Challenges and Benefits in Implementing M-learning in Pre-university Education in Egypt

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Abstract. Revolution in mobile technologies can lead to a change paradigm in education. Mobile learning is believed to have the potential to be used in teaching and learning in schools. Mobile learning (m-learning) is a field that involves the use of mobile computing and wireless technology to enable learning anytime and anywhere. The intention of this paper is to identify the challenges and issues in implementation of mobile learning in a pre-university education in Egypt and explores the benefits resulting if this system is implemented. Several issues prevailing in a traditional pre-university education in Egypt have been identified and describing a mobile learning as an innovative technology for better education in Egypt.

Keywords: Benefits, Challenges, Egypt, Egyptian education, M-learning, tablets in education.

Introduction

The IT infrastructure has been developing significantly and will continue to develop in future [1]. Children from early childhood have Smartphone and tablet PCs. Currently, even a child in grade 1 is using computers and tablets [2]. The rapid development of information and communication technologies (lCT) and revolution computer knowledge of the students make possible appearance of new educational methods and providing new ways for knowledge generation, develop, enhance and expand learning activities [3, 4]. Schools have the responsibility of preparing students for life, but there is an increasing gap between what occurs in schools and the experiences of students out of school. Often, there is a digital divide between school and home. Digital divide means unequal access to computers, the Internet, and online information, whether among individuals, communities, or countries. Many students in home acts with technologies for a long time but in school environment, is minimal use of technology. Therefore, more schools are moving toward using mobile learning in the classroom as a way to take benefit of revolution of electronic devices that offer portability and ease of use on a budget.

Despite m-learning has a success stories in some Arab countries [2, 5, 6], it needs more investigation in Egypt. El-Gamal [7] analyzed the e-learning and mobile learning trends within the next ten years. El-Gamal [7] expected that e-learning practices are the current trends that could last for two-five years. Practices include open source learning applications, social media, e-textbooks, and so on. Mobile learning is not expected to be fully adopted in Egypt before five years. El-Gamal [7] asserts that the educational system in Egypt needs a faster upgrade and reform. Curricula, teaching methods, qualifications frameworks, training, and quality assurance are all important factors that should be modernized in order for better adoption of mobile learning. This paper focuses on the issues and challenges in implementing m-learning in pre-university education system in Egypt and the expected benefits as a result of successful implementation of the system.

Mobile Learning (M-learning)

A mobile media revolution is changing the lives of people. In everywhere, we can see cell phones, smartphones, tablets, PDAs (personal digital assistants), MP3 players, portable game devices, laptops and netbooks abound [8]. Cell phones have evolved to smartphones with PDA features, web browsers, e-mail, cameras and video capabilities. Laptops have gotten lighter, with longer battery life, and are capable of connecting wirelessly to high speed networks at thousands of public Wi-Fi access points, called ''hot spots,'' and increasingly in homes with wireless broadband [9].

Despite the evolution of possible uses of mobile and wireless technologies for learning in the last few years, there is no consensus reached yet in the academic and professional community about m-learning definition [9]. According to [10], a commonly accepted definition of m-learning is ''using mobile technologies to facilitate learning.''. Traxler [11] believes m-learning is sometimes seen as an extension of e-learning, in other words, it is seen as an e-learning initiative accomplished through the use of mobile devices. In other cases m-learning is deemed to be something different from e-learning exactly for trying to overcome some of its limitations, such as barriers of time and space imposed by a ''fixed'' technology, or one that uses desktop computers [9].

More than the simple use of mobile and wireless technologies for learning, it is important to differentiate m-learning from other practices or teaching learning modalities. According to a group of authors [11, 12, 13, 14, 15] m-learning can be characterized by its ability to increase the independence because the learning is focus on the individual, continuity and connectivity among contexts when the student moves through a certain area. M-learning can provide the student with the possibility of taking advantage of moments, spaces and any given opportunity to learn in unplanned way with their interests and needs. So, it is considered that m-learning refers to learning processes supported by the use of mobile and wireless information and communication technologies which have as a fundamental characteristic the students' mobility, who may or may not be physically or geographically distant from one another and also from formal educational spaces, such as classrooms, instruction and training rooms or work place [9].

M-learning system consists of technology, stakeholders, and the appropriate pedagogy to meet the educators' and learners' needs [35]. Figure 1 depicts m-learning system in pre-university education [33]. The stakeholders in m-learning system in higher education are the students, faculty, and university administrators and staff [33]. Each of them has its own view of the system and each might have different preferences for what the system should do or look like [33]. Since we are talking about m-learning system for pre-university students, the stakeholders will become students, parents and schools administrators and teachers. For a mobile learning system to be effective, all stakeholders should work together and support the main goal of the enhancement of learning for the student. Technology is a significant part of the m-learning system [33]; infrastructure, device features and interface, and service quality. Pedagogy which is composed of the content, curriculum design, and student learning styles is the final component of m-learning. Each of the pedagogy components influences the other based on the m-learning paradigm [33]. Student learning styles should be included into designing the content and the curriculum for better delivery of a personalized educational experience [34].
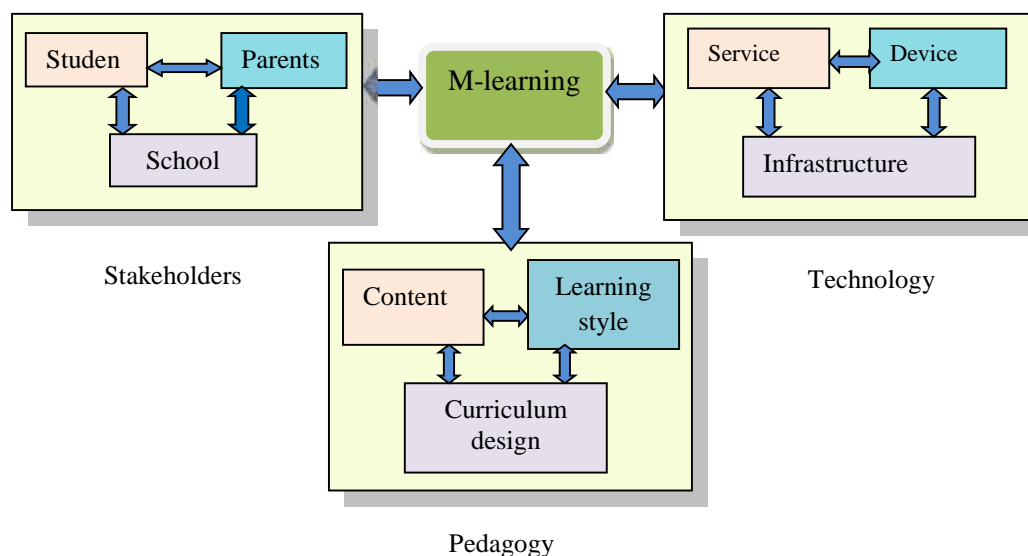
Figure 1. Mobile learning System Components in Pre-university Education

Egyptian Pre-university Education System

Quantitatively, according to World Development Indicators Database from World Bank [16], Egypt has made great progress in achieving the Millennium Development Goal of universal basic education; the gross primary school enrollment ratio in 2007 was 100% [16]. However, the situation is different when you are talking about qualitative indicators. Still the quality of education experience is low and unequally distributed [17]. The Egyptian pre-university education system is the largest in the Middle East and one of the largest worldwide. The pre-university education system is expected over the longer term to make a significant contribution to Egypt's economy and to play an essential role in increasing its national income [17].

The Egyptian pre-university education systems are facing some challenges such as: Poor teaching quality and dependence on private teacher, Pedagogical methods and teaching approaches are also problematic (memorization and rote-learning), Retention and School Dropouts (School dropout rates are high, especially for females, despite free and subsidized tuition. Many choose to avoid the costs for transportation, private tutoring (which is becoming customary) and other study requirements and accessories), lack of learning materials, library books, facilities and equipment, increasing classroom density and limited availability of classrooms [17].

Mobile Devices Status with Children in Egypt

Since we are talking about applying mobile learning in pre-university education, it is necessary to talk about the state of children in Egypt with mobile. A study by NTT DOCOMO and GSMA [18] involving 1,030 pairs of children and guardians living across 12 geographic locations representing the Egyptian community both geographically and demographically, children between the ages of eight and 18 were surveyed. The amount of valid responses collected was 1,050 pairs, representing an 81 per cent success rate. And produce the following data: For mobile phone ownership rate 91% of children own a mobile phone, reaching to over 80% by age 12, 16% of all children with a mobile phone own a Smartphone and 19% of all children surveyed use a tablet. For use of mobile phones, 68% of children use their mobile phones for both calling and messaging. For mobile internet, 55% of children who use a mobile phone to access the internet; this increases to 94% when looking exclusively at child smartphone users. For Mobile apps use, 66% of children who access the internet via their smartphone download or use apps, entertainment apps are the most popular at 69%, followed by education and learning apps at 32%. For social networking on mobile phones, 47% of child mobile phone users are access social networking and micro-blogging sites on their phones.

For parental concerns and mobile safety 78% of parents expressed concerns about children's privacy when using mobile phones, 51% of child mobile phone users have set a password/PIN for their mobile phone and 65% of parents have introduced rules on their children's mobile phone use. 87% of children surveyed say that having a mobile phone increases their confidence.

Previous results indicate that children in Egypt have strong relationship with mobile devices and using it increases their self-confidence. Hence the applying mobile learning in Egypt may make progress in education.

M-learning as an Innovative Technology for Better Education in Egypt

Mobile learning introduces new pedagogies and styles of learning, enabling education within the real contexts of students and hence more personalized and self-directed; more informal, that is, outside the limitations of formal curriculum, assessments and classroom practices; and more flexible in terms of when and where it can take place [19]. Through mobile learning, students can learn with each other without any authority to any individual and students can be a source of knowledge or create their own content in contrast to traditional pedagogical models based on the teacher transferring knowledge to learners without any participation from the students [20]. Learners can better understand and apply concepts through discussion with peer classmates and this is called collaboration. M-learning can support the concept of collaboration between students through share knowledge with peers, share different learning paths and evolve better answers. Traditional classroom environments often do not allow this, especially with large class sizes or when students far from one another [21].

Teacher can use mobile devices for one to one interactive activities with the students by having a quick survey, quiz or in subjects that needs simulations such as science and mathematical, making this a good choice to deliver the knowledge in a way that is more enjoying and easy to understand for the students [2].

Mobile learning does not require students to be physically present in a classroom in order to learn and doesn't need specific times for learners to be available in a classroom to be taught by teachers. Because mobile phones are reachable to communities in distance areas, they also extend the reach of mobile-enabled educational resources [22]. Mobile learning provides teachers and students with much more flexibility than a lab model because the small laptops can be used anywhere, so students don't need consume time in the movement to and from classrooms and labs and this will decrease in the number of rooms [2].

Issues and Challenges of Applying M-learning in Egypt

The students' acceptance and perceptions to implement mobile learning is important to determine the attitude of students towards the use of mobile technology in education [23]. According to [24], students still find some technological limitations that may lead to less-successful incorporation of mobile learning. The successful implementation of mobile learning in schools is dependent on acceptance of mobile learning by students [23]. The adoption of mobile device is not the same in all countries [25]. Therefore, the researchers should investigate this case by case in a specific country. In Egypt, there is no studies have analyzed the acceptance of mobile learning in the classroom for pre-university education, as the studies have been on university students such as [26, 27].

Another factor is a lack of awareness of the usefulness of m-learning among population especially among parents [28]. Many parents prefer traditional method of learning [28]. Additionally teachers, administrators and parents appears concerns about the bad uses of mobile phones such as cheating, access to sexual websites and cyber-bullying. This makes many institutions to ban the use of mobile phones on school [20].

Lack of content, in order for mobile learning to be effective, it must be developed and implemented properly [23]. The responsible for the educational process must change the method of design and deliver the materials and activities [23]. Current Pedagogical approaches that are dependent on memorization of facts and rote-learning, which works against creativity, innovative thinking and knowledge creation, are not

appropriate for mobile learning and for the new generations of learners. There must be an instructional paradigm shift that promises to fundamentally change the way students learn [20]. And lack of necessary skills in the workforce to adapt content into mobile form such as: mobile application developers in creating and presenting good and attractive content [29]. Also, there is a need to develop applications and materials in Arabic because the language of instruction in Egyptian public schools is Arabic [29].

Infrastructure and access is an important factor. Although there are many initiatives and programs, the current technological infrastructure is still insufficient in Egypt [30]; about 2000 schools from the total 52000 primary and secondary schools were connected to the high-speed Broad Band Internet [29]. Another barrier to implement m-learning in Egypt is the larger population of teachers lacks proper ICT training and awareness to embrace the mobile learning shift [30].

Currents Mobile Learning Initiatives in Egypt

Mobile Content Development

In June 2010, ITIDA in partnership with Vodafone Egypt launched a "MobileAppsAcademy" in the search for developers and entrepreneurs to develop innovative mobile applications for the growing smartphone market in the Middle East and North Africa region (MENA) [29]. This initiative aims to prepare Egyptian developers to compete for this market. The MobileAppsAcademy offers a variety of services and advantages, including access to training, facilities, business start-up advice, and funding, in exchange for entrepreneurs sharing their ideas and opportunities for creating mobile applications [29].

ITIDA and its partners are not the only Arab organizations to see the opportunity for what has been characterized as a mobile application development market worth US$ 6.2 billion worldwide in 2010 and projected to grow to US$ 29.5 billion by 2013. Private entrepreneurs are also entering the market. For example, Kotob Arabia is a Cairo based on-line publisher of more than 4,000 Arabic language e-books. The market is ready for a mobile platform that meets the needs of Arabic language speakers [29] because the high levels of mobile phone diffusion in Egypt and the high price of digital e-book readers [29].

Plan of the Ministry of Education to implement the project «Tablet» in the governorates of the republic:

The Ministry of Education plan to implement the project «Tablet» the governorates of the republic, in phases, starting from the fiscal year 2013 - 2014, and continue until the fiscal year 2015 – 2016 [31] and for the content for tablet, content is developed by the "E-learning Center of Excellence" at the Information Technology Institute (ITI), which is affiliated with Egypt's Ministry of Communications and Information Technology [32]. Implementing the pilot project is a first action step towards transforming the entire content of the national school education system into E-content that is accessible through tablets. The next phase of this project will include the training of the teachers to develop content by themselves [32].

Conclusion

The traditional Egyptian pre-university education systems are facing some challenges. Mobile learning introduces new pedagogies and styles of learning can support to the traditional education system to help solve problems within it. When implementing a new technology, some challenges and issues that needs to be addressed for that technology. In this paper, we discussed challenges and issues raises when implementing mobile learning in pre-university education in Egypt. In addition we explain the benefits of applying mobile learning and the currents mobile learning initiatives in Egypt.

References

[1] S. M. Ali, Challenges and security issues in future IT infrastructure components. International Journal of Computers & Technology, 2013 8(2), 845-847

[2] S. M. Ali, Challenges and Benefits of Implementing Tablets in Classroom for e-Learning in a K-12 Education Environment – Case Study of a School in United Arab Emirates. International Journal of Engineering and Science, 2012 3(4), 39-42

[3] I. A. Qureshi et al. Challenges of implementing e-learning in a Pakistani university. Knowledge Management & E-Learning: An International Journal (KM&EL), 2012 4(3), 310-324.

[4] F. Michau et al. Expected benefits of web-based learning for engineering education: examples in control engineering. European Journal of Engineering Education, 2001 26(2), 151-168.

[5] Sabq. Launching the iPad project (Limitless Knowledge) at Saudi Schools 2013. Available from http://www.sabq.org/AcCfde [Accessed on 29 May 2015].

[6] M. Ally et al. Use of emerging mobile computer technology to train the Qatar workforce. Qatar Foundation Annual Research Forum Proceedings: 2012, CSP6. Available from http://www.qscience.com/doi/abs/10.5339/qfarf.2012.CSP6 [Accessed on 29 May 2015].

[7] H. R. El-Gamal. The power of e-learning for Egypt: A spot light on e-learning. A reportvby GNSE Group 2012. Available from http://www.gnsegroup.com/news/The_Power_of_elearn-ing_for_Egypt_ver01.pdf [Accessed on 29 May 2015]

[8] N. Martin-Dorta et al. Web-based spatial training using handheld touch screen devices. Journal of Educational Technology & Society, 2011 14(3), 163–177

[9] A. Freitas and S. Eliane. Mobile Learning: Definition, Uses and Challenges In Increasing Student Engagement and Retention Using Mobile Applications: Smartphones, Skype and Texting Technologies. 2013 pp.47-82.

[10] G. J. Hwang et al. Development of a ubiquitous learning platform based on a real time help seeking mechanism. British Journal of Educational Technology, 2011 42(6), 992-1002.

[11] J. Traxler, The evolution of mobile learning. In R. Guy (Ed.), The evolution of mobile teaching and learning Santa Rosa: Informing Science Press 2009 pp.103–118.

[12] A. Kukulska-Hulme. Mobile usability in educational contexts: What have we learnt? The International Review of Research in Open and Distance Learning, 2007 8(2).

[13] M. Sharples et al. Mobile learning: Small devices, big issues. In N. Balacheff, S. Ludvigsen, T. de Jong, A. Lazonder & S. Barnes (Eds.), Technology enhanced learning: Principles and products. Heidelberg:Springer. 2009 pp. 233–250

[14] M. Sharples, The design of personal mobile technologies for lifelong learning. Computers & Education journal, 2000 34, 77–193

[15] N. Winters, What is mobile learning. In M. Sharples (Ed.), Big issues in mobile learning. Report. University of Nottingham. Available from http://www.lsri.nottingham.ac.uk/ Publications_PDFs/BIG_ISSUES_REPORT_PUBLISHED.pdf. 2007 [Accessed on 29 May 2015].

[16] World Bank. Arab Republic of Egypt Improving Quality, Equality & Efficiency in the Education Sector, Fostering a Competent Generation of Youth, 2007 1-64.

[17] L. Loveluck, Education in Egypt: Key Challenges. (Background Paper). Chatham House 2012. Available from
http://edoc.bibliothek.unihalle.de/servlets/MCRFileNodeServlet/HALCoRe_derivate_00006128/CH_0312eg yptedu_ background.pdf Accessed on 29 May 2015

[18] GN. DOCOMO, Children's Use of Mobile Phones-An International Comparison, 2013. GSM Association and Mobile Society Research Institute.

[19] M. Sharples et al. A Theory of Learning for the Mobile Age. In R. Andrews and C. Haythornthwaite (eds), The SAGE Handbook of E-learning Research. London, SAGE Publications. 2007 pp. 221–247

[20] S. sacs, UNESCO Working Paper Series on Mobile Learning, United Nations Educational, Scientific and Cultural Organization. Turning on mobile learning in Africa and the Middle East: Illustrative initiatives and policy implications. 2012

[21] V. Pandit et al. Transforming learning through mEducation. 2012, McKinsey & Company. GSM Association and Mobile Society Research Institute

[22] J. H. Valk et al. Using mobile phones to improve educational outcomes: An analysis of evidence from Asia. The International Review of Research in Open and Distributed Learning, 2010 11(1), 117-140.

[23] M. Ally, Mobile learning: from research to practice to Impact Education. Learning and Teaching in Higher Education: Gulf Perspectives, 2013. 10(2).

[24] S. Al-shehri, Mobile Learning in the Arab World: Contemporary and Future Implications, in Interdisciplinary Mobile Media and Communications: Social, Political, and Economic Implications: Social, Political, and Economic Implications. 2014. p. 48.

[25] K. Jairak et al. An acceptance of mobile learning for higher education students in Thailand. in Sixth International Conference on eLearning for Knowledge-Based Society, Thailand. 2009.

[26] S.M. Attalla et al. Screening of Students' Intentions to Adopt Mobile-Learning: A Case from Egypt. International Journal of Online Pedagogy and Course Design (IJOPCD), 2012. 2(1): p. 65-82.

[27] A.A. Amer and Abdel Hafez H. Mobile learning concepts and its effects on student's attitudes in Egypt. in Computer Engineering Conference (ICENCO), 2011 Seventh International. 2011. IEEE

[28] W. E. Hassan and G. H. El-Rify. eLearning in Egypt -Challenges and Imperatives: Considerations of (Design Education) eLearning Courses In Egypt. in 7th International Conference on e-Learning 2013. Chinese University of Hong Kong.

[29] Minister of Communications and Information Technology, Egypt. ICT Policy Review - Egypt. Geneva: United Nations Conference on Trade and Development (UNCTAD) 2011

[30] A. Hamdy. Survey of ICT and Education in Africa: Egypt Country Report. 2007.

[31] UNESCO Education for All 2015 National Review Report: Egypt 2015 Available from
http://unesdoc.unesco.org/images/0022/002299/229905E.pdf. [Accessed on 29 May 2015].

[32] A. Atef. Interactive Mobile Learning Content for Schools. 2013 Available from: http://www.checkpoint-elearning.com/article/12812.html. [Accessed on 29 May 2015].

[33] H. Akour. Determinants of mobile learning acceptance: an empirical investigation in higher education. PhD. Thesis, Oklahoma State University. 2009

[34] D.J. Muir. Adapting online education to different learning styles, in National Educational Computing Conference, "Building on the Future". 2001: Chicago.

[35] L. Naismith et al. Literature review in mobile technologies and learning. Futurelab Series. 2004 available from http://www.futurelab.org.uk/resources/documents/lit_reviews/Mobile_Review.pdf [Accessed on 29 May 2015].