

Future Technological Approaches to Distance Learning

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1. Abstract

Popularity of distance learning programs has increased in the recent years, with more students opting to study from the comfort of their home or workplace. The early implementation of distance learning programs involved the distribution of study materials to remote students by using of snail mails and organizing optional class room and test sessions at preferable locations. However, with advent of the Internet era, student could leverage the real benefits of distance learning.

The educational system is experiencing a new transition with the penetration of mobile devices such as PDA's, mobile phones, pagers and laptops. These devices provide a mobilized study environment and have lead to the development of a new field of research, known as m-learning. M-Learning is the study which explores the ways in which mobile devices can be integrated and used in an existing eLearning scenario. Numerous universities are working towards the goals of m-learning. Apple's new generation digital music player, the iPod, is the latest addition to the distance learning toolkit. This paper presents an overview of the current technological used in promoting m-learning, without delving into intricacies of individual projects. The paper also highlights the use of iPod's in distance learning and evaluates its strengths and limitations as an educational tool.

2. Introduction

Universities over the past few years have either used the Internet to enhance the classroom learning by providing online access to lecture notes, assignments and additional course related resources or used it as the medium of implementing virtual classroom. With the virtual classroom it is now possible for the students to participate and attend classroom lecture from a remote location. In addition to the distance learning programs provided by the traditional brick and mortar universities, we have virtual universities. These virtual universities exist only over the web and allow students to enroll in online degree programs. Some of these programs allow students to adjust the pace of their courses depending on their comfort and time constraints.

Popularity of such distance learning programs highlights the importance of flexibility in the education system. Mobile devices and their use in education have extended the idea of flexibility to new frontiers. M-learning is the concept of incorporating these devices into the existing web based educational framework.

The major incentive of using mobile devices for educational purposes is their extensive penetration of these devices. Moreover, the advancements in features of these devices such as multimedia support, access to the Internet, increase of storage capacity, Bluetooth compatibility and better resolution have enabled them to be used as an information dissemination and learning tool. However, mobile devices have certain limitations such as low screen resolutions, concise keyboards, limiting processing capability that come in the way of their widespread acceptance.

Another technology which is gaining much attention is the use of Apple's iPod and podcasting in education. Podcasting is the method of distributing music files and videos over the Internet using RSS feeds. Podcasting originated with the increase in popularity of ipods and was primarily used for downloading of music using iTunes or similar applications. This concept of podcasting is gaining impetus in education and is being used in distribution of lectures and other study materials.

3. Existing Scenario

The use of mobile device in education is a relatively new concept. Literatures [1], [2], [3], [4], [5], [6] discuss the efforts taken by various academic and non-academic organizations to incorporate mobile learning tools in the existing educational framework. Some of the uses of these devices are accessing lectures notes over the mobile equipment, taking tutorial and quizzes, participating in group discussions, information sharing among students and, replying to discussion threads. In addition, mobile devices are successfully being used for enhancing individual's learning experiences by quick access to reference books and dictionaries, language translations and note taking.

The two features that make mobile devices an ultimate success among students are mobility and flexibility. The study of students' perspective on the use of mobile device as a learning tool indicated that 48% student prefer the use of mobile device over other tools and out of this percentage, 70% students consider that mobile devices are easier to use and scale better for students do not have prior knowledge of using personal computer[7].

However, certain challenges need to be address before mobile devices can be widely used in distance learning. These devices have lower screen resolution as compared to personal computers, which makes reading text difficult over the small screen. The limited processing and storage capabilities also act as limiting factor in large-scale deployment of these devices for the educational purposed. Moreover, the current market is teeming with a large variety of mobile equipments with varying configurations and features. Due to this diversity, deployment of applications over mobile devices becomes difficult.

To make m-learning popular, there is a need to develop an architecture that can address two main concerns – namely, integration of mobile devices with already existing educational tools and having mechanisms which can bypass the limitations of size, capability and bandwidth associated with mobile devices. Many solutions have been

proposed for integration of mobile devices to the already established educational framework. One such proposed architecture is mobile Learning Management System (mLMS)[8]. The mLMS involves implementation of components that enable mobile devices to function over the traditional eLearning system. This architecture uses modules, which determine the factors affecting the learning system and depending on this knowledge provide mechanisms to present contents over the mobile devices and deal occasional loss in connectivity of the users.

To address the second issue of limited bandwidth, capability and size, the proposed solution is the use of context and location aware system that can provide content based on user's current needs and preference. This approach not only deals with the limited architectural features of mobile devices but also enhances the experience of the students by providing them with relevant information. For instance, providing a student with details of a chemical reaction, as they perform their laboratory work, is a value addition to learning process. The researchers at European m-learning project, the MOBILEan, [9] proposed the architecture of a context awareness subsystem (CAS), which can be used to provide contents to the learners based on their current knowledge about the displayed topic, responses to questions and their learning styles.

Security of mobile devices is another concern. In distance learning programs easy accessibility along with high security is desired. Mobile technology provides an extremely flexible learning environment but recent worms and Trojans attacks against mobile devices have raised alarms. As m-learning gains momentum, security of these systems needs to be addressed.

4. iPods as educational tool

As research for finding ways to support learning through mobile devices continues, new alternatives are being experimented. The latest breakthrough is the use of Apple's iPod in education. Ever since its release in 2001, iPod has been very popular as a digital music player. In an attempt to support distance learning through ipods, Apple recently launched a variant of iTunes's – the iTunes U. iTunes U provides universities with free hosting capability for the lecture prodcasts. Students can then subscribe to iTunes U and remotely download these lectures, which later, can either be synchronized to an iPod or burned to a CD. The advantage of using iTunes U is that it is based on the concept of RSS feeds, which enables automatic download of any update to the lecture content after it is posted on iTunes U [10]

Many universities across United States of America –Duke University [11], Brown University [13], Stanford University [12], the University of Michigan [14], the University of Wisconsin-Madison [15] and the University Of Missouri School Of Journalism [16], Georgia College and State University [17] – are using making efforts to provide the students with ipods and podcasted lectures. With the new generation video iPods it is possible to provide both video and audio contents to these mobilized students. Students can download these lectures to their iPods or even listen to them using traditional media players on personal computers and laptops.

Use of iPods provides a highly adaptive learning process. Students can download and re-visit the lectures later, or learn new concepts on convenient times such as while waiting for bus or in car or while walking down the street. Unlike PDA's and mobile

phones, iPods were initially designed as music players, so they do not support feature of text entry through keyboard. Hence, learning through iPods, is based on listening and seeing. iPods have been successfully used in teaching foreign languages and music, history, social sciences along with acting as teaching aid in medicines, science, and mathematics .

5. Conclusion

The rise in the use of mobile devices among students has motivated the universities and colleges all over the world to consider the use of mobile devices as educational tool. The growing popularity of m-Learning, has proved that mobile devices are more than just communication equipments. With appropriate integration with the eLearning system, mobile devices can be a powerful and economical solution. Distance learning programs aim to provide a flexible and an adaptive learning environment and mobile devices extend these features.

M-learning will evolve with improvements in the mobile technology and equipments. However, for widespread acceptance of this technology in distance learning there is a need of development of a robust architecture which is supported over mobile devices of varying capabilities and features. In addition, this architecture should be able to deliver context sensitive and timely information to and from the mobile devices.

The increasing success of ipods in education indicates the growing demand of simplicity along with a flexibility learning environment. Use of iPods in distance leaning will particularly be helpful for adult education, where ease of use is a desirable feature. Podcast are easy to develop and with iTunes U distribution of these podcasts is cost effective. Moreover, iPods do not have a persistent connect directly to the Internet, which is both - a desirable feature and a limitation. As iPods do not have an “always on” connection to the Internet, it minimizes the threat of direct worms and virus attacks. However, this lack of connectivity to the Internet limits the usage of iPods as compared to PDA’s and mobile phone.

The growing popularity of iPod and iTunes has added an additional channel to m-Learning and distance education. Distance learning programs will gain more acceptances with the incorporation of similar mobile technologies.

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