

Making Tests Using the Moodle Quiz Module

Andrew Gorringe

John Anderson

Abstract

Recently the open source, online, Learning Management System called Moodle has been increasingly used in many schools, colleges and universities throughout the world. In addition to the many module activities that encourage student learning, Moodle's popularity among educators is also due to the ease with which it can be used for assessment. The quiz module, one part of this software, enables teachers to design and develop test items and tests specifically tailored to their and their students' needs. The object of this paper, therefore, is to describe how to develop valid and reliable tests using the quiz module of the Moodle software. The first part of the paper will introduce the Moodle software and describe how Moodle, and specifically the quiz module, is being used at Kwassui. Next it will show the kinds of test items that can be created in the quiz module, and how these items can be used to generate tests. Finally the paper will describe how the items and tests can be analysed and validated. By using the quiz module of Moodle, educators can create their own in-house tests specifically geared to meeting their own learning and assessment objectives.

Introduction

Moodle is an open source online Learning Management System that is being used in schools, colleges and universities all over the world. One of the parts or modules of this software is the quiz module which enables users to design and develop various test items and tests. The object of this paper is to describe how to develop valid and reliable tests using the quiz module of the Moodle software.

Before dealing with the specifics of testing, however, an

introduction to and overview of the Moodle software will help the reader more fully appreciate the wide-ranging uses of Moodle tools, and more specifically, how well-matched they are to a language teaching and language learning environment. Please note that in this paper we are writing about using Moodle Version 1.9.

Moodle

Moodle is often described as an open source online Learning Management System (LMS) or Virtual Learning Environment (VLE). While there may be a slightly different nuance to the two terms, the basic idea is that students are engaged in interactive computer activities, often in conjunction with the Internet. Open source refers to the fact that there is a licensing agreement and users have access to the code. Practically speaking, Moodle is free, flexible, and easy-to-use software that helps teachers manage and promote learning. It is a platform for teachers to create engaging and effective learning activities specific to their own teaching and learner needs.

Moodle as a learning tool

As we all know, there is a great deal of “teaching” being done in classrooms around the world. We cannot be assured that an equal amount of “learning” is also going on! Moodle software facilitates and supports learning; in other words, it helps students learn. The student is at the center of the learning, and the interactive activities are engaging and motivating. The learning experience is not limited to a classroom or computer room. Students can work from anywhere, alone or in collaboration with classmates (working on a project from different locations, for example). They can also get instant feedback on their work, and easily monitor their own progress. Finally, Moodle is easy to use in conjunction with the Internet, giving students access to a wealth of multimedia data.

For teachers, the flexibility of Moodle is a key point. It can be part of a course, used for a range of assignments or homework activities, for assessment and grade-keeping or as a full online course. Teachers are able to interact with students individually, selectively, by group, or with the class as a whole, in various ways. It is a great

management and organizational tool for teachers, and it is easy to store, adapt and add to over time, improving a course and creating a bank of learning activities. A final note-worthy strength of Moodle is the support it offer teachers, with instant access to extensive resources, discussions and help on the main Moodle site.

Moodle and language learning

Moodle can be used for virtually anything that goes on in traditional classrooms: the 4 basic skills, vocabulary, grammar, pronunciation, research, presentations, etc. It is excellent for developmental writing (constructive and detailed feedback, and a record of the text development) and fluency development (both written and spoken). It is also a wonderful tool for using multimedia content; it is easy to embed video and audio files and build student web pages.

Standard modules in Moodle

In addition to the “Quiz” module of Moodle, there is a diverse range of activities and tools for teachers and students in the following modules: Assignment, Chat, Choice, Database, Forum, Glossary, Hotpot, Lesson, Resource, SCORM, Survey, Wiki and Workshop. For a description of these and other modules, visit: <http://docs.moodle.org/20/en/Category:Modules>

The Quiz module at Kwassui Women’s University

Moodle started to be used at Kwassui during the 2005-2006 academic year (Mazzarelli and Gorringe, 2006), and in the next year it was decided to use the Quiz module to develop a computer based placement test that would replace the CASEC (Computerized Assessment System for English Communication), a commercially available placement test that is widely used in Japanese Universities. The initial placement test was created in, and administered through, the Moodle Quiz module at Kwassui in June 2007 (Gorringe, 2008). The test had 100 multiple choice vocabulary items and was administered to 57 first year students. It was found that the test had

a reliability of 0.80 (KR-21) and had a correlation coefficient with the CASEC test of 0.69 (Pearson's r). Since this initial trial we have refined the original placement test and now use it to place most students who study English at Kwassui into ability groups. This includes both those who major in English and those who do not, and in 2011 this amounted to some 250 students. In addition to using the Quiz module for the placement test, teachers at Kwassui have used it to make progress tests and achievement tests using the different types of questions that can be created in the module.

Test items

In the Quiz module we can create the following question types: Multiple Choice, Short Answer, Numerical, True/False, Matching, Embedded Answers (Cloze), Random Short Answer Matching, Random, Description, Calculated, and Essay. Once these questions have been created, they can be put into different item banks (called "Categories" in the Quiz module). Numerical and Calculated questions are for science / mathematics and are not relevant for language tests. The two Random types, as the names suggest, take any random questions from the particular category. A Random Short Answer Matching question merely randomly takes short answers from the current category to create a Matching question. We can add sound, video and images to any of the question types.

It is also possible to import questions into the Moodle quiz module from other programmes and in various different file types. The module can import these formats: Aiken format, Blackboard, Blackboard V6+, Course Test Manager format, Embedded Answers (Cloze), Examview, GIFT format, Hot Potatoes, Learnwise, Missing word format, MoodleXML and WebCT format.

Tests

Once questions have either been written or imported into the quiz module categories it is very simple to create tests. First we create a Quiz on the relevant Moodle page in a particular course. We can define the time and date when the quiz will be taken and set a timer. We can have the test in a reasonably secure JavaScript

enabled browser pop-up window, where copy and paste are disabled (for greater security Safe Exam Browser is recommended). There is also the option to shuffle questions and / or answer choices again increasing the security of the test. When the parameters of the test have been set we can easily add any questions that have previously been created or imported (Figure 1) by checking the items we want and adding them to the test.

Figure 1



Analysing items and tests

Once the test has been completed we can see the results of the test by clicking on the results tab. Apart from the Essay questions all the questions are graded automatically and in the case of multiple choice questions we are given some “Item Statistics” based on classical test theory (Figure 2).

By analysing these item statistics we can improve the quality of the items used in the test and increase the test’s reliability and validity. As can be seen from Figure 2 the Moodle Quiz module has the following statistics in the Item Analysis Table: R. Counts and R.% refer to the number of responses to a particular item and the corresponding percentage. For example, the response “asked” was chosen by 17/178 (10%) of test takers. The next statistic is the % Correct Facility index which shows what percentage of test takers got

Figure 2

Item Analysis Table

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Answer's text	partial credit	R. Counts	R.N.	% Correct Facility	SD	Disc. Index	Disc. Coeff.
asked	(0.00)	12/178	(10%)	79%	0.411	0.23	0.23
called	(0.00)	4/178	(2%)				
collected	(5.00)	146/178	(79%)				
bought	(0.00)	12/178	(10%)				

the correct answer for each item. The correct answer “collected” had a facility of 79% meaning 79% of test takers answered the item correctly. The next statistic is the SD or Standard Deviation of the item which measures the spread of answers among the test takers. The Disc. Index is the Discrimination Index which measures the extent to which an item discriminates between high ability and low ability test takers. The scale of this index is from -1 to +1 with the higher the positive number the better. A negative number would indicate that more low ability test takers answered an item correctly than high ability learners. The final statistic is the Disc. Coefficient or Discrimination Coefficient which like the Discrimination Index shows how much an item can differentiate between high and low ability learners and uses the same -1 to +1 scale. The difference between the two statistics is that the Discrimination Coefficient uses all the test takers to determine its coefficient whereas the Discrimination Index uses the top third and bottom third of the test takers. This means that the Discrimination Coefficient is the more sensitive of the two statistics.

The item in Figure 2 has a Discrimination Coefficient of 0.23 - this is reasonable but to make the test more effective we should have a higher value. Often the problem with a particular item are the distractors and with the item in Figure 2 the distractor “called” has only 4/178 test takers choosing it. If we change this distractor the item may work better and discriminate more effectively between high and low ability test takers. By going through and checking each item in a test we can make the test more reliable and valid, and the item analysis table in the Quiz module gives the instructor a simple and

efficient way to do this.

Of course, merely checking each item statistic will not allow us to be able to determine a complete picture of how reliable and valid our test is. We would need to do other analyses such as finding the Reliability Coefficient of the test or correlating the test with other tests to find the Concurrent Validity, however the Moodle Quiz Module does give us some help in achieving the goal of creating a reliable and valid test.

Conclusion

The Moodle Quiz Module is an excellent part of the Moodle learning system. With this module we can easily create or import a wide variety of test items. The test items can be banked into various categories and can then be easily added to specific tests. These items can include images, audio and video and can be easily and securely administered thorough the Moodle interface to test takers. Once the test has been taken the items are automatically graded and analysed. This allows test administrators to be able to change and improve the test quickly and efficiently. The Moodle Quiz module therefore, gives us the ability to create our own valid and reliable computer based tests and the freedom to tailor our tests to the specific needs of our students.

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