

Features of an online English language testing interface

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This paper describes an online English language proficiency testing platform that uses Moodle- hosted selected and open response questions along with other useful features. These features include enhanced test security settings aided by the Safe Exam Browser; an embedded MP3 player for listening skills; and a split screen mode for reading tests. The paper highlights significant elements of this particular approach to testing as they apply to formal high-stakes e-exams (testing of learning) and for continuous assessment (testing for learning). Snapshots of sample online test materials illustrate these features. Issues of concern in the field of web-based, computer-assisted assessment will be discussed in light of experience gained from a recent pilot study in which this interface was used in a series of mock exams in 2015.

Keywords: Moodle, web-based testing interface, technology-enhanced language assessment

A Moodle-hosted testing interface

Moodle (<https://moodle.org/>) is a course management system that is used by educators worldwide for teaching and learning purposes. The Moodle quiz feature is one important component of the teaching and learning process where quizzes and tests are set up using this quiz tool. Given the rapid developments Moodle has gone through in the past few years from one version to another, the Moodle quiz feature has been improved to accommodate a variety of educators' testing needs. A number of plug-ins have also been developed for this purpose.

An enhanced Moodle-hosted testing interface was developed by the researcher by combining several pre-existing technologies to provide a set of features targeting the testing of English language proficiency skills. The context is the Language Centre at Sultan Qaboos University in Oman, where Moodle is the university-wide e-learning platform. Moodle 1.9 was the version available at this institution at the time of the study and so it was used in the creation of the interface. However, the principles outlined here are equally applicable to more recent versions of Moodle. To reflect a testing philosophy embracing the need to create a better testing experience using Moodle as an e-assessment tool, the researcher embarked upon a research study to develop and trial a Moodle-hosted testing interface. The researcher made use of the Moodle 1.9 quiz feature and applied some other features to create this better testing experience for its users. The following sections describe the features and the rationale for applying each with references to the use of the interface features to trial mock exams in a recent 2015 pilot study. Illustrative snapshots of these features will be provided.

Enhanced test security settings aided by Safe Exam Browser

First of all, the most important feature of the interface is applying enhanced test security settings. The standard settings on the Moodle platform allow designers to create password-protected tests. This limits access to individuals or classes with knowledge of a common password (for example; the password can be displayed at the front of the room once all candidates are seated in the exam room). These tests can also be timed and a time remaining count-down timer can be displayed to each examinee. The number of attempts allowed for each test can also be set. However, heightened test security can be accomplished by using Moodle in conjunction with a security browser called Safe Exam Browser (version 2.0.3). This browser is an open source application that allows access to other computer functions and web resources during online exams to be controlled or prevented. When using the Safe Exam Browser, the test is seen in a full screen mode limiting web navigation and access to unauthorized internet resources. The computer operating system shortcuts and functions such as right-click to copy or print screen to take snapshots of exams, task manager or program switcher to control access to the operating system are disabled to prevent cheating during the exam. [See *Safe Exam Browser* (2015) for details on this browser]. The traditional approach of supervising

the exam to prevent cheating is still recommended when using this type of computerized exams. As Coy (2013) and Myrick (2010) recommend, for high-stakes tests, such security measures provided by Moodle settings should be combined with test proctoring or invigilation to achieve "high security" (Coy, 2013, p.59).

Thoughtfully, applying the enhanced test security settings described above can be a very important precaution in the testing process in order to ensure that technology-related issues do not affect examinees' test performance. Measurement error variance in the test scores might be attributed to the presence of construct-irrelevant (Brown, 2005; Davies, 1999; *Standards for educational and psychological testing*, 1999) technology-relevant issues that can threaten reliability and validity of the inferences of web-based assessment (Fulcher, 2003). From this stand point, the use of enhanced test security settings aided by the Safe Exam Browser can limit the effect of construct-irrelevant technology-relevant sources of measurement error leading to a better testing experience where examinees' cheating behavior is monitored much more closely.

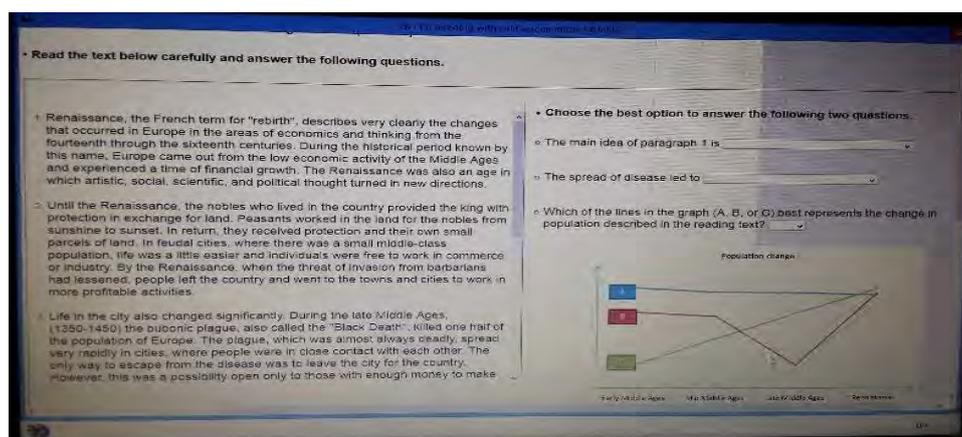


Figure 1: e-exam with Safe Exam Browser

As can be seen in Figure 1, no navigation elements are allowed. The way this browser was used in the study was that computers were set up to run the browser and then examinees were logged into the browser with a special log-in password. The browser was configured to open the SQU Moodle 1.9 e-learning platform automatically with no other websites permitted. Examinees were then logged into the Moodle course where the exam was located at which point they were able to start the exam. If they attempt to access the exam from a regular browser such as Internet Explorer or Chrome, they receive a message informing them that it can only be accessed using the Safe Exam Browser. Using the standard Moodle quiz security settings aided by the Safe Exam Browser and exam invigilation can, therefore, put much more enhanced security measures into operation.

Matbury's MP3 player for listening tests

Since language tests usually include listening test components, finding a suitable mechanism to allow for control playback of audio during an e-exam is important. Typically, examinees are provided with recordings to respond to relevant exam questions. The researcher decided to use Matbury's MP3 player for listening tests (Figure 2), which is a Flash MP3 audio player suitable for playing listening test audio recordings embedded in Moodle.

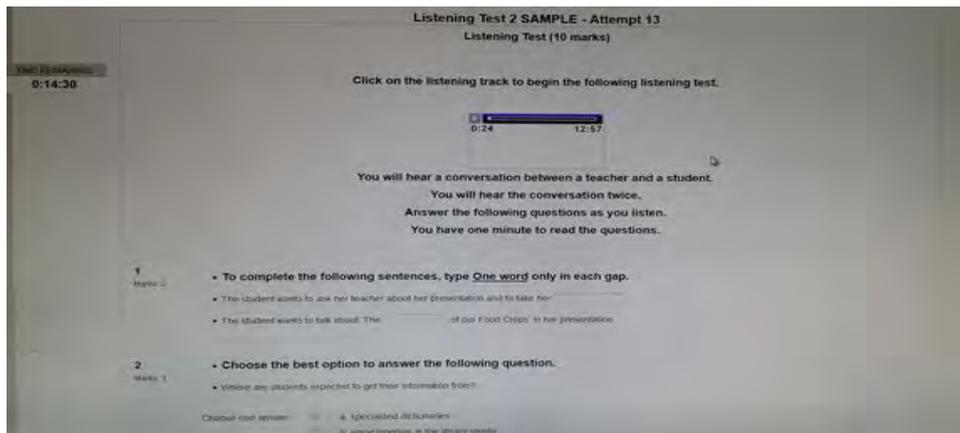


Figure 2: Embedded Matbury's MP3 player for listening tests

The way the player works is that it controls the number of times examinees can listen to test audio recordings and no playback, forward, pause, or stop functions can be controlled by examinees after hitting the play button. Test designers wishing to use the player for listening tests may refer to Matbury (2010a, 2010b) for instructions. To embed this player into the Moodle quiz in the study, the MP3 player file and audio files for listening tests were first stored in the Moodle course files. These files URLs were then linked to in the listening test Moodle Description questions by editing the player's HTML code to load audio files within the listening test.

As mentioned before, technology-relevant issues can be a major source of measurement errors caused by the fact that examinees' test performance gets affected by the presence of technology-related problems (Fulcher, 2003). In the case of the Matbury's MP3 player for listening tests, the player is intended to be used in the online testing interface to ensure that all examinees are exposed to the listening materials in a fair way. Fairness can be achieved here by enforcing a standard technological practice in exposing examinees to the same listening input so that everybody listens to the audio recordings the same number of times (e.g. once or twice). Another fair technology-related practice is not to permit pause, stop, or play backward or forward options for all examinees so that they cannot control the listening input. Once all examinees are fairly treated in such a web-based testing environment using standard practices assisted by the use of Matbury's MP3 player, issues related to differences in the way technology is manipulated by examinees can be within the control of testers. To meet test fairness (Chapelle & Douglas, 2006; Fulcher, 2003; Kunnan, 2004) principles, such a player should be used to fairly expose examinees to the same listening materials in a similar manner leading to more reliable and valid test-based inferences and decisions. Of course, if it turns out that major issues in the use of such a player make it difficult to meet such test fairness goals, reliability and validity may still be questioned. The argument made in this paper is based on one of the exam trials carried out in this study in which the listening audio file did not load at all in one of the classes taking an exam due to a software-related update problem, namely Adobe Flash Player. The lesson learned from exam trials is that it is absolutely necessary to check all testing equipment for such online testing before going ahead with official exams upon which examinees' futures are determined. The same can definitely be said about any other technology-enhanced web-based testing tool.

A split screen mode for reading tests

Part of the pilot study was the involvement of expert judges working as English language teachers and testers in the study context in a judgmental validation session to review an initial prototype of the Moodle-hosted online testing interface. A major feedback point was that it is preferable that examinees view reading tests and questions side by side in some kind of split screen mode. The researcher took this valuable viewpoint into consideration and started exploring ways to create a split screen mode for reading tests using the Moodle quiz feature. Eventually, it was possible for the researcher to work with Moodle to create this split screen mode from scratch. The way this was done was by creating a table with two cells, one for the reading text and another for the embedded questions using the embedded, multi-choice, cloze question type on Moodle 1.9. The final view shows the reading text on the left side of the screen and the questions on the right side. A code for a vertical scrolling bar to access the entire reading text was embedded in the HTML text-editor of Moodle

embedded question type with assistance from James Scully, the Language Centre's E-Learning Coordinator.

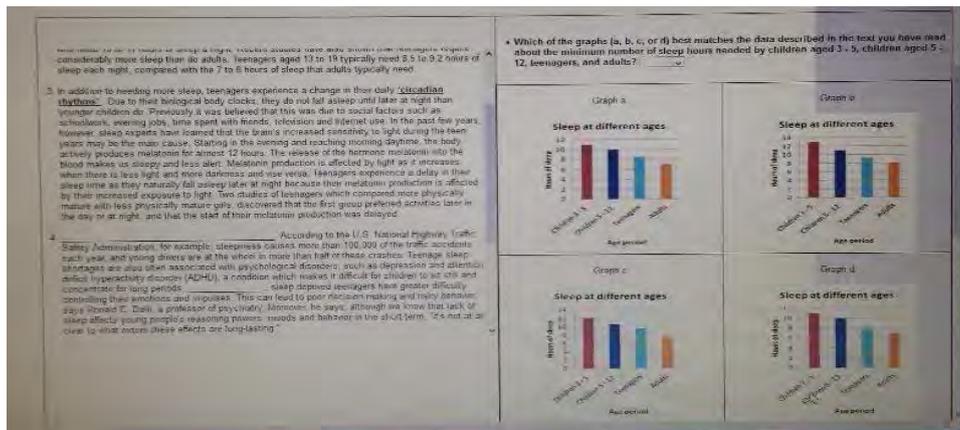


Figure 3: Split screen mode snapshot

Using this split screen mode feature (Figure 3), examinees can scroll up and down to read the reading text paragraphs and simultaneously access the relevant questions on the same page. This is contrary to many paper-based exams in which examinees have to flip papers to connect the entire test questions and the reading text. It is assumed here that presenting the reading test materials in a split screen interface should increase concentration during exam-taking as it can reduce split attention and cognitive load demands caused by the way sources of information or testing materials are presented to examinees. Split attention principle as part of Sweller's (1994) cognitive load theory (Ayres & Sweller, 2005) might help explain the assumed benefit of a split screen interface. The restructuring of the test format using the split screen interface can be of such benefit to examinees since it is assumed that it can reduce the need for accessing multiple sources of information within the test (i.e. reading passage and subsequent questions). This can best be explained by the split attention effect that examinees using multiple sources of information might encounter compared to others using integrated information (i.e. restructured test format using the split screen interface). By using the split screen mode for reading tests, the negative effect of the need for split attention and the subsequent increased cognitive load can be eliminated. In the pilot study feedback, examinees expressed their satisfaction with the split screen mode for the reading tests pointing to a much more positive testing experience than the paper-based exams.

Remarks and conclusion

This paper describes a Moodle-hosted online testing interface and its features. It does not describe the full detailed results of the pilot study trials of these features, but it does describe the application of these features and the rationale for their use for language testing purposes. Precautions should be exercised whether these features are applied for formal high-stakes e-exams (testing of learning) or for continuous assessment (testing for learning). This is to ensure that any construct-irrelevant technology-related issues or problems do not creep into the testing process and threaten reliability and validity of test-based inferences and relevant decisions. This paper is practical rather than theoretical in its exploration of issues that educational designers might need to consider and address. Considerations addressed here include design features to improve the examinee's experience; steps to minimize or prevent cheating; and ways of preventing tech-induced impediments to successful performance in exams. These considerations are important when designing a language testing interface and relevant regardless of the learning management system used. Having said that, however, this paper is limited in scope and presentation of theoretical grounding because it is descriptive rather than critical in nature. As clearly described in this paper, this was a pilot. A future publication should describe a larger scale study that followed this pilot employing improved design features of the online language testing interface. This other follow-up future publication will address research questions of the study and thoroughly present evidence-based theoretical and critical insights into the tech-induced issues briefly discussed here.

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