# Security Issues and Threats in Educational Clouds of E-Learning: A review on Security Measures

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## Abstract

*E-Learning with the techniques of Cloud system is the most upcoming technology in IT field and many e-learning products can be established with the aid of cloud computing technology. Cloud computing environment gives very comfort and flexible functions invented in e-learning product , security is a major issue to be analyzed in e-learning at cloud based technology. So security issues and measures are the compulsory and essential to maintain secrecy of the users' valuable data base stored in cloud servers. The analysis in the paper focus different issues of security aspects in E-learning process in cloud environment with a special emphasis on counter measures at certain standards and management of confidential data.These are very useful in avoiding the security threats e-learning technology. To arrive at the main objective of the study, some of the theoretical and empirical studies have been attempted. Empirical involves the data collected from various cloud based resources and websites. The analysis from the study suggests the various issues in security measures to be focused in keeping data confidentially from vulnerable attacks.*

**Keywords: Cloud computing, E-learning, security issues.**

## 1. Introduction

There are many advantages with replacement of traditional E-Learning method by cloud computing technology. Cloud based e-learning solutions play a vital role in reducing the cost of the traditional e - learning technology by its widespread cloud source. But still, there seems to be some problems that need to be concerned at the implementation of cloud based E-Learning solutions in all academic organizations. Many cloud computing companies come forward provide services to many technical solutions to make their products more cost effective. The E - learning is one of such technologies with an implementation of the cloud power to enhance the functionality for providing to e-learners. E-learning is one of the widespread technologies, which helps to share the knowledge among teachers and universities in academic sphere. At the time of cloud services, it is very essential to consider security issues. So in this paper, the key security issues in the utility of cloud computing in e-learning processes have been studied. Security is a just most important all stages of cloud service. Security issue needs to be more focused when system involves the gadgets or technologies with internet [4]. The present work is approached with modern techniques for enabling the cloud service in E-learning process at more advances facilities for the customers as compared to normal existing system. Cloud computing is one of the emerging technology which gives more benefits in the bussines domain and other applications [7]. Still the cloud environment is of no perfect security in its functional platform. The present study will focus on the security in E-learning with cloud implementation [5].

### 1.1 Individual learning environment

Individual learning environment (ILE) is simply mechanism of the E-Learning systems through computer applications with web sources. Individual learning technique is a great innovative application with a modern mechanism with cloud network[ 9]. The task of INDIVIDUAL LEARNING is to provide virtual class room environment huge number of students in worldwide. The terms similar to Individual learning environment are learning management system (LMS), Content management system (CMS), Learning content Managed learning environment (MLE). Individual learning environment basically depends on the on the internet and it provides the learning tools to e-learners for uploading files, chatting, and web conferencing. This learning process gives the advanced and provisions at precise level

- A general display for update information of the course work.
- Courses are available at any time and any convenient place to students.

- Certain needs and restrictions are framed in this kind of e-learning systems.
- The system of cloud in education domain gives a support the people in areas at geographically wider separation.
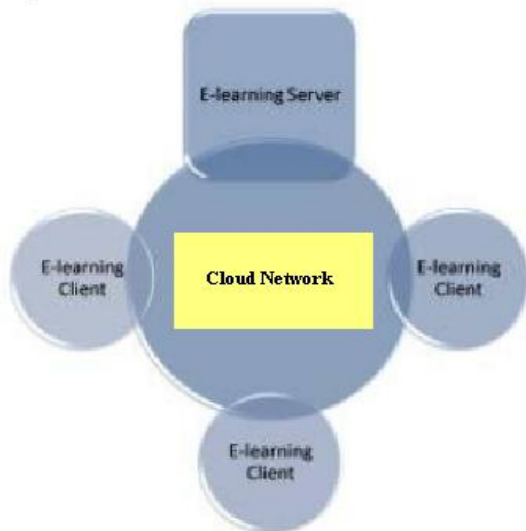- Education with cost effective and flexible is possible.



Figure 1. Basic outline of cloud for e-learning

The figure 1 reveals basic connectivity of the blocks required for the process of e-learning with the cloud technique.

## 1.2 Individual Learning Environment

ILE is mainly uses the integrityof the WEB 2.0 technologies like Wikis, blogs, online feeds, online social interactive felicity with the customers of E-Learning. PLE provides extra features to the users, some of the important provisions are:

- Users can setup on their goal the e-learning system.
- Users can manage the E-Learning systems in both the learning materials and processes in the system.
- The customers will take transaction in e-learning process with the same given instructions.

One node in a web content can be connected to other nodes and content creation in services can be done by other students. Personal learning centers are flexible systems where the content can be reused and remixed in accordance with the student's needs and interests [1-3].
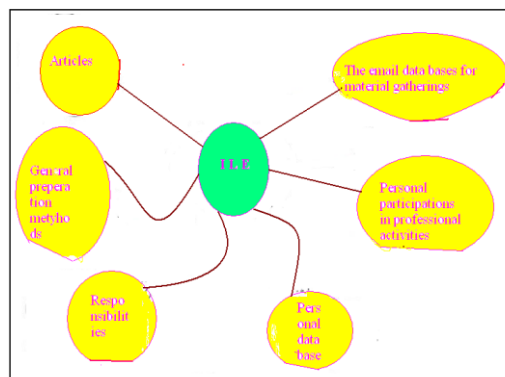


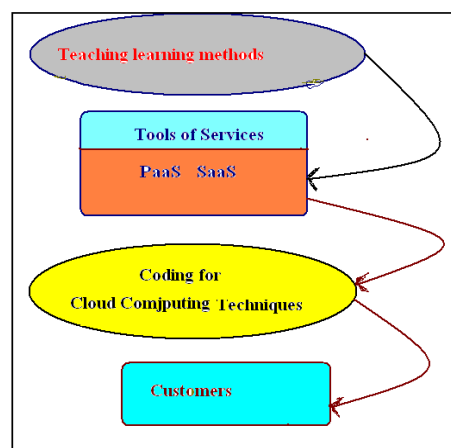Figure 2  Individual Learning outline configuration



Figure 3 Layers of Learning Environment

Resources at hardware are assigned a categorization in terms of architectural components. There are two layers play an significant role in functioning of business application and server load management The interlink communication between hardware and software logic instructions is of vital importance [10]. The details of the layers in layer brief are given here

- **Hardware configuration frame:** This is bottom most layer which is the middleware in the cloud service that handles the essential computing things such as physical memory and CPU for the entire system. This layer is of importance for the complete infrastructure of the system. With the concept of virtualization, physical servers, network and storage are integrated which can be called as upper software platform. In order to offer the uninterruptible power to the cloud middleware services for the cloud based e-learning systems, physical host pool needs to be expanded dynamically for an extra memory.

- **Frame of Software resource:** This layer can be created with the help of operating systems and middleware. With the help of middleware technology, many software solutions integrate to setup the interface for the software innovations. So, software developments lead to many advances features with cloud functions in the domain of various applications.

## 2.Issues in Security challenges at Cloud environment

All printed Security aspects are to be considered in ensuring confidentiality of the proposed system in the cloud users to handle it for its dependency on the web sources in the operation, there are plenty of threats to attack in cloud based e-learning technology through the internet. Even though cloud provides numerous advantages to e-learners, the cloud security remains still doubtful for its security issues and challenges in a digital world. Many multinational organizations now come forward in cloud services. All these companies are of good name in giving reliable services to users, but still peoples don't have the confidence about cloud security system from those companies. So those companies are in necessity of framing the different possible security measures in cloud services. In the same time, security in e-learning materials also becomes an essential step to be taken in the system of e-learning process [8]. The discussion in the paper is made on issues and security mechanisms In many countries, large part of the financial budget is allotted for developments in education sector and a considerable focus is now on the e-learning systems. The internet facilitates e-learning opportunity for majority of the people across the country at low cost and minimum expenditure. Along with the development of the advanced facilities in the spreading the knowledge for the people a cross the nation through internet, problems related to the security also raises that needs to be considered very seriously for mitigation through the implementation of the possible security techniques and processes.With several combinations, such as signal transmission techniques and advanced web technologies and other hardware developments, it is found that e-learning is well established. The people at different locations are provided the facility of learning simultaneously in a more comfort and flexible ways.

### 2.1 Cloud Environment and Challenging tasks

As there are many facilities available for different domains in the technological fields, cloud process needs to consider more and more tasks for the framing of security mechanisms. There are many challenging points in maintaining the security methods as given under:

### 2.1.1 Primary security considerations

It is required to involve in the system the awareness or control of running criteria over the utility of the resources as they are being shared by the customers of third party. Most of the services are not of the similarities in characterizations with that from cloud systems. Hence it is to come across a little difficulty at the time of transferring the services of utility from cloud system to other different system. During the cloud services it is must to maintain a encryption/decryption keys by authorized users. There should be an essential step of ensuring each process of transferring, storing and retrieval of the information. And hence a combined method of these functions needs to be associated with certain standards.

### 2.1.2Data Lock-in

Data fixed in certain format by a particular cloud vendor cannot be transferred to the other, and it causes data lock-in. A continuous service needs to be provided with this lock-in system. And more technological updates are also necessary for the fixation of the data format so as to be convenient transaction of information in other cloud vendors.

### 2.1.3Deletion of the in secured and incomplete data

The permanent removal of information from the machine after an operating instruction is over makes the customer feel secure. This is one of the most challenging tasks to be monitored in cloud security system.

### 2.1.4 Increased demands security policy

With the facility that accessing the software without installation in machine and supported by the cloud server, it is very essential that a system of authenticity for accessing the software is to be established carefully to its authorized users. If the system fails to monitor reliability in maintaining the authenticated process, it may cause insecure problems in the usage of applications.

### 2.1.5 Browser security

Each assignment of the application process in cloud system needs to take the centralized servers. Since the browsing system is the only tool for customer to use cloud service, it is more important that modem web browsers needs to be framed and designed with certain standards of security

mechanisms which can be possible by XML signature and XML encryption [3].

over the sensitive data, cloud vendors are to be responsible for the leakage of data to the unauthorized users. A continuous monitoring on updation of security mechanism for the sensitive information must be made.

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## 3. Security Measures in Cloud Based e-learning

Various several security measures to overcome the security threats in cloud environment are:

### 3.1. Security measures taken in cloud computing econd-order headings

It is methodology implemented for security mechanisms to maintain awareness of its authenticated users for avoiding misuse and accessing of data by the third party.

- Location of Data presence: The data can exist in any location within the cloud network of different countries.
- Data segregation: The data in the process is to be such that it can easily be encrypted and algorithms of encryption can be verified at each step of the adopted methodology.

#### 3.1.1 The Security measures taken in cloud computing econd-order headings

It is to establish a team which gives certain instructions and suggestions in framing security system in accordance with clients and organization requirements [2]. The tasks and principles must be well organized in establishing the objective of security issues.

#### 3.1.2 The estimation process for applications in security system :

with It is a process that plays a vital role in deployment of any innovative step for the orientation of security and utility of cloud process. It functions on priority basis and involves in establishing a new methodologies that are favorable to secured applications.

## 4. A Brief summary of observation in the study

The main The analysis made in the paper includes coverage of security methods of various encryption techniques and data management at confidential

level [5]. These methods suggests the modern procedures to be followed by cloud based e-learning servers from possible vulnerable attacks. The most significant step is to prevent the upcoming attacks in different ways of approach in the latest era of web sphere.
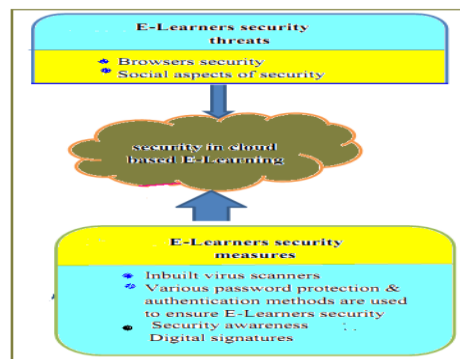


Figure 4: Findings and observations in e-learning stages at cloud system

The advanced authenticated principles are followed to avoid the possibilities of vulnerable attacks. There should facilities of inbuilt frame of authentication process for the companies and customers. Provision of password and security-id must involve in the cloud mechanism at e-learning methods.

## 4. CONCLUSION

The interesting conclusions are drawn from the study of the survey and empirical analysis. But the main key point in cloud based e-learning is to maintain security system as shown in the empirical studies. Some key security issues in cloud based e-learning technology are emphasized specially. Security management standards are helps to ensure the safety in mindset of customers. The present study suggests security certain management standards for safety processing of the cloud based learning. It will raise the CBE users without any fear over its security. And also various security measures are suggested in the empirical study are used to overcome the security threats in CBE technology. SCROM, ISO, IMS in CBE solution vendors are the e-learning materials for security issues in cloud based e-learning

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