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

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ABSTRACT : *In the recent past, there has been an increase in the trend to integrate technology into education in an attempt to enhance and improve traditional teaching methodology. A great deal of research has already been done to prove the usefulness of e-learning and m-learning in both secondary and higher education environment. Several countries including but not limited to United States (US) and New Zealand (NZ) have already implemented e-learning systems in K-12 educational institutions. Following the trend, countries in Arabian Gulf including United Arab Emirates (UAE) are moving towards e-learning and m-learning as an initiative to cope with the latest technology and pedagogy trends of the developed nations. The intention of this study is to identify the challenges and issues in implementation of tablets for e-learning in a K-12 education environment and explores the benefits resulting if this system is implemented successfully from UAE's perspective. For this study, several issues prevailing in a private school in UAE for the implementation of e-learning using tablets have been identified and expected benefits after the successful implementation of the system are being discussed through empirical evidence and discussion with the school's administration, teachers and information technology (IT) staff.*

KEYWORDS : *e-learning, k-12 education, m-learning, tablets in education, UAE Education*

I. INTRODUCTION

The IT infrastructure has been experiencing exponential growth and will continue to grow in future. [1] Smartphone and tablet PCs are in hands of children from early childhood. Nowadays, even a kid in grade 1 is using computers and tablets. The vigorous growth in IT has made it promising and a necessity for learning to transpire rapidly. [2] New and latest technologies are providing new ways for knowledge generation and to develop, enhance and expand learning activities. [3] There has been an increasing trend to introduce e-learning in educational institutions to provide students with access to online learning systems and teachers administered course management systems in order to access learning materials and documents. The major reasons behind this trend are the change in conditions of students' demographics, delivery of education and the technology innovation.[4] In fact, many educational institutes such as UAE university, has provided students with laptop PCs and tablets and making it mandatory for them to use it to aid their study. [5] This study focuses on the issues and challenges in implementing tablets for e-learning in a K-12 education environment and the expected benefits as a result of successful implementation of the system from UAE's perspective. This paper is divided into 5 sections. Section 1 has given the introduction to this study. Section 2 will throw the light on the definitions of e-learning in the literature. Section 3 will discuss about the challenges and issues in implementation of e-learning using tablets. Section 4 will explore the benefits that are expected to be achieved as the result of successful implementation of tablets for e-learning in a classroom environment. And finally the conclusion part will summarize the findings of this study and concludes.

II. E-LEARNING

The term e-learning has been in use from a decade now and several definitions have been formulated to refer to it. According to [6], e-learning is defined as "Learning facilitated by internet and www technologies, delivered via end-user computing that creates connectivity between people and information and creates opportunities for social learning approaches. Another definition given by [7] is, "Distance education using internet and/or other information technologies". For this study, the author concludes from various definitions that e-learning is a model, resulting from the use of information and communication technology (ICT) to enhance, improve and/or support traditional teaching methodology and practices.

III. SCHOOL BACKGROUND

The American International School (AIS) Dubai, UAE is a private, independent educational institute that serves students from Kindergarten to Grade 12. It meets global standard of education and follows both American as well as UAE curriculum. It has been accredited by AdvancED (formally CITA) United States, as well as Knowledge and Human Development Authority (KHDA), Government of Dubai, UAE. [8] Currently AIS has student strength of more than 2000 students from more than 25 different nationalities. AIS have 96 classrooms, 50 administration and teachers' rooms, 3 computer laboratories and 2 computerized examination halls for online and web-based quizzes and exams. The school is having more than 450 client personal computers (PC) throughout the school. AIS being heavily dependent on information technology (IT) has a dedicated IT staff of 5 persons. In order to cope with the technological advancements and to enhance and improve the standard and methodology of teaching, AIS decided to introduce tablet PCs in classrooms to all the students from Grade 1 to Grade 12.

IV. CHALLENGES AND ISSUES

The author has been associated as a consultant for tablets implementation in classroom at American International School, Dubai-UAE. The author had been involved in several meetings and discussions with the stakeholders including teachers, IT staff, and top management including Director and vice principal of the school for this project. Several challenges and issues were identified as a result of brainstorming, stakeholders' views and empirical evidences. The issues and challenges identified were being classified into following categories:

4.1 Social Issues

One of the most important challenge in implementing e-learning or use of technology for education is that most if not all software / applications' user interface (UI) are developed in English. Although majority population of UAE locals speaks and understands English, still in AIS, there were teachers from several nationalities from various Arab countries and many of them can only understand Arabic. Therefore teachers' training to use the classroom management system in English needs to be done or to develop applications and materials to be custom developed in Arabic in order for this project of implementing tablets in classroom for e-learning a success.

4.2 Pedagogy Issues

Therefore one of the major issues was the mobile device management (MDM) of tablets within the classroom. Usually MDM is being carried out and managed by IT staff, but in the case of school, they wanted to give access to the teachers to manage students' tablets in their classroom. Another issue was the class control, as students with the tablets could be playing games, use social networking sites or just waste their precious classroom time. In order to address these issues, the school had to go for a classroom management system through which teachers can control students' tablets and can make sure that they are not playing or wasting the time during the class time.

4.3 Technological Issues

The main issue in implementing tablets for e-learning in a classroom environment is the implementation of a reliable, sustainable and expandable wireless network infrastructure. The old infrastructure of the school constituted only wired local area network (LAN). But in order to implement tablets in classrooms, there was a need of a wireless LAN so as to get the actual benefit from this project. So the school had to hire a dedicated team of technology professionals experienced in network design and implementation to setup wireless LAN. Another challenge was to make compliance and governance policy for battery charging and maintenance of tablets. Since students will be carrying their e-books in their tablets, the school had to make sure that all the students get their tablets fully charged before entering into classroom because having no charge in tablets is the same thing as if student had left his textbook at home.

V. BENEFITS OF IMPLEMENTING TABLETS

The aim of AIS to implement tablets in classroom was to implement this as a supporting system not to replace the traditional teaching methodology. There are a number of benefits of using tablets for e-learning. The expected benefits for which AIS planned to implement tablets in classroom for e-learning are as follows:

5.1   E-Books

Most schools including AIS previously used to sue physical textbooks which are pricey. A number of students cannot afford to buy the original books. Also regular text books are very heavy and carrying a bunch of 8 to 10 books plus copy books in a single bag makes it extremely difficult for the students to carry them to and fro between classrooms, school and their home. If a student writes on physical book for referencing or taking notes, it cannot be removed or modified. To resolve these problems, use of tablets allows students and teachers to use e-books instead of regular books. It makes it really easy for students to carry 10 or maybe hundreds of books with them without worrying about the heavy weight of the books in their tablets or USB flash drives while in the classroom.

5.2   Environment Friendly

Physical books as well as the classroom worksheets that teacher distribute for several activities make use of papers. A lot of paper is wasted which is harming our eco-environment. Also due to the concerns about greener environment, there has been a great deal of implementation of green computing among educators. Therefore implementing tablets helps in maintaining a greener environment with the use of e-books and e-documents containing exercises and worksheets and students would be able to solve the sheets and email or send the solved files back to their teachers saving a lot of time and paper which makes the use of tablets environment friendly.

5.3   Efficient and Time Saving

Using tablets in classroom is more efficient. Teachers can pre-assign the work to students through email or school web portal before even getting into class or a day before. Students can view the assignments and class schedule in advance in order to prepare and complete the assigned work before hand making it more efficient and time saving approach rather than the traditional approach in which teacher used to assign work to the students during the class time.

5.4   Interactive Classroom Activities

Teacher can use tablets for one to one interactive activities with the students by having a quick survey, quiz or web-based science and mathematical simulations making this a good choice to deliver the knowledge in a way that is more enjoying and easy to understand for the students.

5.5   Presentations

While delivering presentations, teachers can provide students the required information electronically. Students can then take notes in the form of interactive annotations and side notes to better understand the topic and review them later.

5.6   Online and Web-Based Quizzes

With the implementation of tablets in classroom, students can give online and web-based quizzes. AIS have developed a web based system before for teachers to create online quizzes and student previously used to give the quizzes in computer labs. This approach used a lot of time since not all the students of all grades can be accommodate in the computer labs at the same time. And the movement of students to and fro from classrooms and labs uses extra time which can now be saved after the implementation of tablets as it will provide the opportunity to the students to give online quizzes from staying within their classrooms on their own individual tablets PCs saving precious time.

VI.   CONCLUSION

It has always been evident that implementing a technology based solution anywhere in the world, raises some challenges and issues that needs to be addressed for that technology based project to be successful. Many of the discussed challenges and issues may be applicable to other parts of the world as well but mainly they were specific to the scenario of schools in UAE. The same with the benefits, as there can be many more benefits for using tablets in classroom for e-learning, but the benefits that were expected and required by AIS were being mentioned in this paper. Further study of K-12 educational institutes and schools in other parts of the world can be done in order to do a comparative study of the differences of the needs and challenges of implementing tablets in classroom could be identified.

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