Exam Preparation through Directed Video Blogging and Electronically-Mediated Realtime Classroom Interaction

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Abstract

A structured approach to video blogging ("vlogging") has been piloted at the University of Central Florida (UCF) as a pedagogical tool to increase engagement in large-enrollment undergraduate courses. This two-phased activity enables a "risk-free" approach of increasing participation from all students enrolled in the course, as well as the opportunity for students who volunteer to advance their technical exposition soft-skills through professional video composition. A review of subject matter content without requiring the viewing of an excessive quantity of vlogs along with a rubric supporting automated grading mechanisms in real-time are some of the objectives that will be met through the implementation of this pedagogical tool. The resulting Learner Video Thumbnailing (LVT) hybrid individual/group exercise offers a highly-engaging interactive means for all students to review course topics in preparation for larger objective formative assessments.

Keywords

Formative Assessment, Cyberlearning, Student Engagement, vlog, YouTube

Introduction

Video Blog postings, also known as *vlogs* in a shared online environment can facilitate learners' reflective thinking[1]. In addition, it can provide a medium to express the students' understanding, triggering a meaning-making process thereby making it a significant aspect of formative assessment in online higher education[1, 4, 5, 6, 7]. A vlog can be defined as a blog in which the postings are in video format[2]. The goal here is to implement vlogging as an extra credit activity while ensuring it to be a risk-free prospect of expression of the subject matter for the corresponding course. Through this paper, we will discuss the techniques, platforms and rubrics supported by a quantitative/qualitative evidence, bearing in mind some strengths of this approach compared to the existing pedagogies. The vlogger/spectator hybrid individual/group exercise offers a highly-engaging interactive means for all students to review course topics in preparation for larger objective formative assessments. In the vlogger/spectator method called Learner Video Thumbnailing (LVT), Vloggers volunteer compose their own videos that are two minutes in duration about a schematic or artifact covered in the course. Spectators attending class would watch the videos together as a classroom activity. Thus, the spectators earn credit for correct responses to technical questions on topics from each vlog. Meanwhile, the Vlogger earns extra credit for making a creative brief technical video clip using their own YouTube account.

Over the last decade, there has been a significant shift from conventional learning methodologies and assessments to e-learning and e-assessment, with the motivation that e-learning can combine technology and learning in the online medium[1, 3, 5, 6, 7]. Web-based sharing sites allow learners to participate, as well as respond to prominent reusable course related content[3].

Web-based video is defined as the video that is accessed online via Internet and can be viewed on any web browser or can be downloaded[4]. This can be readily achieved using the abundantly available video-sharing sites such as YouTube[2]. In general, sites such as YouTube are already popular with students to access professionally-prepared content[4] such as Khan Academy and TED Talks. In essence, these resources are considered highly valuable to both, the learner and the instructor as they possess an enormous content repository that can be tapped into for educational purposes[4]. For our study, we have chosen YouTube which allows registered users to upload videos and unregistered users can view this content for free with just the ability to connect to the internet on their digital device[7]. This alleviates the logistic burden to the teaching institution and/or faculty to maintain individual user accounts, storage base, and video player software.

Video Blogging ("vlogging")

Video is mainly used as a powerful narrative media that can help facilitate student learning[2]. For instance, vloggers may post a response through short videos, a critique of ideas, suggestions, and the like, which is a defining characteristic of a blog[2]. Typically, vlog is a blog that employs video as the primary content and combines this with supporting text, images, and other metadata[2]. The making of a vlog can be structured into creation, sharing and documentation. A vlog can be created entirely by the user and there are a variety of tools and software that provide step by step instructions on how to edit and create vlogs. This provides students with an opportunity to learn in creative methods and demonstrate how resourceful they can be. Sharing the vlog is rather straightforward and comprises of a few quick steps that can be implemented. Once the vlog has been shared, it will be made available depending upon its date of posting and its content allowing it to be accessed online at any point in time.

Vlogs can be relatively short in duration, and in the context of this paper are three to five minutes in length. They comprise of user content in an orally narrated format supported by animated visuals which are universally enjoyed and readily assimilated. Sharing vlogs on sites such as YouTube provide the advantage of a portable video format using flash plugins along with readily accessible and searchable since the videos as organized in a chronologically-indexed or content-indexed sequence. In terms of devices that can access these vlogs, any WiFi enabled device that can connect to the internet will allow access, be it a desktop or a mobile device and since the formats are simple formats, the user's software environment does not pose an issue.

Related Works

In this paper, other methods which have utilized web-based video learning and vlogs as a resource to elevate quality of education have been described and compared to the method proposed in this article. In a recent article by Chareen Snelson[4], an overview of considerations

with use of videos in education are presented. Web-based video libraries span all of the video content available through various sharing sites on the internet. Although video sharing sites have gained popularity, in education, locating the relevant topics poses an immense filtering issue. Also, a vital observation has been made that educational institutions are shifting towards utilizing popular web based video sharing sites in education for online discussions, video case analysis, virtual field trips, and WebQuests[4, 8], as they can benefit from the minimization of monetary investment.

In a discussion on using online shared video media and blogging, Olofsson et al.[5] have attempted to provide a learning and meaning-making process to students. Using VoiceThreads[5], that are a combination of video blogs and supporting comments, students are encouraged to participate in innovative methods of learning. Through this study it has been speculated that video blogging has changed the dynamic of learning as it provides a medium for the students to express their understanding of the content. Also, the review and discussions that follow a VoiceThread direct the students towards reflective thinking thus opening opportunities for understanding of concepts. The association between the use of web technology in education and students' performance has favorably assessed by the proposed the framework.

In another study Paul Anderson[6], has discussed the emerging Web 2.0 technology and its applications as well as services for education. Web 2.0 is the collaboration of multiple web services such as blogs, wikis, Multimedia sharing, audio blogging and podcasting as well as RSS syndication. Through this study, a combination of the aforementioned services that rely on participation of masses or social networking. On the larger scale the objectives of this technology is to allow user generated content to a large extent, harness the strength of a crowd and provide data on an large scale. In education, this technology focuses on a more open and personalized method of learning. Although wikis and blogs have known to be particularly useful in developing creativity of the students in learning, restricting access still remains an issue in terms of production and authentication of knowledge. In addition to this, issues of privacy, plagiarism as well as shared authorships have also known to exist.

LVT Method

We have introduced a novel method called Learner Video Thumbnailing (LVT) in which each participating student summarizes the materials covered in the class in his/her own words and prepares a vlog which helps the students study better for exam as well as receiving extra credit. Table 1 lists different methods with their attributes indicating that LVT offers a promising tool to improve learning. Namely, participation is voluntary and evaluation does not involve peer review.

Table 1: Related works.

Approach	Medium	Participation	Activity	Review	Device & Access
Web Based Video-in Education[4]	Multiple mediums: wiki/Blinx	Compulsory	Individual	E-Assessment and Peer Reviews	Internet enabled device, Individual access
Shared video media and blogging online[5]	VoiceThread	Compulsory	Individual	Online Assessment and Peer Reviews	Internet enabled device
Web 2.0[6]	Custom medium	Compulsory	Individual and Personalized	E-Assessment and Peer Reviews	Internet enabled device, Individual access
Learner Video Thumbnailing (LVT)	*YouTube*	*Voluntary*	*Hybridized as Individually Conducted with In-Class Component*	*Panel with Spectator "Top Vlog" or Technical Question*	*Any WiFi enabled device, live access*

By definition, a *thumbnail* is a very small or concise description, representation, or summary. In the LVT method, since this summary is being captured as a video by the student, we have chosen the name Learner Video Thumbnailing (LVT). In this method, the volunteer student can be either a *vlogger* or a *spectator*. Interested potential vloggers sign up to vlog using a single-question quiz accessible via the course Learning Management System (LMS) depicted in Figure 1. Vloggers are selected randomly among those who have responded favorably to the quiz. Selected vlogger uploads his/her own original YouTube video (2 minutes +/- 30 seconds) to their own personal YouTube account.

Figure 1: Adapting LMS-based quiz for vlogger sign-up.

Sample vlogger signup screens are shown in Figure 2. As depicted, the idea behind LVT is to provide a single still image archetype for the technical content covered in the material to appear on the upcoming formative assessment. This invites creativity by allowing great latitude in the students' submissions while challenging them to recall what was covered that relates to the archetype image. Thus, vlogs cover the targeted course materials and topics covered in class. Samples screenshots submitted in response to these archetypes are shown in Figure 3 vloggers are allowed to use self-written notes and internet resources as well as class resources to prepare the vlog. The vlog should be in their own style, however, there are standards established to enforce professionalism including non-derogatory statements and citation of sources. If the vlog published by the vlogger has the requirements based on the rubric described in the following sections, vlogger will receive extra credit. Recorded vlogs should demonstrate sufficient coverage of topics, technical correctness, appropriate visual aids and style. All students enrolled in the course are eligible to participate as spectators who will watch the vlogs and answer multiple choice questions using a quiz via the LMS which will be explained later in this section. In particular, the authors utilized the existing campus WiFi network along with the students WiFi-enabled devices to deliver the spectator quiz during class in real-time.
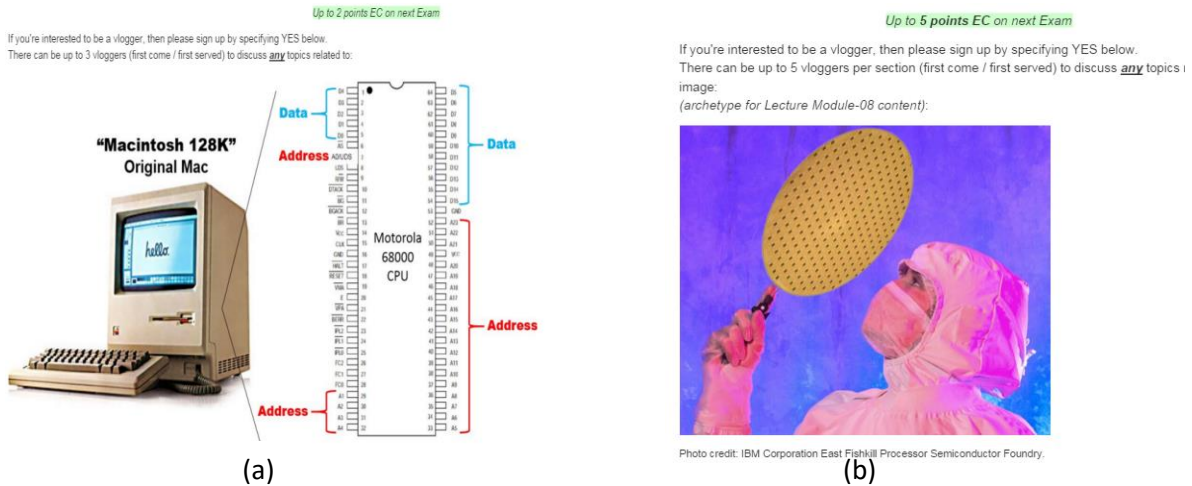

(a)   (b)

Figure 2: Vlogger signup for (a) Module-02 on CPU Bus Design,
and (b) Module-08 on Device Technology.

(a)   (b)
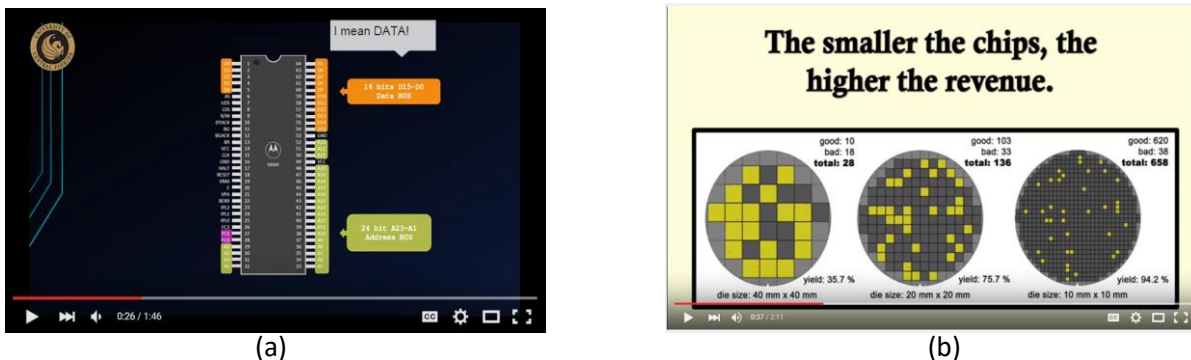
Figure 3: Student vlogs submitted in response to signups in Figure 3(a) and 3(b), respectively.

A. Panel Perception Spectator Evaluation Method

The panel consists of the Instructor and the Teaching Assistants (TAs) and Graders responsible for the course. When a vlog has been submitted for preview, panel members watch the video and grade it based on the rubric provided in Table 2. As established by the rubric, several characteristics are required in order to receive full extra credit for the spectators.

Each vlogger will earn credit solely by composing the vlog, regardless of how other classmates consider the submission. Hence, vloggers always earn their full Extra Credit, as long as they follow the rules, and grading of the vlogs are not based on peer reviews. Also no one is obligated to compose a vlog if they are uninterested to participate as it is voluntarily. This will resolve the issue mentioned in the article below:

> "I would feel embarrassed about sharing my video. We don't let other students just out written essays in public forums, why should they now be able to judge not only the quality of our assessment, but also our appearance. In this instance public judgement whether good or bad is not necessary because we are not singers, musicians etc. our work is not aimed at public enjoyment"[9]

Table 2: Rubric for evaluating the panel's perceptions.

	Use of Medium
5 (Expert)	The Vlog is Professionally Prepared utilizing the medium with Appropriate Visual Aids. Video and text are used as required.
4 (Advanced)	The Vlog is somewhat Professionally Prepared utilizing the medium. Video and text are used as required.
3 (Intermediate)	The Vlog is well Prepared utilizing the medium. Video and text are used almost as required.
2 (Basic)	The Vlog is not well Prepared utilizing the medium. Video and text are not used as required.
1 (Unsatisfactory)	The Vlog is not good enough and utilization of Visual Aids medium is not appropriate. Video and text are not used as required.
	Content
5 (Expert)	The Vlog is creative, in-depth and insightful. Sufficiently Covers all the topics and is Technically Correct
4 (Advanced)	The Vlog is mostly creative, in-depth and insightful. Sufficiently Covers all the topics and is Technically Correct
3 (Intermediate)	The Vlog is mostly creative, in-depth and insightful. Technically Correct, however, does not Sufficiently Cover all the topics
2 (Basic)	The Vlog is somewhat creative, in-depth and is somewhat insightful. However, Technically it is partially incorrect, and does not Sufficiently Cover all the topics
1 (Unsatisfactory)	The Vlog is not creative, in-depth and is not insightful. And technically it is partially incorrect, and does not Sufficiently Cover all the topics

In our method we have eliminated the peer review process by setting separate scores for vloggers and spectators. This idea have shown an engaging participation of 100% of students.

B. Vlogger Perception Spectator Evaluation Method

Based on the studies mentioned in the literature, it has been demonstrated that students show enthusiasm participating in these types of visually-appealing interactive assignments. Since we are utilizing this method as an extra credit activity, it has been observed that students become increasingly eager to participate. Utilizing this method, we have received numerous emails from students participating in this method who they were thankful for this learning opportunity. They were willing to provide their composed vlogs including higher quality archival versions for use in future semesters of the course. Spectators also displayed interest and enthusiasm participating in this engaging activity as well. They only have to watch closely and answer to some questions to receive extra credit. In summary, directions and steps for preparation of the vlog are listed in Table 3.

C. Realization within the LMS

The two methods identified above have been piloted in the Canvas LMS as discussed below. We have implemented both methods and provide the results in the results section.

C.1) Panel Based Assessment

First method requires the spectators to respond to general questions based on the quality, content coverage, and visual aids utilized in the vlog. Then spectators' answers will be scored based on the rubric table. First, the panel ranks the submitted vlogs. Second, the spectators attempt to match the panel's ranking in order to receive extra credit.

C.2) Technical Content Based Assessment

The second method requires the spectators to answer technical questions regarding the content of the vlogs shown during class. Here, the panel first views all the vlogs and then prepares at least one question based on each vlog for the TA to include in the extra credit quiz in the LMS to be answered by the spectators. In this method we can also include partial extra credit

Table 3: Preparation guidance provided to vloggers via the sign-up quiz.

Steps	Preparation Direction and Hints
1	Google a few keywords related to a picture which is related to course topics in order to locate some Visual Aides
2	If vloggers want to make more technical vlogs including lots of details they can use some of the course materials or other resources available on the web
3	The vlog production process from start to finish can take 30 minutes or less. There is no need to spend more than an hour to prepare the vlog, however, making the vlog is also studying course materials which can be helpful for the vlogger in order to prepare for an upcoming Quiz/Exam/Etc.
4	Vloggers are allowed to use their sense of humor and have some fun parts in their vlog which will make this with this method an interesting interactive way to prepare for an upcoming Quiz/Exam/Etc.

since the questions can have multiple answers. Technical questions are randomly-selected by the Learning Management System (LMS).

Results

We have integrated LVT into an undergraduate course called Computer Organization and Design and based on the results described below we can prove that LVT method can play a major role in the classroom for formative assessment preparation.

A. Result for Panel Perceptions compared to Spectator Perceptions

Based on our preliminary results, students were highly-engaged in the Panel Perception Spectator Evaluation Method of LVT. During the initial release of the LVT method, two extra credit points were offered to vloggers and one extra credit point was offered to spectators. In hindsight, there were only two vloggers interested in composing a vlog which used the Panel Based Assessment approach. The panel selected the first vlog referred to as Vlog A was designated as the leading vlog for Professional Preparation, Topic Coverage, Technical Correctness, and Visual Aides based on the rubric in Table 2. Spectators had the opportunity during the class to participate in an optional extra credit quiz delivered by the LMS whereby they could indicate which vlog they believed to be panel's choice as the top vlog in order that they receive extra credit. As mentioned earlier, vloggers received 2 extra credit points for composing their vlog. The results for 101 spectators participating in this method shows that 75% of the spectators' choice matched with the panel's choice which was Vlog A. Meanwhile, 47% of the spectators believed that the second vlog referred to as Vlog B will have the most views after 1-year on YouTube. On average the amount of extra credit earned by spectators was 1.75 points towards the upcoming exam, i.e. the formative assessment to which LVT was being applied.

Figure 4: Adapting LMS-based quiz for spectator participation to realize real-time classroom interaction.

Figure 4 depicts the extra credit quiz for the Panel Perception Spectator Evaluation Method of LVT.

B. Result for Vlogger Perception Spectator Evaluation Method

To evaluate the impact of increment in incentive, the extra credit points for vlog submission were increased from two points to five points. The number of responses increased to eight within a short span in the Vlogger Perception Spectator Evaluation Method. This substantiates the need to provide incentive commensurate with students' expectations for extra credit. All eight students completed preparation and submission of their vlogs, providing the link so that the panel can make an extra credit quiz containing technical questions for spectators. This time the LMS-delivered quiz also included partial credit. A sample result of extra credit quiz for the Vlogger Perception Spectator Evaluation Method is shown in Figure 5. Based on the eight vlogs and 69
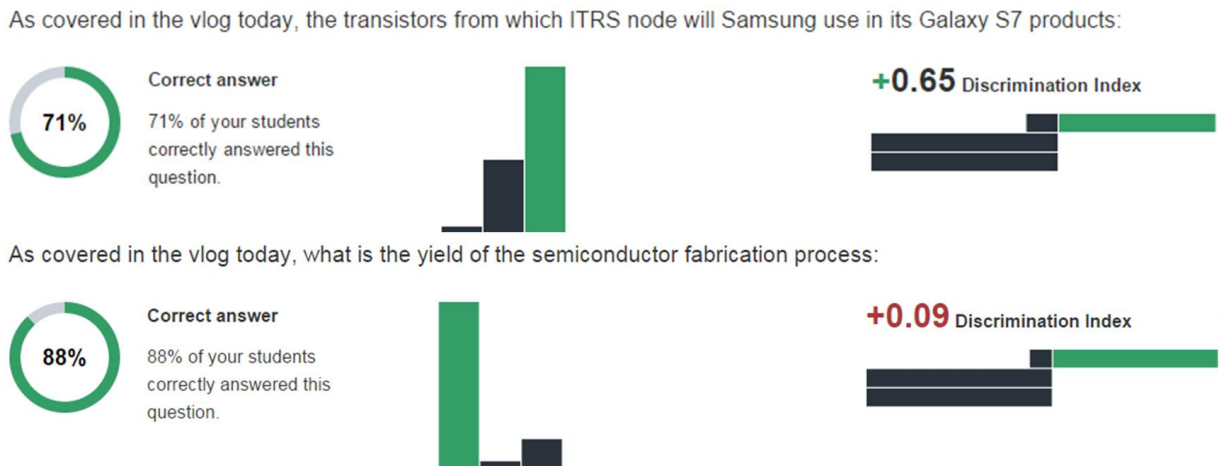

Figure 5: Sample quiz statistics for spectators responding to technical questions asked which realized real-time classroom interaction.

Table 4: Technical questions for vlogs watched during Fall 2015 semester which received 148 spectators' responses.

Question Asked	Number of Spectators Responding	Number of Correct Answers
As covered in the vlog today, which of the following elements of the periodic table is considered to be a semiconductors?	17	17 (100%)
As covered in the vlog today, what year was the transistor invented by Shockley?	35	35 (100%)
As covered in the vlog today, which of the following processors is popular for IoT devices?	24	18 (75%)
As covered in the vlog today, the correct pronunciation of first output of the molten silicon process is:	11	9 (82%)
As covered in the vlog today, what is the yield of the semiconductor fabrication process?	17	15 (88%)
"Chip binning" which leads to the so-called "silicon lottery," involves:	16	1 (6%)
As covered in the vlog today, the transistors from which ITRS node will Samsung use in its Galaxy S7 products?	14	10 (71%)
As covered in the vlog today, how many layers of photolithographic processing are required for a typical CPU wafer producing a high end CPU? Please indicate the closest value listed below:	14	6 (43%)

spectators' answers below results were achieved as listed in Table 4. The change in the number of spectators appeared to be precipitated by activities occurring during that same week such as exams in other courses.

Conclusion

The LVT hybrid individual/group exercise offers a highly interactive means for all students to review course topics in preparation for larger objective formative assessments. Through this activity each participating student interprets the video content covered in the class to either match the panel or respond to the technical content questions. Preparation and viewing of vlogs encourages all students to prepare for formative assessments while receiving extra credit points. Vloggers are encouraged to demonstrate sufficient coverage of all topics, technical correctness, appropriate visual aids and style. Spectators consist of remaining students enrolled in the class who will view the vlog and will respond using an LMS based quiz. This method has eliminated the peer review process and it associated perils.

Students appreciated the opportunity to express their creativity and responded by creating visually appealing interactive assignments. To accommodate the preferences of each learner, students are also provided an opportunity to participate as a spectator. We are encouraged by the preliminary results using this creative, yet structured approach for increasing engagement in exam preparation. Additionally, the vlogging undergraduates obtain a discussion-inspiring resume item to include mentioning on resumes as a creative derivative work.

Acknowledgements

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