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Web Video Project as an Instructional Strategy in Teacher Education

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Abstract: The advent of Web 2.0 has metamorphosed the landscape of the Internet from a static "depository" of multimedia data into a dynamic and participatory "habitat" of individuals. Web video, epitomized by YouTube, is particularly suited to student-centered design of learning where students make their own choice of video they want to use to enhance their learning. User-generated web video can be created and shared freely and openly over the Internet by anyone and its value lies in its content and the way it is authored rather than in its delivery method or the media player used to display it over the web. This paper discusses the qualities of this emerging type of Web video, offers a conceptual framework for the integration of user-generated Web video into student learning, and shares practical experience of Web video application in the teacher education curriculum in a regional university in Alabama.

Setting the Context

With the spread of broadband Internet access, the use of streaming video has grown rapidly in the field of teacher education. One of its key advantages is that it is accessible to students anywhere, whether on campus or not, and opens up new possibilities for their learning. User-generated Web videos, along with video sharing websites, have been widely adopted by mainstream education. This emerging type of video – best epitomized by the popular website YouTube – presents a new way to represent knowledge that lies in the de-centralized production of video narrative and the way this narrative is authored by embedding the ideas of bottom-up collaboration, user-generated content, and community building. YouTube is the fourth most visited website in both Canada and the United States, and the third globally (Alexa Internet, 2010). Teacher education cannot disregard the potential of Web video to influence the way students acquire knowledge and negotiate its meaning. Web video can only be effective if the educational goals are clearly defined in terms of its application to the learning process. In this regard, teacher candidates are urged to revisit their teaching and learning philosophies regarding the nature of knowledge and how knowledge is created within the learning process (Dede, 2008).

Current research has demonstrated that university students highly appreciate and take advantage of video content streamed over the Web, as it allows for greater flexibility in studying the subject matter compared to video content delivered via CD-ROM (Bracher, Collier, Ottewill, & Shephard, 2005; Wu & Kao, 2008) or lecture content presented in a classroom (Bassili, 2008). Other findings (Leijen, Lam, Wildschut, Simons, & Admiraal, 2009; Wu & Kao, 2008) imply that streaming video supports students in taking a more active role in the evaluation of their own learning performance or that of their peers. A shortcoming of these studies is that most researchers investigate streaming video produced by universities (Bracher et al., 2005), faculty members (Bassili, 2008), or media production companies. Despite a high level of content reliability and academic rigor, these videos are seen as a form of authorized discourse, often stripped of situational contexts and, sometimes, give a one-sided and/or outdated account of the subject matter students explore. The reliability of video content is contingent on the knowledge and experience of particular individuals (e.g., instructors, experts) whose expertise is based on "what they have learned from reading and thinking, from listening to and observing others, and from their own experience" (Fraenkel & Wallen, 2003, p. 5). Moreover, the choice of video is often prescribed by course instructors, rather than students. All these aspects of the production and use of streaming video suggest that producers and instructors "clear a path" to knowledge by determining which information is included or disregarded in the video segment, as well as which part of the video is relevant to be integrated into the curriculum. In this regard, students are exposed to the video that represents "filtered" information and favors only one side of a matter or a problem.

The instructional strategy discussed in this paper focuses on user-generated Web video and video sharing websites which provide students with a broader sampling of video episodes that help them explore a complex concept. In particular, by browsing the volumes of Web video on video sharing websites, such as YouTube, students are able to view multiple and diverse perspectives on the same topic which provides the potential to advance their

understanding about the subject matter and to further their breadth and depths of knowledge in the discipline. In this paper, we intend to share our experience of utilizing Web video in the teacher education curriculum while applying the principles of situated and distributed cognition theories. This is an aspect of e-learning and digital pedagogy that has received little attention in the extant teacher education literature.

Web Video and Its Benefits for Student Learning

The advent of Web 2.0 has metamorphosed the landscape of the Internet from a static "depository" of multimedia data into a dynamic and participatory "habitat" of individuals. Under an umbrella of Web 2.0, a number of applications and online services have appeared. These Web 2.0 applications hold promising possibilities for "bottom-up" interactivity and collaboration while producing, organizing, re-using, capturing, storing, or indexing a wide range of multimodal content that is open and accessible to anyone connected to the Internet (Bonk, 2008; Caladine, 2008; Dede, 2008; Richardson, 2006). In line with these new capabilities afforded by the Web, the launch of YouTube in 2005 with its "broadcast yourself" motto has become an important milestone in the evolution of video technology. The YouTube platform and its combination with wireless mobile devices, video annotations (i.e., interactive commentaries), screencasting software (i.e., devices used to record activities on the computer screen for demonstration and training purposes), video capture applications, and video editing software (i.e., devices used to capture existing video and recombine it with original material to produce a new value-added video) have transformed the essence of streaming video.

In this paper, we use the term *user-generated Web video*, or just *Web video*, in preference to online streaming video. The underlying logic upon which the term user-generated Web video is used arises from the user-generated concept of social media that re-conceptualizes the production of digital content and redefines the functions of producers and viewers of digital content. Web video can be created and shared freely and openly over the Internet by anyone. In contrast, the value attached to professional or commercial streaming videos is embedded with the authority of the producer (e.g., university, instructor, or mass media industry), who filters to some extent the content of information, script, and footage. Web 2.0 applications "may destabilize the structures that filter information flow and knowledge construction on the Internet" (Macfadyen, 2006, p. 288). Therefore, Web video can be characterized as an Internet-based user- or community-generated video, as second generation of online streaming video, or as a mainstream (i.e., open, free) online video on demand. In other words, the value of Web video lies in its content and the way it is authored rather than in its delivery method or the media player used to display it over the web.

Web videos are uploaded, shared, and viewed within video sharing websites, such as YouTube, TeacherTube, ForaTV, ScieVee, and others, where individuals can interact with others and discover videos on the basis of their common interests, and can communicate with each other through vlogs or vidcasting (i.e., video blogs) and "broadcast themselves" (Burke & Snyder, 2008; Trier, 2007). Web video is thus often described as "collective intelligence" which contains "the aggregate knowledge that emerges from the decentralized choices and judgments of groups of independent participants" (Tapscott & Williams, 2006, p. 41). The associative organization of videos (through the use of tags, search, related videos, and the like) in video-sharing networks is similar to that of human memory, and information retrieval from the video sharing networks reveals similarities to human cognitive abilities (Kulkarni, 2007).

Because of the possibility of personalization Web video can encourage and facilitate learner's active engagement in critical viewing or authoring content in the forms of vlogs (Ullrich, Borau, Luo, Tan, Shen, & Shen, 2008). Through collaborative filtering (e.g., use of related video) predicated on the viewing habits of "the crowd," video sharing websites make immediate suggestions on other videos relevant to the student's initial search (Ullrich et al., 2008). Thus, it opens up opportunities for personalization (Bonk, 2008) and customization during a student's knowledge construction and learning.

Wireless mobile devices, such as smart phones or tablet computers, in combination with Web video sharing websites, microblogging, and social networks, accelerate potential approaches to engaging students in creating immediate digital video content. With a mobile device in hand, learners can record authentic practice that takes place in a real-life context and then share, with minimal technical difficulty, the video segment with others by uploading it to any video sharing environment (Ullrich et al., 2008).

The use of Web video provides access to the diversity and multivoicedness of knowledge and its meaning. It allows students to observe and reflect on real-world content, produced by real people in authentic situations and representing different viewpoints and meanings in understanding various aspects of the topic they study (Caladine, 2008; Ullrich et al., 2008). According to Bonk (2008), Web videos help students understand complex concepts (e.g., artificial intelligence or behaviorism) and heighten their curiosity about aspects of the subject matter by providing valuable ideas and insights.

Web video offers great potential to creative and artistic learning because of its enormous possibilities for remixing and transforming multimodal content. Easy-to-use and lightweight formats of Web video create a potential not only for embedding them into other websites outside the video sharing social network (e.g., blogs, wiki, Facebook, etc.) (Burke & Snyder, 2008), but also for creating conditions for higher level usage, such as mash-ups or remixing of various videos, audio, screencast, and other modes of representation for the purpose of creating a new digital composition (Bishop, 2009; Ullrich et al., 2008).

Clearly, Web video bears potential to be integrated into the learning process in higher education. It is particularly suited to student-centered design of learning where students make a choice of what video they need to watch to support their learning. In a video sharing network, students are able not only to view a broad sample of user-created content, but they are also provided with the opportunity to interact with creators of video and other members of the network and to share their own video content with a broader audience.

Theoretical Foundation

With the emergence of "participatory web" technologies, educators and scholars have begun to re-think what it means to learn in this kind of world. Our pedagogical model for infusing Web video into teaching and learning is largely informed by the theories of situated cognition and distributed cognition.

A situated cognition theory highlights two categorizations of the learning process relevant to this research – context-driven knowledge and authentic experience. Proponents of situated cognition argue that knowledge is dynamic, contextually situated, and the understanding of its meaning is continuously constructed through its application to new situations (Brown, Collins, & Duguid, 1989). Observation of knowledge in a context and participation in authentic settings help students construct useful knowledge and make sense of expert's experience embedded in authentic practice (Brown et al., 1989; Barab & Duffy, 2000). In addition, knowledge construction is highly contingent on "contextual noise" (i.e., situated meanings and tacit knowledge), embedded or "hidden" in the fabrics of the authentic discourse and cannot be explicated fully (Brown et al., 1989; Bereiter, 1997; Lave, 1991). In contrast, students' interaction with decontextualized knowledge, such as textbook examples, descriptive explanations, and other abstract representations inherent in classroom discourse, leads to the development of misconceptions of domain knowledge and weak relations between what is taught and the life-world experience (Brown et al., 1989; Lave, 1990).

A distributed cognition theory posits that learning is enabled by students and their cognitive skills and takes place through collaborative activities, where multiple students participate, interact, and share their knowledge and experience (Cole & Engeström, 1993; Pea, 1997; Salomon, 1994). While participating in a learning activity, students' engagement is mediated by artifacts (e.g., tools or symbolic representations), regulations and procedures governing their interaction, and by a "division of labor" intended to assign tasks and roles to the students (Cole & Engeström, 1993). Knowledge, therefore, is embedded in the activity and the dynamics of interaction, rather than in students' minds, communities, or objects. The pedagogical goal of a distributed cognition framework is to shift learning by rearranging knowledge construction from an isolated (i.e., tool-free) and self-directed activity to "facilitating individuals' responsive and novel uses of resources for creative and intelligent activity alone and in collaboration" (Pea, 1997, p. 81).

The pedagogical model utilized in this study infuses Web video into student learning and is based upon situated cognition and distributed cognition theories. The situated perspective assumes that information cannot be consumed and converted into knowledge in isolation. In our instructional design of the video project, situatedness

was fostered by the creation of videos representing the emergent and fluid concept of individual student's knowledge, as well as his or her desire for freedom to deliver the authentic message directly to the public without formal approval mechanisms. In this regards, it bears the potential to challenge students' thinking, for instance, while evaluating video content from a critical vantage point. The theory of distributed cognition views learning as an interaction between students and video that carries the intelligence of the producer and has the capacity for facilitating deep and reflective understanding. In our project, the validity and relevance of the video content created by students was evaluated through "collaborative filtering," in the forms of peers' commentaries, ratings, and the number of views.

Model for Infusing Web Video into Student Learning

Web 2.0 developments provide today's students with more opportunities to enhance their learning, including interaction, knowledge creation, and cultivation of innovative thinking and higher-order cogitative skills. With the increased popularity of the "participatory web" and its tools in education, researchers have argued widely over the paradigm shift occurring in the learning process which entails significant changes in the different areas of learning, such as the development of shared, bottom-up, and context-dependent knowledge, adoption of active learning strategies, and the emergence of collective intelligence (Dede, 2008; Tapscott & Williams, 2006).

Drawing on the discussion of situated cognition and distributed cognition theories, as well as the findings of current studies on the impact of streaming video, we have developed a conceptual model which provides a methodology for incorporating Web video into student learning. This "Learning with Web Video" model, LWV model in short, is grounded on the following premises informed by the constructivist school of thought and theories of situated and distributed cognition:

- Learning is an active and ongoing process of constructing knowledge and new understandings, developing skills of reasoning and of learning, and shaping attitudes, including beliefs and values.
- Knowledge construction is an emergent "bottom-up" process supported by situational activities, collaboration, and exposure to multiple perspectives.
- Knowledge and thinking is distributed physically, socially, and symbolically (i.e., across the minds, media, artifacts, groups of individuals, and space and time).
- Learners take active part in validating their knowledge construction and evaluating their learning performance.

In the context of the LWV model, Web video is brought to provide situatedness and multiple perspectives to the learning process occurring either at home while preparing an assignment or in the classroom while engaging in small group discussions. However, it is the influence of Web video on the practice of student learning that is of interest. Web video is characterized as a learning means for knowledge construction and gaining new understandings. Students, through the use of Web video, observe diverse and decentralized viewpoints on the subject matter studied and develop new understanding of knowledge by establishing relationships between their prior knowledge and experience, "authoritative" knowledge prescribed by the instructor through a syllabus, and the "contextualized" (i.e., observed, emergent, or bottom-up) knowledge inherent in Web videos.

The key instructional components of the LWV model are as follows:

- *Self-directed knowledge building* is predicated on the coordination of three sources of knowledge: (a) "authoritative" knowledge (e.g., scholarly articles, textbook chapters, and instructor's expertise); (b) "contextualized" knowledge (e.g., authentic practices or others' perceptions and understandings embedded in Web videos); and (c) learner's existing knowledge and prior experiences. At this stage, learners make their own choice of relevant Web videos that will help them gain an understanding of "authoritative" knowledge. In personal reflective conversations with themselves, learners establish connections between "authoritative" knowledge, "contextualized" knowledge, and their prior knowledge resulting in building new or modified constructs of their own knowledge (i.e., self-directed knowledge building).

- *Collaborative knowledge building* is carried out through active engagement in small group discussions and presentations of group's collective intelligence in the classroom and constructive peer commentaries to learner's weblog entries or learner's own video clips.
- *Production of Digital Video* by learners, either individually or in small groups, as the contribution to the collective accumulation of knowledge on the Web.
- *Self-evaluation* and peer assessment are essential in assessing learning performance. Evaluation criteria for learning activities, co-developed with learners, are devoted to enable students to carry a holistic analysis of their learning performance, knowledge construction, and thinking processes. Self-evaluation and peer assessment give students an opportunity to reflect on the processes of learning and analyze the changes in the state of their approaches to learning (metacognition) and their understanding of knowledge.

The process of incorporating Web videos into academic discourse and student learning has two significant functions. First, it has the capacity of situating student knowledge construction within a broader contextual environment embedding authentic cultural and social situations. Secondly, Web video sharing networks, such as YouTube, TeacherTube, TED.com, or Fora.tv, "distribute" various artifacts of collective intelligence which have been created based on other individuals' conceptions of the world and their cultural experiences. That being said, Web videos can be viewed as supplemental learning resources which expose learners to a multiplicity of diverse perspectives and multivoicedness of discourses/meanings. Web videos, thus, enable students to develop new understanding about the subject matter they are learning.

Web Video Project and its Implications for Teacher Candidates

In spring 2010, we designed a Web video project, applying the LWV core principles and instructional components. The video project was embedded into a graduate teacher education course on technology and education at the University of West Alabama. This marked the first time that the LWV model was tested in an actual teacher education classroom environment. The purpose of the Web video project was to introduce teacher candidates to Web 2.0 and to provide them with opportunities to inquire collaboratively into the areas of Web 2.0 technology and its pedagogy, theories, discourses, and research approaches through the application of three sources of knowledge (i.e., scholarly, Web 2.0, and personal experience). Students were expected to engage with the readings of scholarly articles and share their own responses to the readings through a Web video enhanced weblog; to participate in classroom small-group discussions; and to produce their own Web video compositions integrating multiple modes of representations (i.e., video, image, audio narrative, animation). In particular, the Web video project included the following assignments: (a) student's personal philosophy about the use of Web video in current learning and future teaching; (b) a video weblog exercise; (c) participation in classroom small-group discussions; (d) production of student's own digital video and sharing it over the YouTube network; and (d) self-evaluation of video weblog and Web video podcast activities.

At the beginning of the project, students were asked to write a statement of what they thought about the educational potential of Web video for themselves as learners and for their students as future teachers. Then, at the end of the project they were asked to revisit their views. By the end of the project, an overwhelming majority of teacher candidates came to a solid agreement in considering Web video as indispensable for their learning and stressing the value of its distinctive qualities, such as: easy access and varying degrees of video content oversight, representation of multiple perspectives on the issue, and the possibility to link to or embed Web video into other websites.

During the video weblog assignment, students were provided with a *Blogger* space, in which they could think in virtual proximity to others with similar ideas, explore multiple perspectives, and explore their own understanding. Importantly, participation in a video weblog activity provided teacher candidates with an opportunity to engage in an authentic Web 2.0-based experience. Before weblogging, students engaged with the assigned reading and then searched for at least one relevant Web video using video sharing websites. It should be noted that no commercial or professional (i.e., with copyright restrictions) video clips were allowed to be used either for weblogging or in-class collaboration. Then, students composed a weblog entry consisting of the following elements: (a) a summary of the readings; (b) student's individual reflections; (c) a relevant embedded video and the rationale

for using it; and (d) a thought-provoking question that would be used for in-class small group discussions. In addition to posting their own blogs, teacher candidates were asked to comment on their peers' entries in a constructive way. Also, we began each class with collaborative classroom discussions where teacher candidates formed small groups for discussing the assigned readings, related thought-provoking questions posted on teacher candidates' weblogs, and relevant Web videos found by teacher candidates themselves. Active engagement of every teacher candidate in small group discussion was encouraged.

After four class sessions, teacher candidates started creating their own digital videos representing their understanding of the subject matter (i.e., assistive technology). The "video composition" process comprised the following stages: (a) selecting a topic; (b) scripting the design; (c) collecting own video footage or remixing/reusing other videos; (d) editing the video footage using MS Movie Maker , a video-editing software; (e) uploading the video podcast to the YouTube network and embedding it into their personal weblogs.

As active participants of the learning process, teacher candidates were asked for their input into the development of the scoring rubrics for weblog entries and video podcast production. Such rubrics were used as guidelines to carry a holistic analysis of their performance and to prevent learners from getting lost in the whole new experience and course expectations. The rubrics helped teacher candidates concentrate on assigned articles and relevant videos and, thus, facilitate students' reflection processes and become more precise in reasoning.

The embedding of Web 2.0 into teacher candidates' reflective blogs, as well as the production of their own videos and sharing them via Blogger were found to have a positive effect on the student's commitment to learning. The analysis of teacher candidates' self-evaluations suggests that teacher candidates' overall Web 2.0 skills improved, particularly Web video searching strategies, creating a video podcast, using video-editing software, and uploading a video to the website. We believe that teacher candidates' anxiety and lack of knowledge about Web video before the project launch were overcome and developed a higher level of concerns about the learning value afforded by the new format of the video. Furthermore, teacher candidates showed intense interest in the use of Web video in their learning.

Conclusions

The emerging type of Web video presents a culturally new video format of knowledge representation which lies in the de-centralized production of video narrative and the way this narrative is authored, embedding the ideas of bottom-up collaboration, user-created content, and community building. Web video sharing websites provide students with a broader sampling of video content that helps them explore the subject matter from more than one way of representing it. In particular, by browsing the volumes of Web video on video sharing networks, such as YouTube, students are able to view multiple and diverse perspectives on the same topic that has the potential to advance their understanding about the subject matter and to further their breadth and depths of knowledge in the discipline.

The proposed model of Web video-mediated learning can be an effective means of enhancing students' understanding of concepts and ability to construct new knowledge. End of course evaluation documents indicated that one-hundred percent of the teacher candidates believed they were more competent in the subject area as a result of the course activities. Evidence also suggests that teacher candidates were more inclined to the learning activities which were enhanced with the use of Web 2.0 technologies. A number of project participants even suggested that Web video should be mandatory for all students at their university. Additionally, when asked what the most beneficial aspect of the course was, several teacher candidates commented on the ability to learn in an authentic setting.

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