

Survey Paper (Mobile Learning)

Survey Paper Mobile Learning & Education

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Abstract- The purpose of this survey paper to highlight mobile education and mobile electronic learning using tablet, PDA and Smartphone. The Methodology of the research contains previous research and latest research paper. The investigation of Mobile learning in universities and education institution has been discussed. Mobile learning provides lot of benefits to the student at the moment. Student can easily learn through mobile, Smartphone and PDA using internet connection. The objective of this research paper present analysis of the mobile learning and education.

IndexTerms— Mobile learning, Mobile education, Cloud computing, mobile cloud computing education, teacher perspectives, student perspective.

I. INTRODUCTION

Online education has lot of benefits, student has their submission to retrieve data and upload and download their assignments and paper. Online learning management system mostly provided by the national and international universities, most of the universities provide online education program. Mobile education is that particular education in which student can enhance their skills through online asking question to the teacher and to the colleagues. Mobile computing integrated into e-learning make courses in the universities more accessible and portable. The student can read their lectures and listen video lecture also. With the arrival of mobile learning universities be aware of learning tools e.g. IPOD and Tablet play a major role in learning education through mobile. Most of the organization and learning center deliver information and even lecture online and video conferencing.

The arrival of cell phones, PDA, MP3 players, portable game devices, handhelds, tablets and laptop that these devices connected and communicating to each other in ways that would have been impossible a few year ago. Through mobile computing we can view E-Books of every type and electronic magazines and journal are a part of online learning. Before 8 years mobile apps are not so mature and sufficient to fulfill the desired requirement of the user. E-Learning is taken far away from class room and mobile learning is in class as well as on class room and faraway.

This paper is structured as follows section 2 describes the common mobile computing devices and its usage in the university campus, section 3 shows some details of educational proposition of mobile learning. Section 4 details on the survey done by other researcher. Section 5 present

challenges of mobile learning and education and finally conclude. [1]

II. MOBILE COMPUTING DEVICES & ITS USAGE IN THE UNIVERSITY

PDA

PDA stands for personal digital assistance its work like a cell phone and have large LCD display. Laptop and PDA support mobile learning education. Merit: student can send email to the teacher and view their lectures, Bluetooth, Wi-Fi connected with PDA demerit: the cost of the PDA matter because user increase their call limits and internet connection limit that increases its cost.



Figure 1: PDA

Smart Phone

Smartphone contain internet connection to facilitate student for downloading lectures and tutorials. Smartphone considered as a complete phone and it has a smart battery and strong signaling capacity with internet connection. Merit: user can view and edit their document. Demerit: Smartphone changing the trend of young generation.



Figure 2 : Smartphone

Laptop

Laptop is known as portable computer and its uses like a mobile phone, laptop contain Bluetooth, Wi-Fi, internet connection and smart storage space for storing digital data. The main goal of laptop to create digital document and project using time constraint. Merit: smart working in smart time Demerit: laptop has limited battery.

Tablet PC

Tablet PC works like a mini computer and enrich with mobile features, it has a touch screen and student can integrate his voice and body movement with the intelligent tablet sensing. Merit: Tablet computer low weight easy to carry Demerit: sensitive touch screen. [2]

III. MOBILE LEARNING CLASSIFICATION

Mobile Wireless LAN

Mobile wireless is a WI-FI technology in which student connects with Wi-Fi router to connect with the internet. Most of the student depends on internet bandwidth and its usability. WLAN has of advantage and benefits. Student can easily watch video lectures online and listen audio lecture as well.

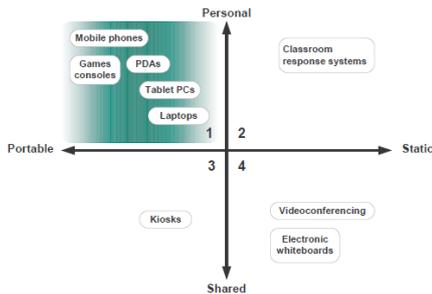


Figure 3: Mobile Learning Apps using in different scenario

Faculty Student Exposure on Mobile Learning

Teacher using internet connection for upload their lectures and class notes on the web. Most of the student carries smart phone and tablet for their personal usage, students have limited time for study, and mobile plays a significant role for developing a study framework. Private sector and public sector universities begin online learning management system on their web site, which is very remarkable effort to enhance the skills and knowledge level of the student.

Bluetooth

Bluetooth is a technology which is used for data transfer from mobile to mobile communication. University student carries cell phone and they have lot of education material, and knowledge is transfer from person to person using Bluetooth technology.

GPRS

Most of the mobile phone companies offer GPRS package for internet connection that is it is very affordable and usable for everyone. GPRS connectivity based on mobile generation 3rd generation and 4th generation mobile network have lot of capabilities to send and receive heavy data. [3]

IV LITERATURE REVIEW

A. Architecture of Mobile Learning

In this paper the author proposed architecture of mobile learning in university environment. The terminal connected with the infrastructure inside the university Local Area Network (LAN) and also connected with the external network environment. The university offer server platform for course management system for educational resources and it is connected on the university LAN. A student might access the platform directly from the university LAN or through the internet in order to collect the learning materials. The student can access the data center of the university from WLAN as well as from Local LAN network.

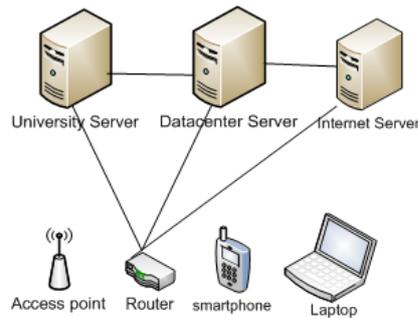


Figure 4: University Mobile Learning Architecture.

The advantage of this architecture that is its offer services to the teacher and student in the university premises. The author suggest electronic learning using mobile devices and mobile device contain lot of online apps and building block apps, student can download easily using internet service e.g. teacher agent and word editor for learning and writing assignment. The university classroom frequently should have the following equipment e.g. PC or laptop, microphone, speakers, tablet, webcam, projector and a monitor or screen. At the university classroom the lecturer and professor will present and deliver the content of the learning material to the students in a classical manner, or via the internet to the student that are at home, at work, or mobile. Mostly the student and the teacher when they are at home they usually use their own personal computer or laptop using high speed internet connection. Student use their mobile devices e.g. smart phone and tablet they usually connect with GPRS, UMTS, LTE for learning. According to this paper the technology development and trend increased speed and density of integrated circuits, enhanced transmission capacities on the optic Fiber network and networking flexibility, distributed and open platform-based communication software capacities.

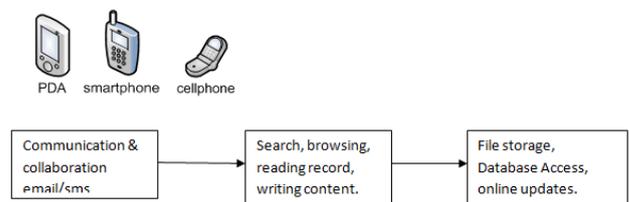


Figure 5: Detailed Architecture of Mobile Learning & Education.

Benefits of Mobile Learning

The university server provides facilities to host the digital educational resources, which can be access by the lecturer and

all students either locally, or throughout the internet connection. Entire student and faculty of the university can access the server platform to collect or download the data from the server using cloud computing environment.

Disadvantages of Mobile Learning

The main drawback of using Smartphone student misuse mobile apps and mobile services e.g. socializing their data and project to the entire student member using internet GRPS. [4]

B. Mobile Learning Using Cloud Environment

According to this research paper the user will access the cloud space using his/her qualifications so that the required data will be shared from the cloud based client request only for the real user.

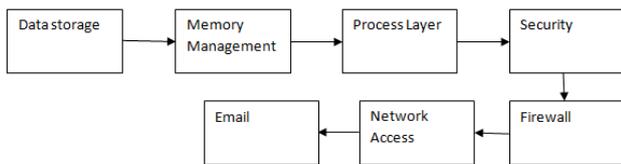


Figure 6: Present data storage and management scenario.

Functionality of Mobile Learning

The student who wants to make user of mobile learning has to register and get recommendation to use it via web service. Student can also be download mobile apps which will be installed in mobile phone through the GPRS and WIFI connectivity. The student can read the documents, look at the video tutorials, listen to lectures or seminars and finally they can take up self assessment. They will be given a results and analysis so that they can evaluate their strengths & weaknesses on their own. The mobile system helps to learn while you roam and also education for all at any time any where globally. Professional can also share their valid tutorials in to the cloud for development of the education community.



Figure 7: Process flow of mobile learning cloud computing.

Mobile Learning Client Model

In client mode user has to download this application and install in their personal digital assistance device and their Smartphone. The student has to connect to the GPRS/Bluetooth/ WI-FI and connect to the cloud network and get the required topics and based on the selected topic materials will be downloaded to the mobile for the reading process.

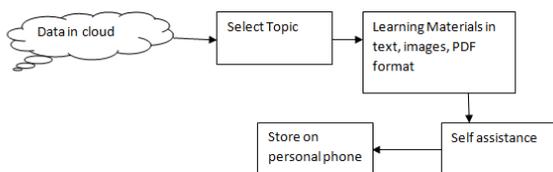


Figure 8: Process Flow of Mobile Learning.

Advantages

Mobile cloud plays an essential role in student life, because the data sharing is very important for the learning system. Most of the cloud services providing security services to secure mobile cloud data within a cloud. Student and teacher data have lot of importance because its usability and needs increased day by day. Today there are lot of direct applications for teaching and learning as opposed to simple platform independent tools and scalable data storage. [2]

C. Higher Education & Mobile Learning

According to Lave & Wenger, (1990). Mobile devices and Smartphone also allowed for interaction with the course content and other classmates in a highly situated and contextualized way. Author suggests that the situated learning takes place in the same situation in which it is applied. Situated learning is serving on the individual’s understanding and the legitimacy of the situation. The learning was situated in the situation of the actual university grounds environment, where the explanation of group of people was being inspect and was individualized the student group. [5]

Variety of way of Learning

According to Joanne Gikas & Michael M Grant .(2013) suggests that the student using mobile computing devices to interact with each and share their knowledge and skills. This included recording of videos or voice note to be uploaded to the course site and then discussed by the entire class. Students were able to communicate and work together about course content by using mobile computing devices to text message and email. Student also sense that they have chance for strengthening of the course material when using their mobile devices. Student also participate online programming competition and online quiz segments. Student also participates on project with the form of group or a team. Student also views their results and statistics on course site and if they found any gap and problem then they improve their skills and knowledge. Student and teacher used their twitter account to share their knowledge and information and also tweet on a specific topic and a research. [5]

Communication

The main advantage of the mobile device that student communicate with fellow classmates and the instructor. “According to Lakeshore university student that they felt that the constant communication made available through the mobile device was key in the success of the instruction and allowed them to be fully productive.” Learning happens casually from small group teamwork while students were gathering information around campus. Student interacted with each other through applications, e.g. Skype, team viewer and Face book. [5]

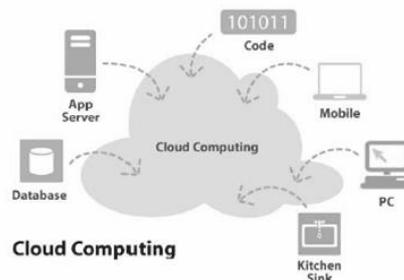


Figure 9: Cloud Computing with various component

Group Meeting

According to Joanne Gikas (2013) “student at the university of Northbrook and Coastal College spoke positively about accessing course content e.g. discussion board of learning management system, course reading, and video clips they needed to watch for class on their mobile device. Furthermore to accessing content they used their devices to upload and post content to their course sites”. [5]

D. Learning Management System

According to Ryann K. Ellis (2009), “LMS (Learning Management System) is software application that automates the administration, tracking and reporting training events. The system is working on multiuser environment where designer can create, store, reuse, manage and deliver digital learning contents from a database”. [6]

In recent times a growing number of institutions and business organization have squeeze the concept of e-learning and m-learning. They use web based learning systems to fulfill their educational needs. The education system with many users has been increased day by day then they required web based learning management system to fulfill their desired requirement and targets.

Mobile Agent

According to Seng Wai Loke (1999) “mobile agents can be regarded as software components which can move from host to host to perform computations. Mobile technology is required to enable efficient data sharing and distance learning with upto date and to allow distributed and mobile workers access information on demand. Mobile agents have been worked within an organization to organized data”. [7] Mobile agents replaced client server model because mobile agent based on internet application e.g. applet.

Synchronization in LMS

According to Joe Sirott Sun et al suggest in their research paper “content synchronization in LMS is new area which involves the transfer of data from one machine to another. Many researchers have conducted their researches concerning synchronization in different applications on data transfer e.g. synchronization of data between accounts, website mirroring, content distribution, storage networks and web search for information”. [8]

E. Advanced Technology in Education

Semantic Web

Semantic web is an internet technology that simplifies the process of most appropriate content delivery to the learner. The most appropriate use of XML (Extensible markup language) Meta data, delivery of learning content that meets needs of learner as characteristic of learning resources contained in meta data files as compared. In this way the learner can receive learning content that will enhance their practical skills and knowledge.

Grid Technologies

Essential reason of Grid technologies to permit handling of vast quantity of information so with addition of Grid in education management of thousands of existing learning resources become an easier task. by mixture of computational ability of grid networks and advantages of semantic web for better description of existing resources searching and delivery of learning content is fast, easy, successful and very useful process. [9]

V. CHALLENGES OF MOBILE LEARNING & EDUCATION

There are lots of challenges in mobile learning, since mobile screen is limited and limited text displayed on mobile screen, mobile communication technology can support the learner to read the content and explore the content in guiding learners to be involved in active learning process without support of rich multiple external representations for providing the complete functions. Cooperative learning above the internet, the factor of response time of the lecturer and the learner, the web learning supports accurately and provides individual learner with higher satisfaction. The main issue location and response time of the learner. Location means where the learner use their computers to access the web learning. [10]

Learner Challenges

Prensky (2001) and several other authors have required to explain the changes in learners in terms of generational differences, measuring such differences by the ease with which they take on and become accustomed to new technologies. [11] Oblinger (2003) “considers the key character of today’s learners as being digitally literate always on mobile experimental and group of people oriented.” A new focus on mobile technology of generation focus on developing capacities in the form of creative, collaborative, critical and communicative responses. [12] According to Thomas (2005) “He described the potential for institution as pervasive learning, where learner and author himself in a location that the learner finds meaningful and relevant”. The development of such pervasive learning models cannot be an end in itself, but is itself a response to learner’s new ways of being. [13]

Technological Challenges

The technological changes in wireless and mobile technology have extensive factor for the learner and the teacher. The literature review considered the following option for mobile learning e.g. Tablet PC and PDA & Smartphone, laptop plays a significant role in mobile learning, but the factor of the price of laptop computer for the learner where they can reach serious group of learner. The extensive availability of the technology is fundamental but itself if is insufficient for the effective learning environments. [14]

Institutional Challenges

According to Rachel Cobcroft (2005) “Universities and other education organization felt that the main factor of responding to external factor e.g. competition, market trends and government policy imperatives and internal factor e.g. student preferences, staff capabilities and educational approaches. The changing cost of the technology purchase and maintenance also mean that the rider of mobile and wireless access compares increasingly favorable with the maintenance of on-

campus computer facilities, even if student are provided with the support financially or free hardware when they first enroll". Bates and Poole (2003) "propose a similar learning model for determining technology choices for effective learning and teaching in higher education; their criteria include appropriateness and access, ease of use and reliability, costs, teaching and learning approaches, interactivity, organizational issues, innovation, and speed. Whatever the list of criteria employed, an examination of whether the right technology has been selected is debatably a key feature of a complete evaluation of mobile learning".

Responding to Organized Challenges

Universities need to manage implementation self-determining of specific models and types to preserve resources and minimize change exhaustion. There is selecting the appropriate technology infrastructure requires an assessment of the appropriateness, quality, compatibility and cost of the devices. The main factor of learning management system, In addition to maintaining device-independent deliver, facade important problem to mobile learning implementation. Teacher will need to establish the background in which the use of mobile technologies is relevant. For example significant social, economic, ethical and educational factors will influence the effective and efficient inform of mobile technologies. [14]

Conclusion

The cloud computing and mobile computing completely change the world, student and faculty data exist in cloud and update day by day. Mobile learning and education rapidly increased in these days. The majority of the universities provides online education program. Mobile learning evolves in the entire educational institutions and training center, and it has lot of business and education application. Student felt that they are very busy in their lives and have no time to stay in front of desktop computer to write assignment and projects, with the increasing usage of Smartphone, tablet, IPAD and PDA and have built in online education apps e.g. online learning management system, mobile agent play a significant role in mobile education. There are lots of challenges existing in mobile education e.g. the future of Smartphone and PDA is exist or not that is challenging question for upcoming generation of 5G and later. The future research direction relating to mobile education contains mobile online apps and their usability in mobile education and what are the role of public sector and private sector universities to promote online education.

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