

# Proper Use of Adaptive Learning for Student Modeling

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**Abstract:** In this paper, it described the application of Moodle adaptively: a definite but average learning management system. In Moodle, after a lots of study about the adaptive e-learning and the quality of being able to ready to perform a proper student modeling which includes the extension of Moodle with domain model, student model and tutoring model to do automatic identifying learning styles and automatic monitoring for a specific student. The future scope of this paper is to test the student's efficiency method and the student's assessment test by delivering course content.

**Keywords:** Adaptive Learning, Intelligent Systems, learning management, moodle, student modeling, activity locking

## I. INTRODUCTION

There are different students, learners whose have different learning styles, different characteristics. Here, the wide variety of the presentation is required for different leaners. In the presentation, it includes the different information of different learners in different format. For this reason, it is very important to make the adaptive learning system which focuses the learning styles and aspects of each learner during the presentation to deliver their lectures and information. It makes more effective, efficient to the learning process [1]. For the adaptive learning systems, the following identified learning requirements are:

- What thing a learner already know to comfortable their information
- If someone else will say you the same then you will accept it

## II. LMS

In the general purpose of the educational stages, it is required for the learners which consider information of practical test series to help them for increasing learning skills and to upgrade their knowledge skills and achieve the particular learning goals. Moodle is a learning management system whose source code can get openly. It delivers online educational system for variety of course content and settings. The virtual school, higher studies, vocational training all are including in these variety of settings. Moodle is online course content delivering approach as well as face to face delivering approach.

A supplemental assessment tool is used for face to face course content delivering approach. Apart from that, Moodle is working by using asynchronous educational tools where students can learn in different ways and different times. Moodle is also used by the synchronous tool. The output of this collaboration is the Moodle's intuitive and simple interface [2]. Moodle stands for Modular Object Oriented Dynamic Learning Environment. According to programmers, 'M' in Moodle is Modularity which is very important. This is very important capability

as reducing the time that required developing the modification of new versions Moodle [3].

After a lot of studying Moodle System, we got some adaptive features. They are as follows:

- Forums: The architecture of forum is in various ways, and including the peer rating of each and every posting. The settings of forum might be edited after posting till 30 minutes. These postings can be focused in different formats with some attachments. If the student wants, then a teacher can impose the subscription.

- Lesson: A lesson addresses subjects in interesting and formable ways. It has many pages in it, where one page points to another page. Contents and choices are given to students which incline the next page they see. It has two types of pages namely question page and branch table page [4].

- Question page contains multiple choice questions which have a question and multiple answers. In this students' needs to choose answer from multiple given answers.

- Branch table page where all the contents are listed and using this, students can go to any part of the lesson by using labeled buttons in it.

There will be navigation though lesson, which is either straight forward or complex. Type of navigation in a lesson depends on structure of the martial used for presentation.

- Wiki: Generally, by using different browser, wiki makes possible the documents to be authored collectively. It enables to change the course content. This feature showed to be very useful as a great degree of cooperation and activity [4].

Apart from grading, testing, the adaptive learning goals are providing a student's modeling process to add a brand new feature.

### III. ADAPTIVITY LOCKING AND STUDENT MODELING

During the other different models are presented, and then conventionally adaptive e-learning system have been divided into separate components as “models”. Most of the system including the following models [5]:

- Expert model: Expert model is made with the information which is to be taught.
- Student Model: in the student model, it is about the learners, what they learn and all. Tracking their system by student model.
- Instructional model: By this model, the data information will be transfer.
- Instructional environment: By this user interface, interact with the system.

In the student model, there are all data information related with the students that the system has collected. Then that collected data is used for adaptively. It continuously builds and updates the model. This model is known as student modeling. The two different ways of student modeling:

- Collaborative student modeling: for build and update the student model, it needs some specific response which is providing by the learners. For some situation, the data information are providing by the students/learners for the student modeling mechanism such as stating specifically either a page was related for his learning goal.

Apart from this, one chance is that, the learner can directly update their details, information in the students modeling. Another chance is that, for learners, they do adaptation in e-learning system by him/her and then they display what their hope in the student modeling system.

Moreover, student modeling can be done statistically or dynamically. Static student modeling is the approach where the student model is initialized only once. Wherever, in dynamic student modeling, it updates the table of student modeling repeatedly.

Flexibility can be provided once information about the scholar is available from the pupil model.

A number of methods exist for providing pupils with flexible courses. These methods resolve which features of the system are different for different scholar. Flexibility features can be classified with reference to their desire into two groups, namely for Flexible presentation and Flexible navigation support.

Flexible navigation help is based on links and have features such as direct guidance, map adaptation, as well as adaptive sorting, hiding, defining and generating of links.

Flexible presentation includes Flexibility features based on content such as adaptive multimedia presentation, adaptive text presentation, and adaptation of approach.

An example of adaptive navigation support in Moodle is the Activity locking [6].

The basic concept grip a pupil out of a definite activity till the pupil meets a score, a time or a view criterion matrix for one or more definite activities or assets in a course. In some versions, there are privilege to hide the griped activity, or hide a complete category of activities and

resources. Other options added showing a progress icon next to fully over activities. Some particular conditional activity griped is based on an overall course criterion matrix. With this tool, the tutor is the only one who can change or hide/show activities and resources based on his/her evaluation of the individual differences of his/her pupils. So, tutor or instructors, who are generating a course, should prepare some substitute version of the course for better or weaker pupils. A much more powerful approach it's a flexible arrangement of learning courses/activities for each specific learner based on a pupil model updated after each interplay with the learner. The pupil takes some type of quiz/survey, etc. each time he enrolls to a learning aim. Based on test's results, only the exercises the pupil needs to complete will appear in the course.

### IV. ADAPTED LEARNING GOALS

This feature is developed by the researchers. They research that the learning style for a particular learning objects how it changes dynamically and what learners sees as links of activities and resources in the learning goal page. A learning goal is made with some courses; it may be one and may be more than one. Those are made of the set of learning objects and their pre requisites, which includes learning objects. The researchers worked by the combining and sequencing the learning objects dynamically. The combination of learning objects means:

- The learning objects are already rebuilt and able to use it again.
- The learning objects are already including in the course content.
- The learning objects identified as a required by the learners based on some assessment.
- The pre requisite date in stored as metadata.

After finishing all the formalities of every learning goal, the learners have to pass the test which is linked with the learning goal. If it is successful, every learning object's goals will be hidden from him. When the learner enrolls to a new learning goal, he doesn't have to make tests linked to learning objects which are already hidden to him.

To fulfill this task we added the following tables to Moodle's database:

- Learning\_goal: It is the table where all the data information of learning goals is registered.
- Lg\_contents: this table tells of which courses every learning goal is made.

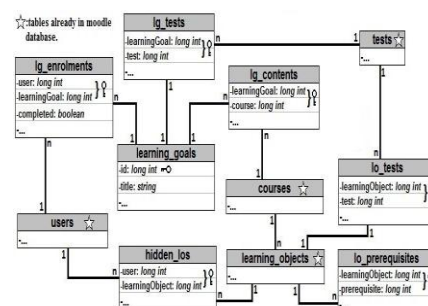


Figure 1: New Tables in Moodle's Database Structure

- Lg\_enrollment: this table shows which user is enrolled to each learning goal.
- Hidden\_los: it stands for hidden learning objects.
- Lo\_prerequisite: learning object prerequisite is recorded in this table.
- Lotests: learning objects links t test are in this table.

Apart from this table, we had to recreate some Moodle's web pages which is carrying the method, approaches which is used in previous task.

a) Creation of learning goal: We made a new page for the tutor in intelligent tutoring system to create a learning goal and link to assessment test. Different kinds of activities update learning-goals, lg\_contents, lg\_tests.

b) Link test: After creation, the learning goal, Moodle page is link with the test where the learner can give the exam for a particular learning object. This updates the lo\_test table.

c) Adding pre requisite: after creation of the learning goal, Moodle page is adding the learning objects as pre requisites. This updates the lo\_prerequisite table.

d) Opening and final tests update: Since, we did not make any changes in Moodle page test, we added tests while the student enrolled to a new learning goal and the student has presented to visible learning objects. After the test, if the learner has been successful then it updates hidden\_los table.

## V. CONCLUSION

The researcher researches after a lot of study that the Moodle is extended with a specific domain model student model, tutorial model to perform the identifying learning style automatically and sequencing the learning materials for each and every learner.

This is upgraded if the presentation is adding and adaptive support. The educational goal is to adapt the course process as shown by some parameters i.e. learning style abilities and their performances. There are different ways to learn for the learner. The student can choose anything like different types of works, different kinds of exercise, pre assessment test, and post assessment test. Apart from these different kinds of group work is also noted.

This developed method will be tested while the Tempus IV Project JEP158979 – Leadership in Higher Studies Education Management which provides formed the high professionalism in web learning management system. The expected output is related with the effective training for many different types of students in a particular international environment.

The researchers researches to some problems related with the role of e-learning web 2.0 definition but also it can be adaptively and identifying automatically.

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