Assessment of Student Learning in an academic curriculum is a very challenging factor. Whether it is Open and Distance Learning (ODL), traditional face-to-face learning, online learning, e-learning or blended learning environment; the student learning assessment is a very time consuming process.

A large number of literatures are found in the online assessment of student learning. Computer Based Testing (CBT), Computerised Adaptive Testing (CAT) and Item Response Theory (IRT) are some popular assessment techniques. The student model is primarily used in Intelligent Tutoring Systems (ITS) but its use has been extended to most current educational software applications that aim to be adaptive and personalised. I have reviewed different student modelling methods.

Expert system (ES) is a branch of Artificial Intelligence that makes extensive use of specialised knowledge to solve problems at the level of a human expert. An expert system is a computer program that emulates the decision making ability of a human expert. Since the last two decades, lots of researches have been carried out in the application of expert systems in different domains such as medical, engineering, agriculture etc. But a few literatures are found in the education domain. Again most of the expert systems developed or under study are stand-alone in nature. Rapid advances in Internet technologies have opened new opportunities for enhancing traditional ES. With web based expert systems, knowledge on any subject can directly be delivered to users. Since the main function of ES is to simulate expertise and distribute expert knowledge to non-experts, such benefits can be greatly enhanced by using web based expert systems. The aim of my research
work is to apply expert system technology in the online assessment process of student learning where the expert system will emulate the behaviour of a teacher/subject expert.

Expert system based online assessment system is a relatively new area of research. The main idea of this research is to design a framework for web based expert system and on top of the framework develop a prototype expert system to assess student learning. The designed system is named as ESOA (Expert System for Online Assessment). A question database with varying complexity level is designed. Depending upon the student model (student's academic history and previous assessment records), the system fetches questions from the question database intelligently and presents to the student. After the completion of the assessment, the expert system grades the student and gives some feedback to show his/her weaknesses in the respective subject.

ESOA considers all the factors and constraints while conducting the assessment process. I have used a very popular expert system shell named JESS (Java Expert System Shell) in my research work. The prototype system is designed in J2EE (Java 2 Enterprise Edition) environment using MVC (Model View Controller) paradigm. The system integrates an external relational database designed with MySQL server to store question dataset and academic/performance history of the students. The rule base of the system is designed in the form of XML files.