Combining Streaming Video and Online Testing to Enhance Learning Assessment

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Abstract

This paper will focus on a system for time manipulation during online quizzes to augment the fairness of student assessment and lessen the likelihood of student cheating during quizzes. Although the technique discussed in this paper may be successfully applied to a variety of classrooms and subjects, a language education classroom will be employed as an illustration of how this technique can be implemented and how it functions. This paper will also describe the simultaneous use of Moodle and YouTube as concrete examples of tools to deliver quizzes in this manner. It is to be noted, however, similar ends may be achieved through the use of other tools such as Google Classroom, Teams, Vimeo, or other educational and video sharing tools once the basic principles are understood.

Rationale

Assessment in formal education may take many shapes, ranging from student reports or experiments to rigorous written examinations. Regardless of form, assessment is almost always both an integral part of the educational process and a requirement. In some circumstances, such as licensing programs or qualification regimens, an examination itself can be the raison d’être of an educational course. Given the importance assessment plays in formal educational settings, accuracy and fairness are imperative in the assessment process. The absence of either one means students will be unable to properly assess their own performance and the teacher may be unable to monitor student progress. In extreme cases, the validity of the educational organization can even be called into question.

The important criterion of accuracy demands that the assessment correctly reflects the abilities or achievements of the students being examined through the assessment without outside influence. While a majority of students would undoubtedly prefer an accurate assessment of performance or achievement, the criterion of accuracy may run counter to the desires of certain students fearing lackluster results. This, in turn, necessitates the elimination of cheating of any kind, resulting in elaborate systems of prevention, detection, and punishment.
A cursory review of many of the tools of prevention and detection suggest a prevalence of environmental manipulation by the testing teachers, officials, or institutions.

The confirmation paper sent to IELTS test candidates in 2020 provides an illustration of how seriously environmental manipulation is viewed. Testing candidates are informed of security measures to ensure the correct candidate takes the test, including the use of passports as identification and a finger scan, and that there are additional stringent measures in place for the testing environment. Only regular pencils (no mechanical pencils) and erasers without covers are allowed. Only non-carbonated water in a transparent, non-colored bottle with all labels removed is permitted. The only other personal items allowed into the testing room are identification and copies of identification. The application form for the test itself includes similar information (International English Language Testing System, 2020). The TOEFL test in 2020 prohibits candidates from even bringing pencils into the testing room (Educational Testing Service, 2020).

Universities may offer varying degrees of security depending on the type of test administered. Entrance examinations in Japan tend to be much stricter than regular classroom examinations. The national university entrance examination testing centers display stickers at each examinee’s assigned seat listing what may and may not be on the desks during the tests and announces to examinees in advance what they may or may not have or do during the test (National Center for University Entrance Examinations, 2019).

Under normal circumstances, tests and quizzes administered in university classroom environments may deploy some devices for prevention and detection of cheating; they do not require such extreme measures as those for the two language assessment tests mentioned above. However, the basic concern for manipulating the testing environment is fairly consistent and present.

What happens when the ability to manipulate the testing environment breaks down? The COVID-19 pandemic has posed something of a challenge to the smooth operation of these security measures.

The pandemic has forced many educational institutions to rely on remote education, thus greatly reducing the teachers’ abilities to control educational assessment environments. By wrenching the ability to exercise their control over the educational and assessing environments from many teachers and institutions, the COVID-19 pandemic has enlightened educators and institutions of higher learning of the precariousness of some of the systems they rely on.

Anecdotal evidence suggests that discomfort among teachers arising from this loss of control has led many teachers to shift the chosen form of assessment from testing to student-written reports. The move towards student-written reports may also be driven
by a desire of educators to find a method of assessment which both encourages students to rely on their own achievements and abilities while simultaneously discouraging cheating and plagiarism. Speculation aside, it must be conceded that many educators have suddenly found themselves thrust into an unfamiliar pedagogical landscape and their lack of confidence in creating their own online tests is partially responsible for this trend towards relying on reports.

As mentioned above, one method of preventing, or at least reducing the possibility of cheating, is the manipulation of the assessment environment. In remote learning environments, the manipulation of time available to the examinees and restricting how that time is used can be an effective way to manipulate the environment to prevent cheating and ensure fair and accurate evaluation.

Normally, listening comprehension plays a significant role in language education. Accordingly, language teachers are familiar with listening comprehension sections of assessment tests, how they are constructed, and how they are administered. Listening comprehension tests usually contain elements of time manipulation due to the very nature of speech. The speed of the listening materials presented, the time between each sample of material, and the length of each sample are examples of those elements.

Through controlling and restricting the availability of time, teachers can to some extent restrict students’ access to resources outside their own learning, abilities, and achievements. It would require a very temporally dexterous examinee to be able to employ a dictionary during a listening test with much success. This feature of listening tests suggests that control of not only the total time available to answer questions is important, but also control of the time allowed for each question also can hamper students’ abilities to use external resources. If time is restricted so that students are unable to both answer the questions and search for answers through external resources, then the likelihood of cheating is at least to some extent alleviated.

One method of accomplishing this “micromanagement” can be by presenting students simultaneously with two different delivery systems, which are complimentary, but also create a tension which forces the students to answer all questions quickly, while combining information from each tool. In other words, to answer any particular question, the student would need to apply information from each system, or resource, and mentally process the information in order to answer a question in a timely fashion.

At this stage, it is important to consider how the use of two differing tools, or delivery systems, can accomplish the goal limiting students’ ability to resort to external resources.

Readers familiar with Moodle, for example, may be cognizant that its quiz feature limits the total time available for students complete a quiz.

This time limitation can be accomplished two ways in Moodle, namely, “quiz timing” can be used to limit the times quizzes both open and close. The “time limit”
feature can limit the number of minutes students have access to a quiz once they start a quiz (Moodle Project, 2020). These two features can, of course, be combined to allow, for example, any thirty-minute quiz period during one hour. However, neither of these two features control the amount of time students can spend on any individual question. At present, Moodle’s quiz feature does not allow for individual timing for each question. As long as the amount of time for each question remains uncontrolled, students retain the ability to adjust their speed in answering individual questions, allowing to some degree of freedom to make use of unacceptable, external resources to answer questions by answering some questions more quickly in order to leave more time open for others.

The introduction of a second delivery method, namely the video element, when appropriately paced, adds control over the time allowed for each question within the overall time limitation. Put another way, while Moodle can control the overall time spent on a quiz, a video combined with the Moodle quiz paces student time use within the total time. Stopping or slowing the video to devote time to searching for answers means the examinees will answers fewer questions, thus lowering the score, thus lessening the incentive, and the rewards, to cheat to find answers.

The examinee’s perspective

In order to fully describe an example how this time manipulation system functions, it is important to consider the experience from the learner’s perspective. How does this system for testing administration appear to the students?

For the sake of simplifying the description of the examinees’ perspective, this discussion will make the assumptions listed below.

The quiz will be administered to all students simultaneously in an online class where all students have access to both the website hosting the Moodle quiz and YouTube. For this example, the total time for the quiz is assumed be 30 minutes, excluding time for instructions.

Instruction on how to take the quiz may be best delivered separately from the quiz and main video and before the start of the quiz. The instructions for the quiz will inform the students that they will be given information in the video portion of the quiz which they will be required to use in order to answer the questions in the Moodle quiz. The students are also informed that if they stop the video or slow its speed, the result will be that they will be unable to answer all questions of the quiz.

It is assumed that when the students are given the instructions, they are all logged into the Moodle site and the relevant course on the site. They should also have already opened the browser through which they will access YouTube. If they have not, they should access both resources as soon as the instructions are completed.

Before beginning the quiz and after confirmation that all students are able to access the appropriate resources, they first receive a URL for accessing the YouTube
video and then the password allowing them to open the quiz. As the time limit for the quiz begins upon first access, it is important to limit any possible problems with timing or synchronizing by delivering the access information in this order. This order allows the students to begin the introduction to the video without adversely affecting the time limit of the quiz.

It is to be noted here that slight time lags may occur as the video begins, so the video portion may actually be only 28 or 29 minutes in length, excluding any conclusion announcing the closing of the test. It would be unfair to present examinees a video of 30 minutes in length for a Moodle quiz timed as exactly 30 minutes, due to the short time required for the students to synchronize the quiz and video and the time for the students to actually begin the quiz. Fairness is another criterion which must not be neglected.

As the video begins, a visual or audio cue is supplied to announce the students should begin the first question. The video will have a title and an introduction slide in the beginning to inform the students they are indeed viewing the correct video and to allow them a brief moment to synchronize the quiz with the video. It is to be noted here that if many students are accessing the quiz through mobile phones, then it would be of benefit for the students if most of the important information from the video come from the audio portion of the video. Audio cues allow the examinees to listen to the video while looking at the Moodle quiz on their screens.

Assuming that the examinees are using computers, the students may be exposed to written and aural information in the video regarding the questions to be answered. Whether a written question is provided or not, the students should be clued to which question the video is posing through at least a visual clue, such as a question number, to ensure that the students has properly synched the video and the Moodle quiz. If a student should carelessly align the video and the quiz incorrectly, it goes without saying that the final result will be disappointing at best. Clearly indicated questions are quite important in this system.

As each question in the quiz appears in the video, the examinee is required to answer within the time allotted for that question. Once that time expries, the video moves on to the next question, essentially forcing the examinee to continue on to the next screen and the next question, although Moodle does allow multiple questions on a single screen where that is appropriate.

One example of a type of question that can be administered would be a multiple choice question where the question is contained within the video, but the answer choices are displayed only in the quiz itself. This requires the student to use both resources simultaneously, as one without the other is next to useless. A cloze question requiring the examinee to provide a missing word to a sentence either written or spoken, would be equally challenging.
After the students have progressed through the video and quiz, the quiz should be submitted either manually or automatically depending on how the quiz was originally set up, as discussed below.

**Quiz design**

This paper will now examine the creation of the Moodle quiz as it pertains to its use in this particular technique. It will then turn its attention to the video creation portion of the project. A number of factors must be taken into consideration when creating the material, i.e., the video and the Moodle quiz and their contents.

As the contents of the questions and the types of questions are paramount, these will be assumed in this discussion to have been considered beforehand.

When creating the quiz and video, it is generally preferable to create them in tandem. This will help ensure that that the materials in each resource are in the same order and are compatible, in other words, it helps ensure that what the examinees hear and see in the video and in the Moodle quiz are coherent and valid as testing material. No teacher would present the testing materials to the examinees without proper review before the testing session, but tandem creation will alleviate some of the necessity of tedious reediting before the test session. Another advantage of creating the two resources in tandem is that when the video is created as the Moodle quiz is created, the allotment of time for each question becomes more manageable.

The writer of the examination must at this point consider carefully how to present the questions, and in the case of questions such as multiple-choice questions, the answers. Which information is to be included in the Moodle quiz and what other information is to be include in the video portion in order to create a single, valid testing item? However the information may be divided, it should be in a way that the questions may not be completed without accessing both the video and the quiz itself.

It is beyond the scope of this paper to describe in detail the exact process of creating a Moodle quiz. There are many resources available elsewhere for that, including the documents contained in the Moodle organization's website (https://docs.moodle.org). Instead, this paper will provide a general overview which may also be applied to other online educational systems.

As those familiar with Moodle will know, it is usually most efficient to add the quiz questions into Moodle’s question bank either by uploading them through the GIFT format or through editing each individual question. Questions, along with the correct answers, are added to quizzes from the question bank. It is, of course, possible to also cut and paste the appropriate information into the video script and edit the remaining information in the quiz file for upload.

As noted in the section above describing the examinee's experience, one possible question type the students may be asked to answer would be a multiple choice type
question. How might the delivery of this question type be accomplished? The question is posed either aurally or visually or both in the video. The choices provided to answer the question may be shown only on the Moodle quiz screen, as multiple-choice questions are answered with a mouse click. In a case such as this, there is one technique which test writers may find useful. In Moodle a multiple-choice type question must have a question along with the answers in the Moodle system. In other words, it is necessary to fool the system into believing there is a question where, in fact, one does not exist. The question number as a kind of placeholder can adequately fill this role. True or false type questions can also be handled in the same manner as multiple-choice questions.

Another illustration of a question type could be a cloze question for a listening comprehension section. In this case, the question is posed with the sentence spoken in the video along with the sentence shown in the video, including a blank for the missing word to be tested for. The question in the quiz could be shown as an input space either preceding or following a cue such as, “What is the missing word?” For consistency, it is suggested that the question number, again be displayed in both the video and the quiz. Other fill-in-the-blank questions or short-answer questions can be handled in a similar fashion.

Questions using Moodle’s drag and drop question feature and matching questions could, as similar to above, pose the questions in the video while showing the answers in the Moodle quiz. It must be noted here, however, this kind of question would require the Moodle question screen to be visible while multiple questions are displayed in the video. As the timing of individual questions is manipulated through the video, this fact should pose little or no threat to the integrity of the quiz as a whole.

Once these questions have all be created, they can be added to the database and arranged to be displayed in the Moodle quiz as desired.

As indicated above, Moodle allows for making all quizzes accessible through a unique password for any individual quiz. This password can be added or changed at any stage of the quiz development and administration. If there are more than one group of students taking a quiz in succession, the password can be changed as soon as the first group begins the quiz to prevent subsequent groups from taking the quiz without the examiner’s knowledge or consent.

Moodle’s gradebook also contains information as to when any student began and ended a quiz as well as the time the student spent on the quiz. If any student has somehow achieved unauthorized access, Moodle will be able to provide evidence of the dubious access.

As Moodle allows for prepared materials to be hidden from the students to prevent access, the quiz can be prepared well in advance and tested thoroughly by the examiner.
Video design

There are two main elements to the video design which fall within the scope of this paper.

The first is the actual creation process of the video, which is fairly straightforward and familiar to almost any teacher who has used a presentation software.

The second part is the uploading and administration of the video on YouTube, a process with which not all may be familiar.

Many readers may assume that “video” in this paper means a recording using a video camera. This is not the intention here. The “video” discussed here refers to an animated presentation created with presentation software such as Apple’s Keynote or Microsoft’s PowerPoint.

As the process of creating videos with either of these is similar, for simplicity, this paper will describe the process of designing and creating the video using Keynote using the material described above.

Once the test material has been created, the content appropriate for the video can be transferred to the presentation file in order to create the video. Appropriate written information is included in each slide, which can include content, instructions, cues or question numbers. After all the slides in the presentation are completed, including an opening and concluding screen, attention can be given to the audio recording. Keynote allows presenters to make an audio recording for each slide in the presentation. After the audio plays, the presentation can be set to automatically advance to the next slide. The presenter can regulate the length of time of the recording in order to regulate the time each slide is shown in the video. If there is no audio for any particular slide, the transition to the next slide can also be regulated using the transition tool. These steps are standard in presentations. However, it is suggested that the teacher review the timing of the video as each slide is created. Keynote does not allow for the editing of audio for each individual slide. If a presentation has 15 slides, but there is a problem with the fifth slide, the audio will need to be rerecorded from the beginning of the fifth slide to the end of slide 15. Care exercised during the initial creation process can prevent wasted time and annoyance.

After all slides are created, recorded, and timed, the file can be exported as a movie and saved to the local computer. At this point, it is advised that the teacher again review the video. Once this process has been completed, the author has a video which can be uploaded to YouTube.

An account is required to upload videos to YouTube. After signing into the YouTube account, the option for creating videos becomes visible to the user. When the teacher clicks the video creation button, an upload screen then becomes available, allowing the teacher to drag and drop the video to upload it. After the selected video is uploaded,
it then must be converted to the format used by YouTube. Once the conversion is completed, three options become available to determine who has access to the video.

Just as access to the Moodle quiz can obviously be limited, access to the video by the students can be manipulated or controlled by the administering teacher through the YouTube account with which the videos are associated. There are three setting controlling access to videos. “Public” allows anyone to view the video, whereas “private” allows only the creator to see the video.

“Unlisted” requires viewers to have the specific URL to gain access to the video. The quiz administrator can provide the URL as described above just before the students attempt the quiz. The teacher can then make the video unavailable to students, or “private,” as soon as the test finishes.

It is worthwhile remembering that YouTube offers varying degrees of flexibility in providing video content to content producers. The default limit for YouTube videos as of the time of this writing was 15 minutes. A verified account will allow longer videos. The maximum size of files which can be uploaded is 128GB or 12 hours, whichever is less. (YouTube Help Center, 2020) As most tests or quizzes administered in a university environment are 90 minutes or less, this upper limit is more than sufficient.

When the video is uploaded, it can be reviewed again to ensure it proper integration with the Moodle quiz. If there are no problems, it is ready for use.

Cautions

It is worth being aware that there can always be something which goes wrong when technology is involved. Even quizzes produced on paper may result in the occasional misprint. Unsurprisingly, there is a higher probability of mishap when two technologies are coupled for simultaneous use. The teacher has to be prepared for any situation that befalls them. Fortunately, good preparation can often prevent small problems from becoming big ones. In this case, informing the students what to do if problems do arise is important.

There are two main sources of difficulty when administering a remote quiz as described above, namely, the teacher’s side and the examinee’s side.

If the test itself has been properly reviewed and tested, problems on the teacher’s side are likely to arise from improper settings limiting access to the quiz by the students. This can be relatively easily rectified by changing the settings. It is usually clear when such problems arise as it affects all students and not just individual students.

Problems affecting individual students may be more difficult to troubleshoot as they develop when the student is located remotely and, by default, the teacher cannot see directly what the problem may be.

Students may need to be made aware of their responsibility for ensuring their internet access is properly functioning and that they are responsible for their own
personal passwords. Students should also know that if a problem occurs for only themselves while other students are taking the test with no problems, the issue is with them and, again, they need to be responsible for their own electronic environment.

Students taught beforehand to describe problems or issues in detail and to describe the circumstances in which the issue occurs can provide much more assistance is solving any difficulties. "I can’t see the test” may be a complaint, but it fails to provide enough information to allow the teacher to address the issue. A description of what they can see provides much more information to the administering teacher and allows for a smoother solution to the problem. This is especially true when the problem arises on the examinee’s side of the quiz.

Conclusion

The COVID-19 pandemic has given rise to the need for remote education and has presented challenges to teachers both in terms of presenting educational materials and in assessment. One possible method of augmenting the accuracy of assessment is through limiting the students’ abilities to make use of outside materials during quizzes or tests. By combining two resources which the examinees must interpret to answer questions on a quiz or test, it may be possible achieve this goal. A set pace of a video combined with the limited total length of a timed quiz is one such example.

While this paper described one way to create these resources, there are other tools available which may be more familiar, hence more accessible, to the reader.

It is hoped that other effects not presently discussed may be examined in future studies to further appraise this method of assessment.

References

ストリーミングビデオとオンラインテストの組み合わせによる学習評価の強化

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新型コロナウイルスの影響で教育現場では様々な工夫が必要となった。本論文は、このような環境下にオンラインで小テストなどを実施する際の不正行為の防止および、公平性を高める方法を考察する。具体例として学生が利用できる時間帯の制限のために小テストの内容を分け、MoodleとYouTubeの同時操作による小テストの配信方法に焦点を当てる。このシステムは、さまざまな科目での適用が可能であり、基本原則を遵守することで、Google Classroom、Teams、Vimeoやその他のが教育ツールなど、動画共有ツールの利用により遠隔授業で実施する小テストにおける不正行為の減少も期待できる。