

# MOBILE AND CLOUD COMPUTING TO ENHANCE E-LEARNING

Syed Mohammad Shoaib  
Asst Prof. Sebghatullah Aslamai

## 1. Abstract

The use of mobile and cloud computing widely used for education in today's era. The e-learning helps to interact with each other without any hardware or software investment. During vacation time in Afghanistan a lack of communication between the students and between the staffs and students the failure on subjects are increasing. Most of the students in university may forgot their major portion and chance for clearing the paper is less compared to other countries. To overcome this most of rules and serious step where taken but lack of computing in cloud and mobile is still a challenging one. Therefore, an Open Source e-learning platform and a user application i.e Android app is developed to help the student to get pass in upcoming exams. Interaction with e-learning platform and an application on their mobile helps them to keep touch in their subjects and helps the students to communicate their educational related queries and get an answer for their doubts.

## 2. Introduction

### 2.1 aim of the research

The main goal of this information communication technology on education will remove the difficulties in pursuing post-secondary education to an individual that helps to develop them in an innovative way, cost-effective manner that delivers rapid education to an individual without an instructor.

### 2.2 research objectives

For the development of global society, higher education, long-distance education and long-term or lifelong human resource provide the development of the society by supporting the society. Information communication technology on education will meet the social demand that helps to the development of the countries, which has limited internet use and educational resources.

The main objective is to provide a learning system to gain skills and knowledge as obtained by an outside trainer or certification center.

The connectivity encourages developing a learning method and assessment materials among different places like a university.

### 2.3 Introduction to cloud computing

Cloud computing helps in e-learning as this will establish and manage the information communication technology resources. According to the National Institute of Standards and Technology (NIST) on cloud computing is defined as, "A model that enables convenient, on-demand access on the network to share a pool of resources that involves minimal provider efforts. The benefits of using cloud computing will provide the low-cost implementation on infrastructure and using this on e-learning will provide a high-quality education.

The availability of cloud computing resources is highly available anywhere anytime, scalability and virtual access on the resource make the user access them. A user does not need any special skill to access this as the cloud service will

organize, manage and maintain the all the resources that are used by the user. A user has to communicate then or access them simply by connecting internet to access remote location servers.

The resources of cloud computing can be externally or internally placed according to the user needs.

### Advantages of cloud computing

- A separate license is not required.
- No installation place and fees.
- Maintenance fees are not required.
- All the works for maintenance will be carried by cloud itself.

They were different cloud computing models and they are

- Public Cloud
- Private Cloud
- Hybrid cloud
- Community cloud

The layers of cloud computing services are as follows,

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)

### 2.4 Mobile computing or Mobile learning

The short form of mobile learning is M-learning which means a mobile device like ipads, smartphones were used for learning purpose. The benefits of mobile phones and the attractive features like easy to carry, optimization and friendly use become popular to distance learning. The use of mobile phones increased nowadays for an effective communication and portable wireless communication helps the user to learn whenever they needed. The user can gain knowledge by accessing a various resource through social media, content in Google. The use of these techniques will help the people who pursuing long-distance education or self-learning.

The availability on one remote server will allow different individuals to access and share the information, this also allows the feedback section that helps to upgrade or discussion that makes them have a clear-cut understanding on their topics.

### Why mobile learning?

This allows taking the next step in the learning as it expands the educational in beyond the level as people do not depend on classroom they can learn anywhere anytime.

Many schools nowadays follows a smart class that helps them to educate the students easily by playing the visualizing concepts.

### Online learning vs mobile learning vs e-learning vs digital learning

All the learning method purpose is to gain knowledge and it is people choice to choose as all of them are interchangeable. The user will choose the learning method which feels convenient to them.

**Online learning:** it is online and offline tools to learn. Google maps and geography concepts where a user uses to learn from online. The online source will help them easy understanding the concepts and depth knowledge about the geography places.

**E-Learning:** this is a platform where you can gain knowledge by self-learning on the internet which contains a series of information available on the internet and data's can be shared anywhere and can access anywhere anytime. But for this internet connection is a must.

### Mobile learning:

This is design as a learning on the go concept as an information is shared among the user or a group of peoples on the same committee to discuss individual concepts and the discussion will give the answer to the question in a clear

understanding way. The portable device is needed as information where stored in the mobile, iPads etc.

### **Digital learning:**

This is the combination of all the above types in learning methods. But in this digital learning, both the online and offline methods are available and the user can choose for their convenience. This is also called Blended learning.

### **3. TECHNOLOGIES FOR E-LEARNING**

The common aim of all these technologies used in e-learning is to gain knowledge to someone. The education system has been improved in India by adopting the technologies on e-learning. Some of the methods used on e-learning are explained below and some combination of this technology.

#### **Audio:**

The audio learning method is that all the materials were stored in an audio file. Audio files are a representation of sounds processed and stored on the computer or in any other digital electronics. A long time audio transmission radio is used on the educational classrooms. In recent technologies, most of the educational institute uses a smart classroom where teachers use to stream the audio from the internet. They will download the audio files for their concept or topics from the internet and play them on smart class.

Webcasts, podcasts on the internet will allow the user to download files for students and teachers.

#### **Video:**

The video is an electronic medium that contains moving visual images. These were copied, stored and telecast on the screen. This helps to learn by visual students and most of the peoples will learn easily by the moving images. Instead of using DVD's and tapes anyone can download a video clip from the internet. Most of the peoples use YouTube to learn the topics along with examples. They can interact by

using webcams, skypes and many videos calling application to share the queries on various topics and can get a clear cut understanding from various different experts.

Video method becomes popular as it is widely used by all the peoples for their distance learning, self-learning and conveying the message to their students.

Computer device: Tablets, PC's, laptops and mobile device were mostly used by all the peoples and this is used externally. This allows the user to share their knowledge by accessing different sites, blogs and portals. Some papers like a word document, text document, ppt, powerpoint, excel, pdf files, images anything can be stored and access anywhere for easy understanding. Where thing on the above will helps for easy understanding as PowerPoint will allow for an easy explanation of the topics instead of a huge number of papers. Excel will allow for easy calculation. And graphs on the excel and PowerPoint will allow easy understanding.

#### **Blogs**

Different blogs on the various topic from various different authors and it is also called a weblog. This allows the user to have a discussion platform that is published on the www (World wide web). The post on the blog was in chronological order. The blogs can be on different topics and can be maintained by either a single user or multiple users. This allows the user to have an interactive section and allow the user to have all their visitor comments and can message them for your queries. By blog one can discuss topics, and post their queries. But this allows having social relations with the visitors and blog writers. Not just educational contents posted here a blog writer can post their ideas, or can post their creative ideas. By this, anyone can learn not just the educational content of some other creative things like painting, music, cooking, dress stitching etc.

## Webcams

This allows the learner to have a face to face learning between learner and teacher. Through the webcams and the internet, one can learn from anywhere to anywhere from different places and from different experts.

## Screencasting

It is a digital recording of computer screen output, and this is also called video screen capture. Through online one can share their thoughts and allows the user to have easy communication.

## Advantages

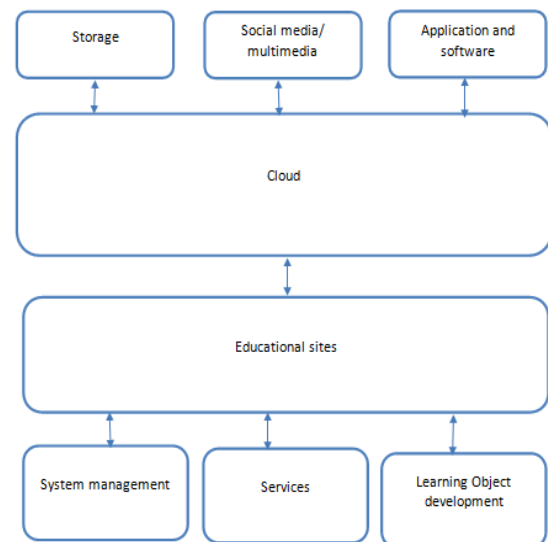
- These technologies become learning easier and comfortable
- Makes the students have more technical knowledge
- Convenient for higher education
- This can save time and travel from different places
- For this age is not a restrictions anyone can learn anything

### Disadvantage:

- It becomes obsolete as this technology were in short period. This allows the learner to upgrade the equipment's and they should have up to date information.
- Most of the components were expensive
- They have to spend too much of time in learning and they should know how to access the technology

## 4. SYSTEM ARCHITECTURE

### 4.1 Mobile and cloud-based e-learning architecture



**Figure 1. System architecture**

Mobile learning or E-learning is an internet-based method used for the learning process. This can be possible by designing, implementing, managing and extend support learning on internet technology that will change the traditional learning method. Doing this anyone can learn themselves anywhere at any time. The advantage and benefits of the e-learning will give the way to use the portable device and it gives the flexibility, diversity, measurements, etc.

Mobile learning and e-learning do not need a teacher to teach the topics, this technology and concepts will allow the new method of education, teachers will help the students to learn by uploading the educational or concept files on the web portal. The function of the e-learning is when an expert uploads the topics in any form like text, audio, video etc. these files were uploaded to the cloud. Cloud administrator will process the file by storing, updating and stored on the cloud database. Whenever the client or student wants to access the file they can access anywhere at any time in any device as all the files that stored on the cloud will be in platform independent. As all

the computing recourses on the cloud are virtualized. The entire layer in the cloud-based mobile learning will be associated with the cloud. Different layers are infrastructure layer, resource layer, management layer, service layer and application layer.

Infrastructure layer has all the information that helps to access the resource like the internet, software, hardware and a physical device.

Resource layer has the main software like operating system, middleware, database etc. this will integrate and act as a link to the software and user.

Management layer where a coupling of both hardware and software resource. For free flow access on the materials or resources, this layer will act as an integration between virtualization and cloud computing.

Service layer, all the three service layer on the cloud where available on the cloud so that user can access and the customer can bring to use learning on the internet. Cloud allows to purchase what a customer wants and they can pay according to the use of them.

The application layer is where a specified application is integrated on the cloud that allows to access the coursework, and share the files and materials.

#### 4.2 Integration of cloud computing in mobile learning

The mobile device does not need an additional powerful configuration like computer configuration such as processing speed, memory capacity, RAM memory etc. All these things where maintained and carried by cloud, then the cloud will process all the configuration that needed in mobile-cloud computing.

**Minimum cost:** all the application that runs on the cloud and thus does not need any memory or a

software in the portable device. This will reduce the additional cost that was needed for memory or another configuration.

**Enhanced performance:** All the process for mobile computing will be performed cloud so the processing time is reduced thus increasing the performance. This will make the mobile device to run faster.

**No software cost:** All the application and software were run on the cloud so installation on the mobile device is not required. On the cloud, every application and software will automatically update so there is no additional payment for updating cost.

**Access Anywhere:** All the files were stored on the server that is available anywhere at any time.

**In dependability:** All can access the files and documents on the server and the files were platform independent. So there does not need additional hardware or software to install.

## 5. RESULTS AND DISCUSSION

At present most of the schools and university asks the students to do more assignments that are creative. This can be done only with the help of the World Wide Web. It gives the content to the students by combining the methodologies like audio, video text with interaction. It can be accessed anywhere and using any platform. It reduces the involvement of teachers, tutors to enhance the self-study using e-learning. The use of e-learning is increased up to 10% since last year. Mobile learning access is increased by 15- 20% per month. The mobile internet is grown up to 8% of PC usages. Since social media users are increased, the usages of the internet have been increasing day-by-day and so mobile users are increased. In Afghanistan, the students have faced a lack of communication during the vacation time. If the university creates a mobile

application and uploads all the syllabus with proper audio, video or text material in the application it will be easy for the students to grow through the syllabus in case of absence to the particular topic. So that the students might not feel that they are left with unknown topics. Few years before students will not have mobile during schooling and colleges. Now the students have advanced smartphones which have GPS, e-book readers, location tracking, browsers, can install any applications and access anywhere since the data is stored in the cloud. So, mobile devices are considered as a major part of the mobile learning. By using the advanced technologies in mobile and cloud computing, mobile e-learning can be enhanced to avoid lack of communication for students and staff thereby it reduces the number of failures in subjects by providing different materials for a syllabus.

## 6. LIMITATIONS

**Cost:** Less functionality on the mobile device will not be good for accessing mobile learning so it is recommended to have a high level of functionality mobiles.

**Mobile Size:** The size of the mobile screen is small so the user should strain their eyes to have a clear focus.

**Storage:** Memory on a mobile device is minimum to store huge files to store offline files.

**Unexpected disturbance:** Disturbance like receiving message, notification or call while accessing on the internet.

**Battery life:** accessing online frequently will reduce or minimize the battery life.

**Connectivity:** there can be a connectivity problem whenever the user has a tower problem.

## 7. CONCLUSION

The recently emerged cloud computing techniques with e-learning and mobile learning will help to have a learning service on the internet. The use

of cloud computing is rapidly changing the technology over the information will turning the long-held utility. The main concepts in cloud computing are sharing and accessing information on a single server and anyone can access anywhere at any time. The cloud computing based service allows to learn from anywhere, anytime and from any device. Through is most experts from different places can give a suggestion for a single question. This helps to have worldwide access at low cost to deliver an educational service to all. This will change the impact of the educational sectors on the global information society.

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