**C. Security of the Implementations**

There are many security issues like as authentication, availability, confidentiality and integrity attacks is investigated under this work and specially an authentication attack from the above issues is carried out throughout the paper. Further, in authentication the session attack and design attack problems are rectified by using SSL (secure socket layer) and login with Captcha implementation respectively.

SSL (Secure Sockets Layer) is the solution to avoid session hijacking problem. SSL is the standard security technology for establishing an encrypted link between a web server and a browser. Moodle already has a choice for using SSL over certain critical actions. However such method cannot avoid session hijacking and user name prediction. In order to avoid such attacks, the entire site must create SSL connections with its clients.SSL (Secure Sockets Layer)link ensures that all data passed between the web server and browsers remain private and integral.

The cloud-based elearning is a step forward for traditional LMSs since it uses cloud computing infrastructure. The services provided by these companies can affect the educational system thanks to new technology advances such as smart phones, expert systems, and cloud computing. This proposed paradigm offers a feasible solution to the efciency and security issues. Confidentiality and security integrity are two of the most basic cloud concerns. The amount of the data sent concerns the user’s personal information. Cloud storage issues are addressed using cryptography and steganography techniques. Cryptography is one of the most extensively used and well-known methods for information security on a network. Additionally, the minimal cost of installation and the adaptability with which it can be altered to meet changing needs are two of the most compelling arguments for using cryptography for security.

The recommended security technique achieves data security, enhanced security, low delay, verifcation, and secrecy criteria.

The current study found that students with high participation had both high engagement and high performance. It can, therefore, be put forward that high levels of student participation can lead to effective learning. Designing online learning environments to help students interact (i.e. creating digital interactive tutorial videos) can enhance student participation and foster effective learning (Zhang, Zhou, Briggs, & Nunamaker, 2006). Technology and interface characteristics influence student interaction and participation (Vonderwell & Zachariah, 2005). Venugopal and Jain (2015) suggested providing a supportive technologybased learning environment by utilising various features available on most LMSs, which in turn positively impacts student engagement in the online learning scenario. Within the scope of the current study, asynchronous LMS activities such as interactive quizzes and digital instructional videos were included for the purpose of facilitating student interaction. These tools enable students to participate in their courses in different ways. Accordingly, it is of crucial importance to use online learning environment designs that foster student participation and interaction. Such designs enhance student interaction within the LMS system, which also promotes student engagement. Students with high levels of engagement are more likely to achieve high levels of learning. Closely monitoring student participation and participation patterns can help instructors to determine students’ needs and then to support their learning accordingly.

**Somehow related to perceptions:**

The assessment of Learning Management Systems (LMS) interprets that evaluating these systems is crucial for the effective implementation of distance learning courses. This data indicates that the important factors impacting distance learners' satisfaction include four independent variables: information quality, service quality, perceived usefulness, and system quality, along with two dependent variables: net benefit and user satisfaction.

In particular, system quality has the greatest impact on student LMS quality satisfaction.

System quality is user-system interaction effectiveness. System quality includes perceived usability, help options, speed, user-friendliness, security, and responsiveness. This study found that system quality explains 18.8% of student LMS adoption. Students adopted their LMS because it met their quality expectations.  
  
Information quality impacts LMS usability. If the LMS provides clear, accurate, and complete information, learners will find it easier to use. High information quality satisfaction influenced the study's respondents' LMS adoption. Survey respondents rated information quality the highest of the three LMS characteristics and explained