

Tablets (iPad) for M-Learning in the Context of Social Constructivism to Institute an Effective Learning Environment

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Abstract: With the proliferation of mobile devices, educational institutions have experimented with it to implement mobile learning (M-Learning). Studies have revealed that effective learning happens when teachers and learners are actively participating in the knowledge building process. Therefore, there is need for mobile applications that create effective learning environments which are learner-centred, knowledge-centred, assessment-centred and community-centred. Mobile applications used by educational institutes have been categorised and mapped to respective learning theories that it supports. From these it can be observed that none of the existing applications demonstrate social constructive perspective of learning theory.

1 INTRODUCTION

With the proliferation of mobile devices, educational institutions have experimented with various mobile devices to implement mobile learning (M-Learning). Mobile devices have been used to facilitate, support, and enhance and extend the reach of teaching and learning. But, use of mobile devices has not moved further than when it was first adopted. It is still used to provide and access mere information, rather than construct knowledge.

As M-Learning has been conceptualised with the assumption that learners are always on the move, M-Learning has been viewed as an isolated activity. To be able to view M-Learning as a rich, collaborative and conversational experience, we need good mobile applications. Mobile applications would act as a platform on which an effective learning environment can be created.

Tablets (iPad, Samsung Galaxy, etc.) have become pervasive technology because it is now widely embraced by students, teachers and even formally adopted by educational institutes. Its popularity can be credited to the availability of significant number of educational applications ranging from study aids to collaborative and interactive learning. Currently available educational applications have been categorised and mapped to learning theories that each app supports. Most of

these applications support traditional learning activities instead of enhancing them.

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2 M-LEARNING

M-Learning is defined as a form of learning accomplished with the use of mobile technology. Recently tablets have been added to the growing list of mobile devices used for teaching and learning purposes.

Educational Institutions have used mobile devices to demonstrate technological feasibility and pedagogical opportunity (Taylor and Evans, 2005). The US National Research Council produced a synthesis of research into educational effectiveness and they concluded that students learn effectively when the learning environment is learner-centred, knowledge-centred, assessment-centred and community-centred (National Research Council, 1999). These research findings match the social-constructivist approach of learning where students play an active role in a learning context and teachers and students collaborate to facilitate knowledge construction.

Therefore, as reported in EDUCAUSE report 2011, use of mobile devices are expected to change the didactic traditional classroom learning to a more active and engaging learning environment which also exploits the social-constructivist pedagogical approaches to learning.

2.1 Mobile Use in Higher Education

Zeng and Luyegu (2004) reported that the use of mobile technology resulted in escalated transformations, while in 2010 some researchers were still predicting that mobile technology could play an important role in the revolution of education (Liu and Hwang, 2010). This indicates that their use in education have not been evaluated and reported.

Mobile devices are largely being used for delivering information and barely being used to actively engage students in the learning process (Litchfield, Dyson, Lawrence, and Zmijewska, 2007, Rudd, 2011).

Mobile phones with their restricted screen size have limited their use to sending SMS (Short Messaging Service) messages, with prompts for course requirements, assignment due dates, polling answers for quizzes, and sending URL links to additional learning resources.

Tablet PCs have been used as an interactive digital whiteboard (Anderson et al. 2004; Willis and Miertschin 2004). They have also been used for note-taking, reading, and for in-class assessments, with the use of systems such as Lecturer's Assistant, and Class Presenter System.

3 TABLETS FOR EDUCATION

Tablets such as iPads have been designed and developed primarily as an interactive content consumption device with intuitive interface. Though the iPad was never specifically developed as an educational tool, educational institutions have widely started adopting iPads. Its advanced attributes allow the user to experience just-in-time learning opportunities, connection and convergence to other devices, networks and technologies. Thereby, users are not restricted to traditional limitations of time and space related to learning.

3.1 iPad for Teaching and Learning

Many universities worldwide have discussed and reported on the general uses of the iPad but none of the universities have determined a significant

pedagogical use of the device in higher education. Additionally, the universities have not yet formally measured and reported the impact of the iPad.

Universities have adopted the iPad as a collaborative tool, a standardized mobile device to integrate into curriculum. Stanford University of Medical Science, Seton Hill University, University of Adelaide and several other universities around the world have started iPad projects. The core goals of these projects were to improve the student learning experience and also to replace traditional textbooks and other teaching materials with online study tools.

3.2 Impact of iPad in Education

The iPads have been effectively used as a content delivery device, complementing other forms of conventional content delivery methods. The University of Minnesota, Stanford University, and the University of California-Irvine are some of the medical schools that have handed iPads equipped with productivity, content delivery, and content consumption apps to students.

Therefore, reports released on these projects have limited its focus primarily on the use of the iPad as an eReader. Furthermore, Stanford University reported that its use did not significantly contribute to increased student learning outcomes. But these universities have left it to the students to explore the use of the iPad for learning, instead of integrating the device in the design of their teaching and learning activities.

4 TAXONOMY OF EDUCATIONAL APPS

Students and teachers have used numerous educational apps that are available on the Apple appstore (www.apple.com/au/ipad/from-the-app-store/) and some of the universities have even developed their own apps. The following taxonomy of educational applications has been developed to classify apps used for formal learning. In this context, formal learning is defined as learning where a university/department sets the goals and objectives of learning (Cofer, 2000).

These categories have been chosen after analyzing applications that are (or have been) used by the students and teachers in higher education. Each category is further described below.

- i. Content Consumption and Creation Applications

- ii. Content Delivery Applications
- iii. Collaborative and Interactive Learning Applications
- iv. Course Management Applications
- v. Teaching and Learning Enhancement Applications

4.1 Content Consumption and Creation Applications

Students and teachers use these applications to read, take notes, concept map their ideas, create presentations, draw diagrams, and make use of spreadsheets to capture and analyse tabular data sets.

4.2 Content Delivery Applications

This category of applications is used to enhance the delivery of lectures and distribute podcasts of the lectures and discussions. These applications are used to make the lectures dynamic by using them as interactive digital whiteboard.

4.3 Collaborative and Interactive Learning Applications

Lecturers use this category of applications to encourage students to engage, participate, and provide them with platforms to collaborate and learn. It includes applications that encourage any kind of communication among teachers and students, including classroom polling applications, as they help in initiating classroom discussion.

4.4 Course Management Applications

Applications that universities use for administration purposes such as unit enrolment, class allocations, unit tracking, grade management, and to manage lecture and course content. Some of the universities have developed custom course management applications, while most universities use Blackboard Mobile™ application.

4.5 Teaching and Learning Enhancement Applications

These applications are used by teachers and students to support teaching and learning activities. . These applications also include file management applications that help people organise their files as the iPad does not have a file management system.

5 MOBILE APPLICATIONS AND LEARNING THEORIES

In the following table, the above categories are compared with the classification of mobile learning activities developed by Naismith et al. (2004). These authors have categorized activities around existing relevant learning theories.

Table 1: Application taxonomy with relevant learning theories.

Mobile Application Category	Example Mobile Applications	Learning Theory
Content Consumption and Creation	Consumption: Inking, GoodReader, Creation: EverNote, AutoCAD WS	Some apps have quizzes which partially support Behaviorist learning theory
Content Delivery	KeyNote, Podcasts,	Constructivist learning theory
Collaborative and Interactive Learning	Edmodo, iClicker, iResponse Convore, tweet	Behaviorist learning theory Collaborative Learning
Course Management	Blackboard Mobile™ and university applications	Not Applicable
Teaching and Learning Enhancement	Splashtop, Air Sharing, DropBox	Not Applicable

The iPad projects have reported that its use did alter academic workflows, such as making them paperless, web resources were easily accessible, easier note handling, marking made portable, and listen to podcasts anytime (Marmarelli, 2011, Hardy and Suter, 2011, Murray and Olcese, 2011).

Available educational applications demonstrate that the iPads have just been used to replace traditional modes of teaching and learning. They have indeed made learning and teaching efficient, but there are no formal reports on being able to create effective learning environments.

Therefore, universities need to develop applications that help create learning environment that supports the social-constructivist approach to learning, where students play an active role in their learning, and teachers and students collaborate to facilitate knowledge construction.

6 CONCLUSIONS

Educational institutions have experimented with almost every available mobile device, to enhance and to make learning more effective. The tablet is the latest technology that universities have started adopting. The availability of numerous educational applications for the tablet gives it an edge over all the other mobile devices.

From the taxonomy presented above, it can be seen that all of these educational applications demonstrate behaviourist, constructivist and collaborative perspectives of the learning theory and none of them demonstrate the social constructivist perspective of learning theory

There are very few applications that provide interactive and collaborative pedagogy. To make tablet an effective educational, there is need for educational applications that can capitalize on the benefits of effective learning pedagogies.

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