology anywhere, to enable communication with teachers, experts and peers.
- 5- Adaptable: The technology can be adapted to the context for learning and the learner's evolving skills and knowledge.
- 6- Persistent: The learner can use the technology to manage learning throughout a lifetime, so that the learner's personal accumulation of resources and knowledge will be immediately accessible despite changes in technology.
- 7- Useful: The technology is suited to everyday needs for communication, reference, work and learning.
- 8- Easy to use: The technology is easily comprehended and navigated by people with no previous experience using it.

III. CHANGING ROLES IN THE NEW KNOWLEDGE AGE

The revolution in information and communication technology in the world, require us to move quickly and efficiently, in order to catch up with this revolution, for this reason, it is important to change education objective which is for all, to the excellent education and excellence for all [19]–[23], Adding the following new objectives (see Fig.1):

- Use of information and communications technology in schools and homes for all students and teachers.
- Use of information and communication technology by all teachers in an effective way in order to help their students to achieve high academic standards.
- Enabling all students to acquire information and communication technology skills.
- The research and calendar of the duty looking forward to undertake the duty of improving the next skills application.
- To achieve these objectives, the matter requires a change in the traditional education trilogy (teacher, learner, school) and turn it into a more modern educational process.



Fig. 1 Mobile-learning model

First: The teacher.

Developing the skills of the teacher, through providing him with training programmes in technology, education and modern methods of explanation, which will support the spread of information technology and utilizing it properly in the development of the education system as a whole [24]. Characteristics and specifications of the teacher:

- A singularly and typical teacher.
- His disagreement with others is considered as a source of information.
- A facilitator.
- Marching the critical thinking for learning.
- Capable of lasting self-learning.

New roles for the teacher:

- Constant and critical friend.
- Creative and innovative, Commander
- Discussions.
- Archetype and consultant.
- The controller and the wave.

Secondly: the learner.

The traditional role of the pupil changes from limited participation: concluded in keeping the information in the adopted curriculum and textbooks, storing it in memory, and calling it at exam time to be more effective, more creative and a key partner in the educational process [25]. The positive role of the learner:

- An active participant, creative, discusses and interviews.
- Presents his ideas with boldness and freedom.
- Criticizing current ideas and displays other alternative ideas.
- Capable of interacting with modern technology.
- He can make up mind to make his own decision.
- Acquire thinking skills, creativity and excellence.
- Contribute to the production of knowledge and development.

Thirdly: educational institution.

There must be a new structure to rescue the nation from deterioration and promote progress through adopting the educational tree instead of educational ladder. The concept of the educational tree means that: living entity has perpetual motion and growth, beside that one trunk is the basic education then the learner climbs the twigs and branches according to his desire and ability.

3.1 Mobile learning components:

There is a set of basic components needed to implement successful mobile education system, starting from the stage of adopting the idea through implementation and development and down to the calendar, the redevelopment and improvement. Each of these components has a number of branches to cover a specific partial mobile education [26]–[27], which can be marked through a comprehensive scientific based mobile education strategy adapted to the Sudanese environment. These components are:

- 1- Management component: Contains a number of principles of financial Department, admissions and registration, Alumni Affairs, student services, personnel service, e-learning service, quality and service recognition.
- 2- Information and communication technology component: Contains a number of principles including, infrastructure, devices, networks and communications, software (design, content, Web design, etc.), standard setting, technical support.
- 3- The learning component: Contains a number of principles including content analysis, learning strategies, learner, instructional support psychology, design trends, regulation.
- 4- The learning ethics component: Contains a number of principles including different cultures, different time, with special needs, the digital divide (who owns and who doesn't), network etiquette, fraud and hacking content and exams, intellectual property rights.
- 5- Evaluating component: Contains a number of principles including content and design calendar, calendar mobile learning environment for learners and learners' evaluation.

From the previous discussion we came up with the following results:

- The provision of M-learning requires management and enlightened leadership to be responsible for providing financial and technical support and technological infrastructure, there for, there must be a national council for the E-learning.
- The provision of M-learning requires teachers training and preparing curriculum and students scientifically sound, so, there must be a centre or town or national university for M-learning to be responsible for the evaluation of the educational process in a continuous manner.
- To achieve an effective E-learning to be successful, it is necessary to build a plan for E-learning that is adapted to the Sudanese environment.
- Directing educational research and technical educational research in research centres and universities to serve the development of software to share in the computerization of the curriculum and building educational applications.
- Adoption of the definition and concepts contained M-learning paper, help to spread and build a framework that will serve a well- defined strategy and features in Sudan.
- Adoption of M-learning comments contained the paper to be a framework for a plan to build M – learning in Sudan.
- Ensure inclusive education Policy-makers should ensure that mobile learning policies promote gender equality and accessibility for learners with disabilities. This effort is essential to meeting EFA goals of providing quality education to all learners worldwide.
- ICT is a powerful vehicle for enhancing learning, and mobile devices form an essential part of that vehicle. If current ICT strategies for education begin to include mobile devices along with digital learning materials, support for teachers, and guidelines on best practices, mobile learning will soon become an important part of education.

IV. CONCLUSIONS

M-Learning makes the merge and connection between technology and education possible. The learner includes nomadic, institutional, home, children and adult users and the variety of learning environments includes

standalone, schoolroom, networked, internet-based, nomadic, distance, collaborative, asynchronous and synchronous will arise the interest of the new generation of distance learning (M-learning). The paper has discussed the background of M. Learning and how it can be used to enhance the whole learning system. The paper also provides highlights of the benefits and future challenges of M-Learning in our educational environments. Finally, our learners, instructors, students and teachers should be prepared for the next generation of learning and training. The development of a mobile infrastructure for the provision of nomadic learning will meet this need and opening new scenarios for both the developing e-learning and the telecommunication industry. M-learning can be used to solve the traditional learning system problems. Both teachers and students need a proper and handy system to interact with each other and facilitate the teaching system. 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.

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