Turning passive watching to active learning:
Engaging online learners through interactive video assessment tools

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Abstract

Research in cognitive science has shown us that deep learning requires active knowledge construction; just passively watching videos will not lead to engagement in active learning. Using interactive video assessment tools enables instructors to rapidly create interactive video content and track students' participations, engagements, and even catch misconceptions through the viewing data. By surveying instructors and collecting students’ viewing data from Zaption in online courses, the features of Zaption along with its analytic tools were explored; and the implications for practice of interactive video tools have also been discussed in this study.

Introduction

Learning happens in a dynamic and creative process that involves learners' active knowledge construction. Learners feel connected when engaged in highly motivated activities and thus experienced the 'flow'. Over decades, instructors have tried to move away from the passive lecturing to more active learning practices (Giannakos, Krogstie, & Aalberg, 2016), especially for online education. The cost of time and money to create highly engaging content have been dramatically dropped by the invention of dynamic visual media, such as interactive video, hyper-video, and virtual reality. Studies of interactive video have been tested on the cognitive benefits (Schwan & Riempp, 2004); learning effectiveness (Zhang, Zhou, Briggs, & Nunamaker, 2006); students’ perceptions (O’Rourke, Western, & Main, 2014), and learning analytics for data mining purposes (Kleftodimos & Evangelidis, 2015). However, with limited resources and skill sets, many instructors still faced the challenges in creating interactive and engaging content for their online learners. Without an effective and engaging tool, online students have to replicate what they did in traditional classrooms, reading textbook chapters, watching narrated lecture recordings, and submitting assignments. It was difficult for instructors and instructional designers to track whether students really watched all course lectures, did they really understand the delivered content, and how reliable are the assessments. Although some learning management systems (LMSs) already have the built-in functions to track learner activities through viewing data, whether active learning occurred remains unknown.

The purpose of the study was to identify the major benefits, explore the features, and discuss the key challenges of using interactive video assessment tool in online learning, addressing the following research questions:

- What are the major benefits of using interactive video assessment tool in online learning?
- What are the key challenges in using interactive video assessment tool in online learning?

Zaption as the Interactive Video Assessment Tool in online learning

Zaption is an interactive video platform that allows video content uploaded to open video hosting sites such as YouTube, TED Talk, Vimeo, etc. to be embedded on Zaption's videos, and then engaging interactivities such as questions, discussion, images, or text, to be built on top of the videos. By integrating Zaption as the interactive video assessment tool into an online course, instructors and instructional designers can set the interactive questions within any video, and allows learners to view, re-view, skip forward, skip backward, and pause for questions. Students’ viewing and response data could also be collected for further analysis. The lecture video called “Tour” in Zaption can be easily created with limited technical skills, and video links can be generated and embedded into LMS for students to interact and learn from.

An attracting feature of using Zaption is its Analytic reports for evaluation. Zaption Analytic provides formative feedback that helps identify misconceptions in the early stage or areas that needs to be clarified for further instructions. Stigler, Geller, & Givvin proposed a Zaption Implementation Model in authentic educational settings.
including online courses in 2015. The implementation is guided by instructors' learning goals for students followed the circle of steps:

1. Instructor creates Tour
2. Students view and respond to Tour
3. Instructor views Analytics
4. Instructor leads follow-up activities
5. Instructor sets next learning goal

This model was implemented into our online courses with a modification: the instructional designers helped create Zaption Tours and shared permissions with the instructors for Analytic access.

Method

This study adopted a combination of a qualitative and quantitative research method to collect data from the participants. Two instructors and four students from a summer 2016 undergraduate online course, *Industrial Psychology* (3 credits), participated in the study. Interactive video content with embedded quiz questions was provided in each lecture presentation. A total of 64 videos were created during the late spring and early summer of 2016. At the conclusion of the course, two instructors were surveyed by questionnaires that designed by the instructional designers. Enrolled students’ viewing data were collected from Zaption Analytic reports.

Survey Instruments

The instructor survey was created using MS Word and delivered by email. The survey provided 6 Likert questions regarding to instructors’ knowledge and experience with Zaption, using the 5-point Likert Scale including “1” (Strongly disagree), “2” (Disagree), “3” (Neither agree nor disagree), “4” (Agree), to “5” (Strongly agree). Six open-ended questions regarding to instructors' perceptions of content presentation and analytic reports.

Students’ data were collected from their viewing data, included viewers by date, viewing time, question completion, average score, average skips forward, and average rating of each lesson.

Results

Zaption’s analytic tool provided three reports: Viewers, Responses, and Stats. The analytic reports can be exported as CSV and PDF formats. A total of 64 videos’ viewing data were collected with the three different views in Zaption:
Figure 1. Zaption screenshot: The Viewers tab

Figure 2. Zaption screenshot: The Responses tab
It is very helpful for instructors to see how many students watched modular videos every week, and the instructors could post announcements in LMS to remind students who haven’t watched. As one of the instructors reported:

“I’m noticing that some students don’t appear to be viewing the videos at all, others seem to be skipping through to the questions... but the Zaption data correlates perfectly with their exam grades... so although it's disappointing it's quite informative!”

Discussions

Although Zaption went away by September 30th, 2016, the features of it as interactive video did appear and continued as found in other alternative video tools. By examining users’ experiences of using Zaption in this online course, it provided evidences of the advantages of interactive videos in facilitating online learning, turning passive learning into active knowledge construction, and receiving learning data from learners which would be quite important for enhancing online courses. Those features and challenges exist not only in Zaption, but can also be generalized to a wider world, that is bringing more interactivity to online education.

Major benefits of using interactive video assessment tool in online learning

Benefit 1: Students were able to interact with lessons. The viewing data strongly suggested the embedded interactions of Zaption, such as open responses, numerical responses, multiple choice, check boxes, discussion, replay and jump, the participants were able to interact with lessons and course content.

Benefit 2: Students were able to use embedded questions to check understanding. Participants checked their understanding periodically by answering questions that set by the instructor at certain time points, and review video to prepare exams.

Benefit 3: Instructor was able to use Zaption Analytic to track students’ viewing data. The tracking feature of Zaption allows instructor to master each students’ progress of reviewing the lectures. For instance, when students were late of reviewing video lectures, instructors would be able to send friendly late reminder and announcements to students.

Benefit 4: Instructor was able to use Zaption Analytic to check students’ responses to questions. And modify questions as needed. The Zaption Analytic reports allowed instructors to compare students’ responses with...
their reflections of the entire course, relative feedback of discussion topics, and exam results, which helped instructors to adjust the questions, revise course content, and enhance the teaching and learning experience in the future time.

**Key challenges in using interactive video assessment tool in online learning**

Challenge 1: additional time and energy required for course preparation. Instructors indicated lacking time to create lessons in Zaption. Although Zaption offered step-by-step guides for beginners, it still costed instructor extra time and energy to design questions in addition to the preparation of the lecture.

Challenge 2: identify types of interactions for video lectures. Instructors struggled with the proper interactivity for each question in Zaption. The most chosen type of interaction was multiple choice, followed by true and false type. Although Zaption offered other options, such as open responses, numerical responses, check boxes, discussion, replay, and jump, instructors had very limited attempts on using them.

Challenge 3: challenge of technology skills. Instructors indicated not having strong technical skills to create lessons in Zaption. Without the assistance of instructional designers, instructors felt difficult to insert questions in Zaption, and needed support in embedding the created Zaption lesson within LMS.

Challenge 4: alternative tool needed for replacement of Zaption. With Zaption went away, more time was spent on downloading analytic data and re-creating lessons using Office Mix. It happens quite often in online education that a certain tool becomes no longer available and the instructors and instructional designers need to search for alternatives. The biggest issue is to find the solution to retain the analytic data from Zaption. Office Mix was the one that served as emergency measure.

**Limitations**

There are some limitations of this study. First, since this online course was offered first time online, the very low enrollment resulted in a lower response rate of the study, which made it difficult for collecting students’ self-report data for analysis. One other unexpected limitation was Zaption went away by the end of September 2016; we were unable to provide implications of practice in this study.

**Conclusion**

Our research showed that interactive video lecture as an assessment tool helped instructors to track students’ viewing data in order to master each students’ progress of reviewing the lectures, to use analytical data modifying questions as needed, and to turn passive learning into active engagement.

**Reference**


