Evolution of Distance Education from Asynchronous Model to Adaptive Mobile Model

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Abstract

Evolving of information and communication based distance education system is began with learning management system (LMS). This type of distance education can be called as asynchronous model. Then, web conferencing software is added to the LMS, so synchronous model is obtained. After that, distance education is evolving from static to adaptive system. This adaptive system should be taken into account according to the students’ needs, preference, abilities and background. This can be accomplished with students’ profile and data. As in all fields, there is a transition to mobile environment. Distance education transforms from traditional to intelligent based mobile structure. In this model, students can access distance education facilities at any time, any place, and any way. The intelligent in other words adaptive mobile education model is able to support and meet the different individuals’ needs. It provides effective learning environment with variety of services. With this way, performance and effectiveness of educational process can be developed. The overall purpose of adaptive mobile education is to provide better understanding and improve learning capacity. These can be accomplished by adaptive learning content creation, adaptive evaluation of students’ success rate and knowledge, and adaptive integration of synchronous distance education system. It also provides personalization for students and facilitates the effective use of mobile education. In these processes, artificial neural network, fuzzy logic, support vector machine algorithms and statistical methods are used. Evaluation of innovative studies related this issue will provide roadmap for researchers. In this study, it is deal with the evolution of distance education from asynchronous model to adaptive mobile model and prominent studies in literature related to the mobile education are summarized. In addition, current status, advantages and disadvantages of mobile education are also evaluated. At the end of the study, it is given some suggestions about future adaptive mobile model.

Keywords: Distance education, adaptive, mobile;

1. Introduction

Distance education is a term that contains all features of traditional education, information and communication technology. It is proven that it improve the performance of learning, increase the accession of knowledge. For instance, U.S. department of education reveal that participants in distance education generally performed better than those in traditional courses (Means 2009). There are lots of free online course program
such as MIT Open Courseware program. These programs allow participants to attend courses across social or economic boundaries (Internet 2013). In addition, distance education provides ease of use and flexibility to students; develop the ability that is required in their profession and career (Kerkman 2004). It also offers cost-effective education for large number of students. By offering the place independence, high skilled academic staff can teach students who lived in rural areas. It enhances collaboration between students. Distance education is also used for rehabilitation purposes for persons with disability (Savickaite 2012). In Karal and colleague’s study, it is found that distance education assists handicapped person feeling more secure and relaxed (Karal, 2011).

Depending on the use of technologies in education, students’ behavior and expectations are changing (Oloruntoba 2006). In this context, mobile education provides new way of education. It is defined as presenting of new educational content to students by using mobile devices (Parsons 2006). Today, mobile technologies are used as multimedia-supported learning environments. Students have positive point of view about the communication and interaction features of mobile device (Erişti 2011).

This paper is organized as follows; firstly, status and forecasting about distance education is presented. Secondly, asynchronous and synchronous distance education is explained in detail. Then, innovative papers regarding the mobile and adaptive mobile education studies are summarized. Finally, conclusion and future works about mobile distance education are given.

2. Distance Education

The market of distance education is getting bigger. The worldwide distance education market is forecasted to be over thirty-eight (38) billion euros (European Commission 2000). Developments of internet accession speed, opportunity and multimedia products boosted the market (Nagy 2005). It is forecasted that distance education will intensity to be used for disabled person education and low income people in order to remove the differences between the geographical regions. By evolving technologies, different types of distance education ways are presented in recent years. Mobile adaptive education is one of the emerging one of these ways.

Distance education is carried out in all fields of education such as bachelor and post education. Due to the time, permission problem, it is mainly used in post education. For instance, 44 per cent of post- students in the USA are attending some courses online, and estimated that this will increase to 81 per cent by 2014. Due to the reason, it can be forecast that distance education can be the dominant form of post education (Ambient Insight Research 2009).

3. Mobile and Adaptive Mobile Education Studies in Literature

Pieri and colleagues describe mobile education as the offering of learning content to specific groups through portable components such as mobile devices (Pieri 2009). In addition, mobile education is described by Quinn as the intersection of mobile device and distance education: accessible facilities wherever you are, high interaction, effective learning (Quinn 2000). Mobile education enables an opportunity that is capable of
learning every where and every time. It provides interaction, collaboration and customization. Due to the increasing popularity of mobile devices, mobile education is becoming a global reality, even for developing countries (Barker 2005).

In literature, there aren’t many studies regarding the adaptive mobile education. These studies mainly focus on performance evaluation and tutoring system. Important studies related to the mobile education are summarized and presented below;

Gimenez López and colleagues analyze different methods of adapting digital content for its delivery through mobile devices considering functionality of the contents and navigation requirements (Gimenez López 2009). In Liu and colleagues' study, the application of artificial learning intelligence in mobile education is investigated (Liu 2010). Yarandi suggest a new adaptive mobile education model for learning new languages based on the ability of learners. (Yarandi 2012). Esmahi and colleagues define a multiagent system for delivering adaptive m-learning services (Esmahi 2004). In Park and colleagues' study, provides an adaptive platform that determines user’s learning style based on an analysis tool and updates the profile as the learner engages with e-learning content (Park 2008). Eamsinvattana and colleagues explore how Activity Theory can be utilised to develop adaptive mobile learning environments (Eamsinvattana 2008). In Ahmed Al-Hmouz and colleagues' study, an adaptive Neuro-Fuzzy Inference System for presenting adapted course content to mobile participants is introduced (Ahmed Al-Hmouz 2012). Okamoto offer a device-independent architecture for mobile education (Okamoto 2008). Cabada and colleagues introduce an implementation of pattern recognition techniques adaptive learning social network with mobile facilities (Cabada 2011). In Ghadirli and and colleagues’ study, the role of mobile devices and expert systems are investigated and system that integrate these devices and systems is proposed (Ghadirli 2012).

4. Conclusion and Future Works

Distance education faces with enormous opportunities and challenges. For instance, interaction between instructor and students, time and place independence, ease of use can be overcome with mobile education. However, virtual or remote laboratory based distance education is still a problematic issue. There is academic study regarding to the issue such as Radio Frequency (RF) laboratory. However, it is thought that distance education is suitable for non-laboratory based course.

Mobile education is becoming one of the newest types of distance education. In this education, SMS, podcast, time and place independence attract users. Until the emerging of it, place and time independence are not provided. It also simplifies accession of learning content. Mobile education is still in a development stage. It offers effective, flexible and ubiquitous education to assist learning. However, there are a lot of difficulties and needs in this stage. Technical challenges, adaptation of learning content to different mobile devices can be given for these difficulties. Increasing number of mobile application, advances in mobile device, accession of wideband wireless network are estimated to serve these requirements. In addition, adaptive applications enhance the power of distance education. The overall purpose of adaptive mobile education is to
provide better understanding and improve learning capacity. These can be accomplished by adaptive learning content creation, adaptive evaluation of students’ success rate and knowledge, and adaptive integration of synchronous distance education system. It also provides personalization for students and facilitates the effective use of mobile education. In these processes, artificial neural network, fuzzy logic, support vector machine algorithms and statistical methods are used. It can be proposed that artificial neural network is the best choice for adaptive applications with distinguished features. It can learn the issue and classify it with high accuracy.

5. References


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