ENGAGING STUDENTS WITH REAL-WORLD EXPERIENCE IN THE WEB 2.0 ERA: AN EXPLORATION OF WEB VIDEO MEDIATED LEARNING IN THE UNIVERSITY CLASSROOM

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ABSTRACT

In the age of Web 2.0 dominance universities are under increasing pressure to investigate the educational applications of user-created content within the traditional culture of knowledge. There is a growing realization in the literature that the incorporation of user-created web video into the curriculum provides a number of pedagogical opportunities for active forms of learning and student-centred teaching practices due to its affordability, accessibility, semantic searchability, flexibility, and versatility. Predicated on the precepts of constructivism and participatory culture, this study aims to explore empirically the pedagogical application of the proposed web video mediated learning strategy in a graduate-level university classroom. Operating in a mixed-method paradigm, the researcher conducted a series of surveys, interviews, and collected learning artefacts in order to complement the survey data with subjective reflections on web video from a student's perspective. Data were collected from a non-randomized convenience sample of 17 master's students in education at a regional university in Alabama, United States. Analysis of data included descriptive and inferential test statistics, coupled with data derived from qualitative analysis. Evidence suggests that participants gained knowledge of web video, and felt more competent in digital media use and production as a result of the research treatment. Such attributes of web video as multimodality, entertainment, diversity of video content, instant gratification, and possibility for customization received an overwhelming positive response from participants. Students also voiced their concerns about the credibility of video producers and the accuracy of video content available on the Web. Further, students indicated their support for web video mediated learning activities – the critical appropriation of web video and the creative production of one's own web video. In particular, participants noted that video-enhanced blogging gave them opportunity to relate new concepts and ideas acquired from the assigned readings to self-selected user-created web video. This study led the researcher expand

our understanding of web video as a culturally new form of knowledge representation, and to conclude that the proposed learning architecture was critical to student's success by creating conditions for them to properly balance user-created web video with scholarly knowledge and to become active participants who are accountable for their learning.

DEDICATION

I dedicate this dissertation to the memory of my father, Nicolay Lupshenyuk, who taught me the values of a strong work ethic, diligence, and dedication to a task, which helped shape me into the person that I am today.

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CHAPTER ONE: INTRODUCTION

1.1 Statement of the Problem

As the number of Web 2.0 technologies continues to grow, and as more information is created and shared under open standards in a Web environment, universities are under increasing pressure to investigate the educational applications of user-created content within the traditional culture of knowledge production and distribution. Since the launch of YouTube in 2005, web video technology has reached an important milestone in its evolution. In particular, the YouTube platform and its convergence with other Web 2.0 technologies and with mobile computing have transformed the essence of web video, which is now produced and distributed to open and accessible video sharing websites that are maintained by community members and regulated by explicit community guidelines (Burgess & Green, 2009; Harrington & Weiser, 2011).

In the educational literature examining the adoption of web video, researchers have made a variety of claims regarding the benefits of web video use and production for university education, including the potential for web video to enhance student learning, increase engagement with course content, diversify the process of knowledge creation and sharing, and promote the cultivation of innovative and critical thinking (Bonk, 2008; Clifton & Mann, 2011; Holtzblatt & Tschakert, 2011; Kember, Brandenburg, & Murphy, 2007; Lazarus & Olivero, 2009; Lonn & Teasley, 2009; Salmon & Edirisingha, 2008). Despite these claims, leaders in the field of educational technology continue to call for better management of the application of Web 2.0 technology and its integration into

curricula; they also urge educators to revisit their pedagogies and personal philosophies as to the nature of knowledge and the way it is produced and distributed (Bates & Sangra, 2011; Dede, 2008; Jenkins, Clinton, Purushotma, Robinson, & Weigel, 2006).

The review of existing studies on the use and production of digital video suggests several generalizations about the state of our knowledge with regard to the effects of digital video on the learning process. First, the majority of studies have inquired into the educational benefits of viewing either video lectures or digital video as supplementary learning resources. In this vein, Kay (2012) has published a review of 53 studies on digital video in the classroom conducted between 2002 and 2012. His literature review indicates that 30 studies explored "video podcasts" (mostly referring to students' viewing of video lectures), and seven studies examined the process of students' video podcast production. In studies on the practice of video viewing, researchers have primarily focused on videos produced in proprietary formats, such as lecture capture recorded by or with the help of instructors or enterprise educational videos produced by established media companies (Bassili, 2008; Bracher, Collier, Ottewill, & Shephard, 2005; Copley, 2007; McGarr, 2009; Scutter, Stupans, Sawyer, & King, 2010). Although these video programs demonstrate a high regard for credibility and video quality and are mostly trusted by instructors, their content is often contingent on the knowledge and experience of particular individuals – either experts or university professors – 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). Enterprise video programs tend to expose students to video material that represents

"filtered" information – sometimes an outdated account of the subject matter studied – and favours one side of the issue (Bracher et al., 2005). Consequently, these video formats may isolate students from continually emergent knowledge and provide little or no opportunity for interaction with authentic experiences. Furthermore, the process of proprietary video production and publishing is expensive and strictly regulated by peer review guidelines, and students' access to the content of such videos is controlled under strict copyright licensing. Thus, much of this research is of somewhat limited use and does not meet the current educational needs of students who are faced with the rapid growth of user-created web video (Burgess & Green, 2009) and require a new set of skills to process this information (Jenkins et al., 2006).

Second, a large number of studies have explored video production as part of the curriculum in the forms of video podcasts, video composition, or digital storytelling. Much of this research has generally explored video production as a reflective exercise that involves either the recording of students' own reflections on their performance competencies (Boske, 2011; Calandra, Brantley-Dias, Lee, & Fox, 2009; Cocciolo, 2009; Revoir, 2011) or the capturing of practices for assessment purposes (Koc, Peker, & Osmanoglu, 2009; Lane, 2007; Leijen, Lam, Wildschut, Simons, & Admiraal, 2009; Masats & Dooly, 2011; So, Pow, & Hung, 2009). Only few researchers (Bishop, 2009; Hakkarainen, 2009; Revoir, 2011) have experimented with multimodal composition that involves planning, gathering information in various media formats, scriptwriting, editing, and then reorganizing collected media fragments into a cohesive and purposeful video narrative that can be shared with a larger audience over the Web.

Third, a large number of articles discussing the benefits and challenges of incorporating user-created web video into curricula, were produced by action researchers who explored the pedagogical influences of web video in teaching practices in which they were personally involved (Berger & Krousgrill, 2012; Bonk, 2008; Clifton & Mann, 2011; Ghasemi, Hashemi, & Bardine, 2011; Kuo, 2009; Sherer & Shea, 2011; Trier, 2007). Many of these researchers have relied on anecdotal evidence or rather simple survey approaches to gain insight into how students respond to the use of new media. Only few studies have attempted to explore user-created web videos in a systematic way, relying on more complex data collection instruments and data analysis procedures (Lee, 2010; Revoir, 2011; Zhao, 2010).

Thus, for university instructors and instructional designers, the question is one of how user-created web video, best epitomized by YouTube video, can be integrated into formal curricula so that the value of academic knowledge presented in scholarly publications would not be overshadowed or diminished in university academic culture. Mezirow (1997) suggested that meaningful learning "requires new information to be incorporated by the learner into an already well developed symbolic frame of reference, an active process involving thought, feelings, and disposition" (p. 10). Furthermore, the importance of studying course material in combination with video has been discussed for quite a long time. Sherwood, Kinzer, Hasselbring, and Bransford (1987) suggested that the use of video (in the form of videodiscs) tends to benefit student learning as it provides rich context for their learning, increased comprehension, and maximizes student attention to the topic.

In this study, I experimented with the application of the "Learning with Web Video" Model (predicated on the precepts of situated and distributed cognition theories), which offers a strategy for balancing students' appropriation of user-created web videos with scholarly knowledge in order to facilitate learning. Additionally, the means whereby user-created web video is produced and distributed over the Web are more likely "to destabilize the structures that filter information flow and knowledge construction on the Internet" (Macfadyen, 2006, p. 288) than to "clear a path" to knowledge for students. The Model being studied considers the integration of web video into learning as a *valuable adjunct* to classroom-based courses (rather than a replacement for traditional knowledge sources) that enables students to expand the range of authentic learning experiences, experiment with varying perspectives, and engage with expertise available from sources across the ever-expanding Web environment. Therefore, an understanding of students' perceptions about the integration of user-created web video into university curricula is of great relevance. Additionally, because no previous study has examined the appropriation of user-created web video as an integral part of academic curricula, it was of particular interest to explore the effects of user-created web video from an empirical basis and thus to provide some evidence to fill the gap in the research literature on web-enhanced learning.

1.2 Purpose of the Study

The purpose of this study was to explore the pedagogical application of web video mediated learning in an authentic learning environment at the university. This study was also intended to investigate students' inclination towards and their perceptions of web

video mediated learning, as well as to uncover whether the proposed Model has any ability to address the potential for incorporating user-created web video content into the learning process. Specifically, this study was focused on three research questions: (a) How do students' concerns about web video evolve over the duration of the Web Video Project? (b) What are the affordances and constraints of integrating web video into a traditional classroom-based course? (c) How does web video use and production facilitate student learning?

1.3 Research Methodology

Operating in a mixed-method paradigm, the research design included a one-group pretest-posttest case study and combined both quantitative and qualitative data, with the emphasis on quantitative data collection (Creswell, 1994; Fraenkel & Wallen, 2003; Willis, Thompson, & Sadera, 1999; Yin, 2003). This design allowed me to explore the impact of the introduction of a curriculum design featuring the Web Video Project, a prototype for web video mediated learning, within the authentic context of an ongoing university course. Specifically, the data collection model involved a survey method, semi-structured interviews, and a collection of learning artefacts produced by the participants over the period of the Project. Analysis of data included descriptive statistical analysis (such as frequency distributions, means, and standard deviations) and the repeated-measures analysis of variance. In addition, statistical analysis was complemented with the findings derived from qualitative analysis (such as frequent occurrences of thematic fragments in participants' responses) and illustrative examples of qualitative data (Creswell, 1994; Greene, Caracelli, & Graham, 1989).

1.4 Definition of Terms and Concepts

Participatory culture. "A culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creation, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices" (Jenkins et al., 2006, p. 3). Within the context of participatory culture, user-created web video represents the democratization of knowledge production and the development of more pluralistic, more community-driven academic discourses and information architecture.

Students' concerns. The feelings, motivations, thoughts, reactions, attitudes, and even emotional undertone a student might develop in regard to an innovative pedagogical practice (Anderson, 1997; Hall, George, & Rutherford, 1977). In the current study, student's concerns about web video are referred to as the perceptions, attitudes, and reactions of university students to web video mediated learning.

Student-driven learning. In this study, the term refers to the learning process, in which students take the initiative and the responsibility for their own learning and for meeting the learning expectations prescribed in a course syllabus. Specifically, students are expected to participate actively in managing and assessing their own learning activities in accordance with the learning guidelines co-developed with the course instructor. These guidelines provide learning expectations, detailed overviews of assignments, due dates, and self-assessment rubrics. Furthermore, learning activities are designed to encourage students to make their own choices, initiate personal challenges,

and incorporate aspects of informal learning so that they have an opportunity to explore further their own capabilities and develop new learning skills and personal attributes.

Web 2.0. The second phase in the evolution of the World Wide Web, Web 2.0 was designed with a series of user-centric and constantly improved software applications which allow for the possibility of personalized or self-designed production of media artefacts, participatory interaction and collaboration, and knowledge sharing over the Web. The user-friendly interface and intuitive functionality of Web 2.0 technologies make it possible to decrease dramatically barriers to creating, organizing, re-using, capturing, storing, indexing, or distributing a wide range of multimodal content that is open and accessible to anyone connected to the Internet. The concept of Web 2.0 is often associated with social media, blogging, content sharing, podcasting, tagging, social networking, mash-ups, and many other web services and applications (Anderson, 2007; Murugesan, 2007; Oreily, 2007).

Web video. Any digital video published to the World Wide Web is subsumed under the broad category web video. Since the Web is constantly evolving, the literature is overwhelmed with variations of terminology, sometimes technical jargon, applied to web video. Much of this language is still confusing (e.g., Internet or online video, streaming video, video podcast, vodcast, vidcast, netcast, webcast, user-created web video, open video, mobile video, and other variants). Some of these terms point to ways by which web video is distributed or published over the Web. For instance, video podcasting, best epitomized by iTunes, refers to a video file that is distributed via a Really Simple Syndication (RSS) feed and that needs to be downloaded before viewing.

With the proliferation of high-speed Internet and web technology refinements, video sharing, exemplified by YouTube, has become widely favoured, as it allows anyone to upload videos to a video sharing website and to view them in real time (without downloading them) in a web browser. The video sharing website usually generates a URL (i.e., a uniform resource locator, or simply a web reference to a video file) and an embed code for the video file to facilitate the process of sharing beyond the video sharing website, while keeping its original video file at one convenient and searchable location on the video service's web server (Harrington & Weiser, 2011; JISC, 2009). In the dissertation, the term "web video" is often used to describe user-created web video.

Video sharing website (or network). A web hosting platform that allows users to upload and make their own video content accessible over the Web. The video sharing website is maintained by a video-hosting service provider that provides storage space on a server and Internet connectivity. This study focuses exclusively on user-created videos uploaded to video sharing websites, best represented by YouTube, Viddler, MetaCafe, Dailymotion, which offer free video-related services (e.g., content management, database support, publication) whereby users can upload video clips and share them with a larger audience over the Web.

User-created web video (also referred to as grassroots, or amateur video). This type of web video, typified by the video content available on YouTube, emerges from bottom-up collaboration that enables anyone with an Internet access to create new video content or to add an extra value to existing video (e.g., video mash-ups) without the need to submit a video clip to any authority for approval. Furthermore, web video

viewers may interact directly with the producer of the video, "manipulate" the content of existing videos by adding their commentaries, or share video content with others by embedding web videos into their websites or social networks. In this study, the generic term "web video" is frequently used interchangeably with the term "user-created web video".

Enterprise video (also referred to as professional video). Any type of digital video (e.g., DVD video, televized programme, or web video) produced, owned, and controlled by media companies, professional groups, or educational institutions. The production of enterprise video is usually filtered via multiple channels (e.g., media company policies, advertisement influences, affiliations with organizations of authority, political agendas, peer review panels, etc.) and its final product is often subjected to copyright and proprietary distribution licensing. Furthermore, enterprise video is inexorably informed by the interests of the producer (e.g., a media company or educational institution) in terms of content and structure (Macfadyen, 2006).

"Learning with Web Video" (LWV) Model (also referred to as the Model). A proposed conceptual framework for web video mediated learning aimed at facilitating student-driven, authentic, and meaningful learning in the rich Web 2.0 media learning environment. Specifically, student learning is (a) predicated on the idea of the critical appropriation of multiple sources of knowledge (such as scholarly publications, user-created web video, and students' personal experience), and (b) mediated with web video and Web 2.0 technologies. The rationale behind the use of the aforementioned technologies for learning is to enable students to externalize their knowledge and thinking

in multimodal composition formats (i.e., video-enhanced reflections [blogging] and digital video production) and then to share their knowledge artefacts with their fellow students over the Web.

Web Video Project (frequently referred to as the Project). An instructional methodology and the organization of learning activities predicated on the LWV Model and tailored to the specific learning objectives of the Technology and Education course in a master's degree program. In this study, the Project is also used as a research treatment. More details are provided in Chapter 3.

1.5. Limitations of the Study

The study took place in the context of actual university classroom environment replete with specific contextual factors in the form of the Web Video Project that influenced the effects of treatment and provided explanations why the effects occurred. Since the study was executed at a moderate scale and in a short term, it posed some threats to the validity of the research findings. As such, any generalizations about the changes in the students' learning and their behaviour (e.g., concerns, attitudes, perceptions) should be made with the understanding of the possible limitations of the research design and procedure.

1. *Region of the participants.* In interpreting the results, it is important to recognize the location of the university where this study was conducted: a rural area in Alabama replete with certain local factors that cannot be replicated in another setting, and which may not be generalized to another situation (Mertens, 2010). Furthermore, the university is situated in the Black Belt region of central Alabama, which includes some of

the poorest counties in the United States. Along with high rates of poverty (i.e., over 40% of the population is below the poverty line), the area is characterized by a declining population, a primarily agricultural landscape with low-density settlement, high unemployment, and poor access to education and medical care. More than 50% of the population in the region is comprised of racial minorities (U.S. Census, 2010; Wikipedia, 2012).

2. *Non-probability sample*. A randomized experiment was impractical in this study due to logistical reasons, as well as the goal of investigating the potential impact of treatment on university students who had little or no exposure to Web 2.0 technology. In addition, the researcher needed a very specific type of university students who would agree to spend a good deal of their own time participating in project activities, as well as course instructors who would be willing to modify their course syllabi in order to accommodate the research needs. Thus, the researcher had to employ a convenience sampling strategy. In this regard, the findings cannot be generalized to a population of all university students using web video because the attitudes of students participating in the study likely differ from those who had previous exposure to Web 2.0 technology in academic settings.

3. *Small sample of participants*. Compared to the average response rate of 55.6% in empirical studies (Baruch, 1999), the response rate to the repeated surveys in this study was 65.4% ($N = 17$), with the exception of the response rate to the Concerns survey, to which 57.7% ($N = 15$) responded during the pre- and posttest administration. A review of the literature considers a number of potential factors that may decrease the

survey response rate, such as survey length, design attributes, and lack of compensation (Sheehan, 2001). Two factors were believed to have contributed to the failure of some students to complete surveys in class: (a) a lengthy survey, consisting of a relatively high number of survey items, and (b) a succession of three separate intensive surveys requiring the participants to click a separate link to each survey, located on the course blog. Additionally, only three students participated in the interview process. It is possible that these students were more motivated individuals, particularly given that the interviews were conducted in three phases. Overall, however, the participants' responses during interviews were constructive and encouraging.

4. *No control group*. There was no control group in the study; therefore, the participants were used as their own controls (Fraenkel & Wallen, 2003). The study was not intended to claim the effectiveness of the treatment, but rather aimed at examining and describing the changes that occurred in students' perceptions about the treatment between pre- and posttest administrations.

5. *Extraneous variables*. Some factors may affect student learning and student attitudes, such as the interests of the students, student flexibility and adaptability to emerging technologies, levels of development of critical thinking skills, motivation, and time available for completing the project assignments.

6. *Researcher's effects*. During fieldwork, I was not involved in the actual teaching and assessment activities. However, I advised course instructors on the methodology of the Web Video Project and provided direction on its associated instructional components to ensure the equal conditions of treatment delivered in each

course section, as well as the overall integrity of the research. Concurrently, I administered a number of surveys and interviews, and collected learning artefacts at the beginning, midpoint, and conclusion of the Project.

7. *Exploratory nature of research.* Since the research was exploratory, due to the novelty of web video in the educational field, the study took the form of a case study and aimed at exploring the impact of the Project on students' perceptions of their learning experience in a traditional, classroom-based university learning environment.

8. *Novelty and disruption effects.* Research treatment in the form of the Web Video Project was more likely to increase learning motivation due to the novelty of the instructional design and technologies used and, thus, might result in higher productivity due to the allure for participants of receiving special attention and being selected to participate in the study. Also, a few students expressed concern about the new learning strategy with regard to the use of multiple technologies that may disrupt their standard learning activities (Mertens, 2010).

1.6 Significance of the Study

In this research on the application of web video mediated learning, I attempted to contribute to a new wave of Web 2.0 research by gaining a deeper understanding of user-created web video as a means for transforming students' learning practice. First, this study identified the capacities of user-created web video and particularized the affordances and constraints for integrating web video into university instruction from the point of view of students' learning. Second, the examination of students' perceptions of the impact of web video mediated activities on their learning helped to pinpoint

challenges when dealing with web video use and production. Third, research findings and the potential implications discussed in this study will be of interest to faculty, instructional designers, and researchers familiar with Web 2.0 technology and its use in teaching and learning, and also to those who seek to understand the learning benefits and new challenges presented by recent transformations in video mediated pedagogy. Finally, this study provided direction for further investigation.

1.7 Organization of the Dissertation

The first chapter of the dissertation introduces the problematic of research on web video and discusses the rationale behind the integration of web video into university instruction. In addition, it delineates the purpose and framework of the study, provides a synopsis of the methodological arrangements for research design and implementation, and outlines the study's contribution to the field.

In Chapter Two, I provide an overview of key transformations that have occurred in video pedagogy within higher education, and then situate web video in the context of Web 2.0 developments and the participatory culture framework. I also review literature on the current practice and existing research on the use of web video in higher education. I then outline the constructivist theories of situated and distributed cognition that underpin the development of the "Learning with Web Video" Model, upon which the study is concentrated. I end the chapter by discussing the pedagogical ramifications of current research and theoretical frameworks by introducing the "Learning with Web Video" Model.

Chapter Three discusses the research methodology employed in the study, including the research parameters, research design, sampling strategy, components of research treatment, data collection instruments, and strategy for data analysis.

In Chapter Four, I report on the results derived from the analyses of data collected from the repeated web-based surveys, semi-structured interviews, and learning artefacts submitted by the participants over the period of the empirical investigation.

Finally, in Chapter Five, I discuss how this study extends knowledge of student learning mediated with web video in the university classroom by situating the research findings in the context of the existing literature. I also revisit the learning architecture of the proposed web video mediated learning model. I conclude the chapter by discussing some recommendations for further research and articulating the potential implications of the findings for pedagogic practice in a higher education context.

CHAPTER TWO: REVIEW OF THE LITERATURE

This chapter provides a critical review of the literature on video pedagogy and related learning theories, and is arranged in four sections. In the first section, I review literature on earlier and current practices of using video technology at the university level, beginning with an outline of the important milestones in the development of video as educational media. To avoid ambiguity, I define the scope of web video in the context of Web 2.0 developments and participatory culture. I then discuss the advantages and drawbacks of current practices for using web video in student learning. In the second section, I examine a rapidly growing body of research on the educational applications of web video in two capacities: the viewing of web video and the production of web video. In the third section, I discuss the theoretical grounding for the incorporation of web video use and production into university teaching and learning. In the final two sections, I consider the implications of current research and theoretical frameworks and then provide an outline for discussing instructional design of web video mediated learning, which constitutes the focus of the present study.

2.1 Account of Current Practice of Web Video Integration at University

2.1.1 Educational Use of Video Technology in Retrospect

In order to understand the role of web video in today's higher education and to avoid mistaken beliefs and misapplications of video in the future, it is important to reflect on the historical development of video technology. Since its inception, video has served as a tool to improve the learning process by enabling students to connect their learning to the real world. By conveying information using audio and visual signals, video

complements instruction with a sense of direct involvement and physical presence that provides students with opportunities to observe real-life situations, sequences in motion, rare or dangerous events, interviews with people who are distant from students in space and time, unfamiliar cultures of other nations, and the like (Caladine, 2008; Hutton, 1984; Roberts, 1998; Trotter, 1970).

In its original black-and-white format, video was first used for educational purposes in 1940s United States military training during World War II (Saettler, 1968). In the 1950s, "the decade of educational television" began (Anglin, 1995; Wisher & Curnow, 2003), with television giving instructors opportunities to place moving images and sounds in front of students (Caladine, 2008). University instructors explored opportunities to utilize television broadcasts as teaching aids in their classroom instruction (Trotter, 1970). More often, however, instructors used video tapes instead of broadcasts, since the former allowed for greater flexibility in terms of scheduling, and also provided the opportunity to pause, stop, and replay sections of the material (Caladine, 2008).

During the 1980s and 1990s, the use of television for instructional purposes became more widespread. Educational video programs were televised to classrooms via cable outlets, satellite dishes, or videotape recordings. It became possible to record on videotape any program that came into the school, taking into account copyright restrictions. The recording provided flexibility in use and the possibility of reuse (Anglin, 1995; Caladine, 2008).

During the 1990s, the use of video grew rapidly in distance education programs, while its adoption in traditional, face-to-face, classroom instruction declined. Due to the physical separation of students and instructors in the context of distance learning, video technologies were often used to facilitate both the interaction between instructors and students and the delivery of course materials. Applications of video in a distance education modality included instructional pre-recorded video lectures, televised instruction, interactive video, and video conferencing (Caladine, 2008; Wisher & Curnow, 2003).

The emergence of the World Wide Web and the development of digital technologies (e.g., digital camcorders, digital television displays, digital broadcasts) in the early 1990s enabled the transition from traditional analog (e.g., analog TV, VHS cassettes, videodiscs, etc.) to digital video (e.g., the storage and distribution of video content on DVD media, and live or on-demand streaming video content via satellite, cable, and Internet providers). Taking advantage of the greater flexibility, low cost, and prompt delivery afforded by the Web, many distance education programs began transmitting pre-recorded video lectures and other video content over the Web to their students. This type of web video is commonly referred to as a one-way web video (the first generation of web video); that is, students could only retrieve a video file stored on a web server by downloading it to their personal computers, there to be stored and played at their convenience. Although this capacity of one-way web video is similar to watching a televised video program, the ability to download the video file provided students with an opportunity to enhance their interaction with the lecture content and to focus on

particular segments of the video lecture by using the media player's control options (e.g., pause and rewind) (Caladine, 2008). The integration of the one-way web video into university instruction, at least in part, could be a major step forward in improving conditions for on-demand, flexible, and personalized learning.

2.1.2 Conceptualization of Web Video in the Context of Web 2.0 Developments and Participatory Culture

The introduction of Web 2.0 in the early 2000s and the continuous evolution of web technologies and online services have metamorphosed the landscape of the World Wide Web. The internet model began as *a static depository of web resources* predicated on a top-down structure in which proprietary content was produced and delivered asynchronously to Internet users for their passive and uninvolved consumption (i.e., viewing of web-based images or videos, listening to audio podcasts, or reading online articles without any engagement with the media in a web environment). This initial paradigm has given way to *a dynamic participatory network* where users are provided with open access and enablers (i.e., Web 2.0 applications and widgets) to enhance active collaboration and media production on the Web (Cormode & Krishnamurthy, 2008; Murray, 2007; Oreilly, 2007; Richardson, 2006). Under the umbrella of Web 2.0 technology, a staggering number of affordable and accessible applications and online services has been emerging on the Web landscape: blogs, RSS, audio and video podcasts, media sharing websites, social networks, wikis, social bookmarking, virtual worlds, media creating applications, Google apps, Twitter, cloud computing, and a myriad of other applications and widgets (i.e., web browser built-in applications).

Driven by the affordability of web technologies, along with their user-friendly interfaces and intuitive functionality, Internet users are engaging in the production and sharing of amateur media content either by manipulating or remixing existing media content, or by creating markedly different media artefacts (Cormode & Krishnamurthy, 2008; Murugesan, 2007). Improvements in wireless technology, coupled with the advent of mobile computing (e.g., smart phones and tablet computers), has allowed users not only to view and share web video, but also to record and publish video content to the Web using mobile devices and wireless connectivity. Furthermore, the development of video sharing web service has enabled users to publish and share their own videos over video sharing websites (e.g., YouTube, Dailymotion, Flickr, etc.) which are open to anyone and regulated by an explicit code of conduct (e.g., terms of use, community guidelines) (Harrington & Weiser, 2011).

The convergence of video sharing with wireless mobile devices (e.g., smart phones and tablet computing), Web 2.0 applications (e.g., blogs, video annotations, screencasting, video capture, and animation software), and media editing software (e.g., MS MovieMaker, Apple iMovie) has transformed the essence of web video and blurred the lines between video production and consumption. The flexibility and accessibility of emerging media technologies and web services, as well as the convergence of the Web infrastructure and mobile computing (including wireless accessibility) have generated interest in the development of user-driven (i.e., amateur) content of vernacular creativity, resulting in the democratization of media content production and the synchronization of media distribution (Burgess & Green, 2009; Jenkins, 2006).

On the whole, the coalescence of Web 2.0 attributes, technological advances in web video production and distribution, and mobile computing (see Figure 1) has contributed to the emergence of the concept of user-created web video by taking web video technology to new heights in its production, distribution, and usage. In the current media climate, anyone with a digital camera or cell phone and an internet connection is able to create video and then publish it to the Web, and to a potentially large audience. Web 2.0 and web video technologies allow anyone, regardless of the level of technology proficiency, to broadcast the message in a creative way and to communicate originally with the world.

As more and more people are producing and publishing user-created video content, the number of video sharing websites has grown dramatically. Besides providing online viewers with an opportunity to watch, upload, and publish video to the Web, the video sharing websites – YouTube being the most notable – enable users to participate in a diverse set of activities on the Web, such (a) searching for and discovering amateur videos (e.g., do-it-yourself, personal video journals, etc.); (b) interacting with web video authors/producers and other individuals across the globe by posting commentaries and video responses; (c) controlling the quality of web video content by rating video clips or reporting them as inappropriate; (d) disseminating video clips they find relevant outside the video sharing website's infrastructure by sharing links to the video clip or by embedding a code of the video into other websites or social network profiles (Burgess & Green, 2009).

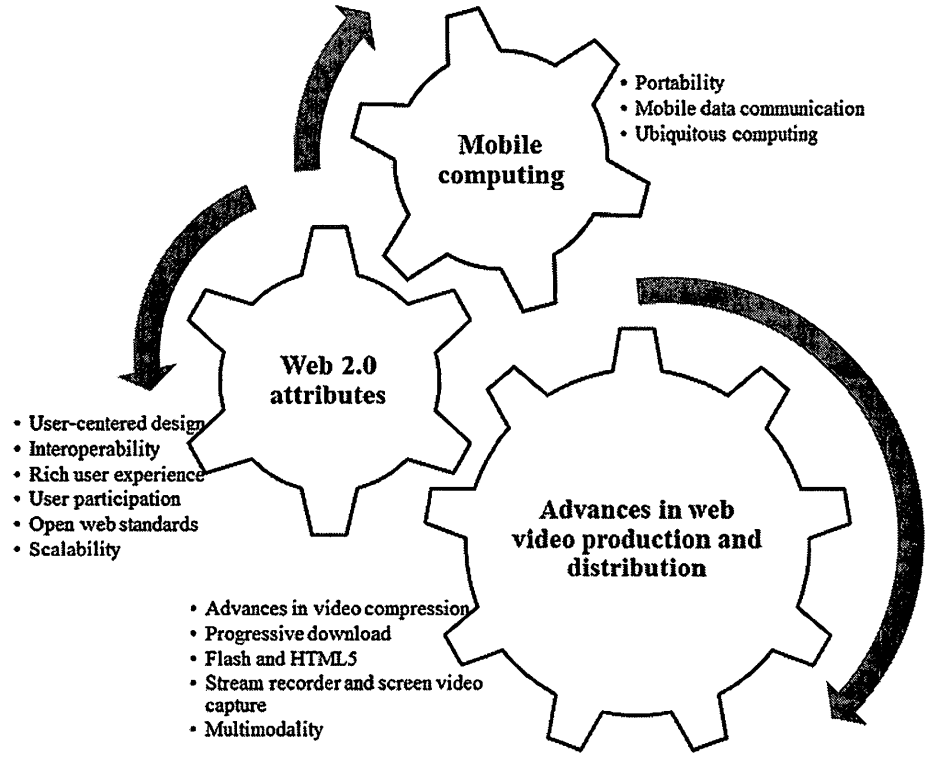

Figure 1. Factors affected web video development (Ozer, 2011; Simpson, 2008).

YouTube has become an important milestone in the evolution of web video technology. It is a free video sharing website offering a web-based venue for anyone with a video camera and an Internet connection to express and share the ideas and thoughts with the world (YouTube, 2012). Over 90% of video producers are more likely to use YouTube to share their video artefacts than other video sharing venues (Purcell, 2010). It is now the third most visited website worldwide and the fourth most accessed in Canada (Alexa Internet, 2012). According to the latest statistics provided by the company website, over 4 billion YouTube videos are viewed per day, and their viewership includes over 39 countries (YouTube, 2012).

In contrast to previous platforms aggregating video content over the Web, YouTube has been a pioneer in providing video sharing service on the Web. In particular, YouTube incorporated distinct capabilities for user participation in content management and distribution, which are now inherent in the architecture of most media sharing websites. Some of these participatory capabilities include (a) the ability to recommend videos to other users via the "related video" playlist, (b) the ability to share videos with others by sending links via email or by embedding the code of a video clip into other websites, (c) the ability to comment upon the video clip and to post a video response, and (d) the ability to watch the video in real time in a video player built into a web browser (Burgess & Green, 2009).

Although YouTube houses both user-created and professional videos, this study focuses on the exploration of user-created video content which has been conditioned by a participatory culture. The concept of participatory culture was first introduced by Jenkins and his colleagues (2006): "a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creation, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices" (p. 3). The authors argued that participatory culture – embodied in affiliations within online communities (e.g., YouTube), media creations (e.g., video making, re-mixing), collaborative writing (e.g., Wikipedia), and distribution of media creations (e.g., blogging, video sharing) – results in the reshaping of the Web landscape, the emergence of grassroots creativity and bottom-up participation, the development of

social connection between the consumers and producers of media content, and the blurring of boundaries between production and consumption.

This study is predicated on the argument that user-created content supported by media sharing websites challenges the traditional influence of authoritative knowledge produced, distributed, and controlled by an educational media industry that represents specific academic ideologies and power structures. In the current context of mainstream media and educational institutions, including scholarly publication and media production, media content (e.g., journal articles or instructional films) is manufactured and distributed through top-down structural mechanisms of control which filter out "unreliable" information and authorize "reliable" information on the grounds of authority and expert opinion represented by a limited number of producers and reviewers, such as a peer review panel (Burgess & Green, 2009; Macfadyen, 2006; Wong, Shephard, & Phillips, 2008).

In the context of participatory culture and open media sharing, the consumption of media content is no longer viewed as a final stage of the production process. In contrast, it becomes a dynamic stage for further innovation and improvement of the media product by involving individuals who are driven by intrinsic motivation, reusability of knowledge and skills, and practicality and usability of the end-product (Burgess & Green, 2009; Wong et al.,2008). For instance, Internet users can add some examples of authentic, unfiltered experience to a video uploaded to YouTube, which in turn extends the practice of consumption and makes the newly created video content more creative and sophisticated. From this "co-creation" standpoint, YouTube or any other video sharing

website becomes a platform for community participation and creates conditions for open and diversified content production and distribution (Burgess & Green, 2009; Jenkins et al., 2006).

Young people are the first users to become attracted to the idea of user-created content and open sharing and to the change it brings to their social interactions on the Web. Recent reports on the state of web video have clearly demonstrated the popularity of user-created web video and video sharing websites among young adults (18-29 years). In 2009, 81% of young adults watched video on video sharing sites (Purcell, 2010), representing a dramatic increase since 2007, when only 49% did so (Madden, 2007). In the field of education, such lively interest in user-created videos among younger demographics has brought some pedagogical concerns. For instance, some educators assume that new culture emerging around Web 2.0 is youth-driven, meaningless, troubled, confusing, under-regulated, savage, and "dangerously adrift from established forms of social interaction" (Driscoll & Gregg, 2008, p.73). Other concerns about the distribution of user-created web videos surround the following issues: (a) the cult of the amateur and mass popularization (Keen, 2007); (b) the lack of regulations needed to confront the use of copyrighted material and unethical online behaviour such as cyberbullying and online piracy; (c) the crisis of expertise and the perceived erosion of intellectual standards caused by the influx of amateur videos; and (d) the shift towards a cultural value system that challenges the existing ideological discourses and understandings of ethical standards as established by traditional mass media (Burgess & Green, 2009; Driscoll & Gregg, 2008).

Despite the increased volume of user-created web video content and the concomitant lack of content quality-assurance mechanisms, most active users who upload video content to video sharing websites seem to abide by copyright and community guidelines established by video sharing websites. Only 4% of such users appear to be reported as infringing copyright (Purcell, 2010).

Instead of blaming the Web 2.0 technology revolution and youth culture for cultural transformations precipitated by user-created web video and open sharing, Jenkins et al. (2006) propound the need for a pedagogical response. Specifically, they call for the development of new media skills with which to confront the challenges involved in the emergent culture – including the awareness of equal access and media influence – and with which to enhance community involvement in shaping new forms of web-enabled participation, related social norms, and ethical standards.

Thus, it is evident that web video is rapidly evolving in the context of technological and cultural transformations, and that user-created web video holds great promise for pedagogical practice and thinking. Within the environments of participatory culture and open sharing, user-created web video represents the democratization of knowledge production and the development of more pluralistic, more community-driven academic discourses and information architecture.

2.1.3 Pedagogical Capacities of Web Video and Obstructions to Its Use in University Education

Web video and video sharing websites have become valuable learning media worthy of being integrated into emergent e-learning modalities (e.g., web-enhanced,

online, blended, and mobile learning) in university education. There is a growing realization in the literature that the incorporation of web video into the curriculum provides a number of pedagogical opportunities for active forms of learning and student-centred teaching practices due to its affordability, accessibility, semantic searchability, flexibility, and versatility (i.e., its ability to be re-used, remixed, or mashed-up), along with the convenience provided by its on-demand accessibility (Berger & Krousgrill, 2012; Bonk, 2008; Kuo, 2009; Sherer & Shea, 2011; Trier, 2007).

Many of the benefits and challenges of integrating web video into the learning process are discussed in the literature written by faculty exploring their own transformational teaching practices and sharing the lessons learned. Faculty and students are particularly impressed by the potential of appropriating user-created web video to anchor content-related discussions and facilitate understanding of multifarious subject matter, such as complex concepts or foreign languages (Bonk, 2008; Clifton & Mann, 2011; Ghasemi et al., 2011;Trier, 2007). Furthermore, such new media offer students the opportunity to create their own video in order to externalize their reflective thinking and facilitate the development of creative multimodal composition and other new media literacy skills (Godwin-Jones, 2012; Kember et al., 2007; Kong, Shroff, & Hung, 2009; Selfe & Selfe, 2008; Tendero, 2006; Wolf, 2007).

Although the web video attributes expand opportunities for learning, the application of pedagogically sound instructional strategies is crucial in order to ensure the effectiveness of the learning process (Clark, 1994). In my review of the current state of web video use and production, I have identified five most common pedagogical

capacities afforded by the web video: (a) the capacity to stimulate and facilitate an understanding of complex concepts; (b) the capacity to advance analysis and reflection; (c) the capacity to facilitate active, student-driven, and personalized learning; (d) the capacity to cultivate originality and creative multimodal composition; and (e) the capacity to facilitate teaching and learning in equitable and flexible ways.

Web video enables facilitation of an understanding of complex concepts. The use of video sharing websites provides students with a broader sampling of videos that can help them to explore the subject matter from more than one representative angle (Bonk, 2008; Kay, 2012; Trier, 2007) or to learn a foreign language by observing authentic communication presented in a video clip (Ghasemi et al., 2011). Specifically, by browsing the volumes of user-created web video on video sharing networks such as YouTube, students are able to view multiple and diverse perspectives on the same topic, thereby potentially advancing their understanding of the subject matter and furthering the breadth and depth of their knowledge of the discipline (Kuo, 2009; Revoir, 2011). The appropriation of web video into academic discourse allows students to visualize theoretical explanations, and to observe and reflect on real-world content produced by real people who may demonstrate different understandings of the subject matter at hand (Caladine, 2008; Kay, 2012; Liberatore, Vestal, & Herring, 2012; Trier, 2007; Ullrich et al., 2008). According to Bonk (2008), shared web videos help students understand ' complex concepts (e.g., artificial intelligence or behaviorism) and heighten their curiosity about aspects of the subject matter by attaching new meanings to academic material and providing valuable ideas and insights.

Web video enables advancement of analysis and reflection. In teacher education, web video is often used to stimulate candidates' reflections on their teaching practice and to support the development of teaching quality (Barnes & Sutherland, 2011; Kong et al., 2009; Lazarus & Olivero, 2009). Instructors believe that enabling candidates to record their teaching practice using a camcorder, or even a cell phone, and then to share the recording with others for feedback provides students with an opportunity to engage in critical reflection based on the actual records of teaching practice, rather than based on their recollections or written notes. Instructors also note that the use of video helps candidates develop deeper and richer evaluations of their own teaching performance, and take greater responsibility for their own learning as they browse video recordings of other lessons in teaching practice (Calandra et al., 2009; Cheng & Chau, 2009; Marsh, Mitchell, & Adamczyk, 2010; Lazarus & Olivero, 2009; Saljo, 2009).

Web video enables the enhancement of active, student-driven, and personalized learning. Before the emergence of Web 2.0 technology and the rapid growth of video sharing websites, the producers of video content did not sufficiently consider either the expectations of students or the ways in which knowledge could be constructed and learned. For instance, most instructional videos were produced either by universities (including instructors' video lectures) or educational media production companies characterized by specific academic ideologies and power structures. Such types of video production were likely to provide little or no opportunity for interaction with the authentic experiences of others, and were likely to isolate students from continually emergent knowledge. With their broad sampling of video content on any

topic, video sharing websites are believed to attract students' attention and enhance their learning experiences by allowing them to customize the course content in order to better fit their own educational needs and expectations (Bonk, 2008; Hartsell & Yuen, 2006; Sherer & Shea, 2011).

Due to web video accessibility, students can access and view video material from any convenient place, whether on campus or at home, at any time, and in better-suited ways, either from their personal computers, mobile devices, or over the Web. Semantic searching and collaborative filtering features (e.g., related video playlists, tagging, ratings) allow instructors and students to access knowledge in multiple media formats, and to bring authentic experiences and multiple voices to academic learning contexts. Through collaborative filtering predicated on the viewing habits of "the crowd," video sharing websites make immediate suggestions of other videos relevant to a student's initial search (Ullrich et al., 2008; Wu, Ngo, Zhu, & Peng, 2012). Thus, the appropriation of user-created web video opens up opportunities for personalized learning by allowing students actively participate in the customization of their own curriculum based on their learning needs (Bonk, 2008).

Web video enables the cultivation of originality and creative multimodal composition. Through its convergence with Web 2.0 technology and mobile computing, web video offers great potential for enabling creative and artistic learning because of the significant opportunities it presents for remixing and transforming multimodal content (Bishop, 2009; Ullrich et al., 2008). Easy-to-use, compressed web video formats can be embedded into outside websites (e.g., blogs, wiki, Facebook, etc.), and also facilitate

higher-level usage such as mash-ups[1] or remixes of various videos, audio files, screencasts, and other modes of representation (Burke & Snyder, 2008; Godwin-Jones, 2012). Wireless mobile devices such as cell phones, iPhones, or tablets, in combination with video sharing websites, accelerate the development of new approaches to engage students in creating video-based content. With a cell phone in hand, students can record an authentic practice that takes place in a real-life context and then, without technical difficulty, share the footage with others by uploading it to a video sharing website (Ullrich et al., 2008).

Web video facilitates equitable and flexible teaching and learning. Monge (2007) suggests that the combination of video and verbal instruction helps to empower the lecture and to communicate meaning to students. Instructors often choose to post video lectures or related demonstrations on YouTube website for students to view at their convenience. In particular, Haase (2009) uses YouTube to upload videos of lectures for students to make use of in the event of a cancelled lecture or student absence. He calls this practice "a directed study assignment" which allows students to engage with the lecture material, which Haase complements with questions and investigative exercises. The literature also suggests that students find the complimentary video class quite useful as a venue in which to address questions that could not be covered during class time. Owing to the accessibility of video sharing platforms and open content, instructors can now optimize their delivery of knowledge and facilitate student learning in fair, equitable,

[1] A video mash-up is a derivative digital video created by blending two or more different media sources (e.g., text, graphics, audio, video fragments, animation), which are often extracted from existing digital media.

flexible, and personalized ways (Kember et al., 2007; Salmon & Edirisingha, 2008; Sherer & Shea, 2011).

It should also be noted, however, that web video use and production are not without their constraints. Potential challenges in harnessing the learning potential of web video might include (a) students' distraction on account of the amateur nature of user-created video that could be unduly entertaining or contain inappropriate language, (b) the risk of being unable to access a particular video that could be taken offline from a video sharing website without notice, (c) time constraints and the lack of technical skills needed to search for appropriate video content, (d) ethical and legal challenges, (e) questionable scientific accuracy and credibility of amateur video content, and (f) the instructor's failure to provide instructional support and to explain the rationale behind web video integration (Bonk, 2008; Burke, Snyder, & Rager, 2009; Lane, 2007; Sherer & Shea, 2011; Yuen, Yaoyuneyong, & Yuen, 2011).

Clearly, web video might be productively integrated into the learning process in university education given its potential to stimulate cognitive enrichment and to personalize student learning through the immediate, multi-faceted, multi-vocal, and real-life information embedded in user-created web videos. It is particularly suited to student-centered learning designs in which students are provided with opportunities to choose which videos to watch in order to support their learning. With the integration of video sharing websites students are able not only to view a broad sample of user-created video content, but they are also provided with an opportunity to interact with the authors and

producers of video and other members of the network and to share their own video content with a broader audience.

2.2 Account of Prior Research on Web Video in Higher Education

Research on learning with traditional video, such as instructional film, educational television, and CD- or DVD-based video in university education is well documented (Cennamo, 1993; Christie & Collyer, 2008; Tan & Towndrow, 2009; Trotter, 1970; Zuber-Skerritt, 1984). While web videos are being increasingly incorporated into university curriculum, researchers are just beginning to explore their educational potential in order to understand how they shape learning and how web video mediated practices influence students' learning behaviours. Furthermore, the growing body of research makes little mention of the pedagogical applications of user-created web video, often generically called "video podcasts" or "shared online video." To gather and review relevant empirical articles, a literature search was carried out using the ERIC database as well as the search capabilities of the leading educational technology journals, such as *The Australasian Journal of Educational Technology*, *Research in Learning Technology*, *Computers & Education*, *Educational Technology Research and Development*, *Australian Educational Computing*, *The Internet and Higher Education*, and *Journal of Educational Multimedia and Hypermedia*. Using search terms like "web video," "online video," and "video podcast," coupled with "university" or "higher education," I retrieved 125 relevant journal articles published between 2006 and the commencement of 2012. Given that this study focuses on the impact of the use and production of web video on student learning in traditional university contexts, I selected for this review 42 reports of

empirical studies, including five doctoral dissertations, which have direct bearing on the present study. The research contributions of these studies are discussed from two perspectives: the pedagogical influences at the university level of (a) video viewing (i.e., the use or appropriation of an existing web video) and (b) video composition (i.e., production).

2.2.1 Research on Video Viewing in the Classroom

The examination of the effectiveness of video viewing on student learning involves the analysis of studies investigating the use of enterprise video, video lectures, and video cases of teacher practices (also known as videopapers). One of the advantages of video viewing is that it usually takes place in the classroom and the video content is selected by the instructor from a reputable source that produces high quality recordings and delivers accurate and reliable information to students. Most of the video content is authored and created either by expert practitioners, instructors, and departmental technicians, or by professional filming crews, thereby ensuring the quality of the footage. Another learning benefit of viewing video lies in its ability to augment text-based information and to provide an additional medium for students to explore and critically view the connections between text and video (Moreno, 2006; Sherwood et al., 1987). The multimedia representations that provide context to the text appear to benefit students' understanding of the topic and increase their level of engagement (McCrory, Putnam, & Jansen, 2008).

Most students find video viewing in the classroom helpful, useful, and gratifying since it might present interesting stories or unusual viewpoints on the subject matter

(Burke et al., 2009; Choi & Johnson, 2007; Hung, 2009; Kay & Kletskin, 2012; Mitra, Lewin-Jones, Barrett, & Williamson, 2010; Tang & Austin, 2009). In a study by Bracher et al. (2005), the researchers made use of an instructional video about back care and how to deal with it in a hospital setting. The video was produced by the university and was accompanied by a written teaching guide. Despite a small number of the participants in the study, students' perceptions of the web video were positive. Most of them enjoyed the convenience of watching the video over the web, rather than using the video recorded on CD-ROM, and thought it enhanced their understanding of the topic.

When instructors set the stage before directing students to the video material, students indicate that they become more focused on learning the subject matter through dynamic visualization enabled by a video mode that helps them bring course-related issues to life and stimulates their interest in the subject matter. For instance, Mitra et al. (2010) note:

> Where a lecturer clearly sets out the purpose of watching the video and uses it to provoke thought and/or discussion, then it will be less likely that students remain passive. However, if a lecturer passively uses a video as a replacement for an entire lecture then it is likely that students will passively view the video, unless specific tasks are highlighted before the video is watched. (p. 413)

In addition, Hung (2009) suggests that the mediation of video recordings enables cognitive reinforcement and engages students in evaluation of their own performance, resulting in increased affective motivation. Beyond encouraging students to learn, web video, with its real-time rewinding capability, has been used to facilitate understanding of

complex concepts and problems, to encourage active engagement with the topic, and to improve deep conceptual learning (Clifton & Mann, 2011; Craig, Chi, & VanLehn, 2009; Kay & Kletskin, 2012; McCrory et al., 2008; Mitra et al., 2010). In contrast to text-based information, web video is believed to be an effective medium to stimulate student interest in the subject and to introduce students to authentic situations and real-life challenges (Choi & Yang, 2011; Kuo, 2009; Merlino, 2009; Mitra et al., 2010). Video can capture contextually rich environments in ways that a text mode cannot, enabling students to understand the significance of information and the meanings of alien concepts, and to make elaborations when they experience gaps in their understanding of the material they have learned and read about (Liberatore et al., 2012; Sherwood et al., 1987). Furthermore, a number of studies have demonstrated that video viewing enhances learning by helping students connect new ideas and existing knowledge, by encouraging deep learning, by stimulating further exploration of the subject beyond the prescribed curriculum, and, of course, by providing examples on specific topics (Liberatore et al., 2012; Masats & Dooly, 2011; Mitra et al., 2010).

In the field of teacher education, videopapers and video cases of teaching practice are particularly relevant to this study due to their authentic and contextual dimensions. For instance, they bring to the fore the intricacy and richness of a real-life classroom setting by documenting sequences of teaching activity and by recording student-teacher interactions. The resulting evidence provides more trustworthy representations of the learning environment than those presented in verbal recollections and written reports (Koc et al., 2009; Lane, 2007; Masats & Dooly, 2011; Saljo, 2009).

Using video cases in the classroom allows instructors not only to anchor the students' detailed and complex discussions about classroom teaching methods, but also to make sense of captured voices and body language of the teacher and students (Hennessy & Deaney, 2009; Koc et al., 2009).

In a study by Wu and Kao (2008), web video was used for peer assessment of micro- and field-teaching. Preservice teachers videotaped their peers' teaching sessions (10-15 minutes), converted them to digital format, and uploaded them to a web-based peer assessment system, where students could view videos and reflect on each other's teaching competences. Most of the students reported that they enjoyed watching the video over the web and thought it improved their performance through allowing them to view real-life instances of their own and other students' practices.

In another similar study (Leijen et al., 2009), researchers examined the influences of web video on undergraduate students' reflections on their performance competencies in the context of dance courses. Students were asked to report what they had learned from observing the performance from multiple perspectives, and what they had learned from the feedback from their peers. The researchers found that viewing one's own performance against those of others helped one recognize and evaluate one's own practice and "develop a more realistic view" of one's performance. The evidence suggests that web video assisted students in making a detailed assessment of their own practice and others' experiences as well. This finding supports the results found in previous research on videopapers in teacher education. Furthermore, the investigators hypothesized that bringing web video into the learning process was likely to make

students feel more confident in their abilities to evaluate their own performance, and therefore less reliant solely on the instructor's judgment. In addition, students reported that they felt safe, comfortable, and trusting when sharing their ideas and suggestions for improvement. Comparing their findings with the research outcomes reported in similar studies conducted in different educational contexts, the authors concluded that their results with regards to the effects of web video on peer feedback were consistent with those of other studies.

While most studies on video viewing focus on facilitating students' comprehension, studies of video cases and videopapers, which allow students to zoom in on and freeze a particular video episode, are significant in that they offer insights into the potential of using video recordings of classroom activity to raise critical awareness of the quality of teaching and to allow instructors to reflect on their own teaching and the teaching of others (Koc et al., 2009; Lane 2007; Masats & Dooly, 2011; So et al., 2009). In addition to the capacity to facilitate reflective practice, the researchers (Masats & Dooly, 2011; Saljo, 2009) found that videopapers can help students develop media literacy competencies, documentary strategies, and analytical skills needed to conceptualize the language and images captured in the recording and turn it into a coherent, meaningful narrative.

Video viewing also involves students' use of video lectures recorded by instructors, often called either video podcasts of lectures or lecture captures. Video lectures offer great potential benefits for students by increasing the flexibility of learning and by allowing customization of the learning content (Copley, 2007; McGarr, 2009;

Scutter et al., 2010). While acknowledging the potential of the instructor's video lectures to bring a transformational change in the delivery of the lecture content and to supplement the learning experience of students, researchers nonetheless find themselves in an on-going debate on whether the use of video lectures facilitates student engagement in the classroom and improves their performance (Bassili, 2008; Copley, 2007; McGarr, 2009). Empirical evidence suggests that the supplement of the video lecture afforded by repeated viewing, pausing, and bookmarking increases understanding of the material and allows for the clarification of issues or questions raised in class (Parson, Reddy, Wood, & Senior, 2009). However, students demonstrate concern in case if the learning process involves only video lectures (Dey, Burn, & Gerdes, 2009). As with other video viewing experiences, research shows that video lectures bring diverse expertise and experiences to the learning context that can complement the students' learning opportunities and increase their engagement with an instructor (Wang, Mattick, & Dunne, 2010).

Bassili (2008) investigated students' attitudes to and preferences for viewing lectures online, compared to attending lectures in person. The author presented evidence that the students' attitudes toward and preferences in the choice of media were contingent on either their motivational orientations (e.g., natural curiosity about the subject matter, the value of the course to the student, anticipation of academic success) or their cognitive strategies (e.g., information-processing skills, memory strategies, metacognition techniques, resources management strategies). The author conducted a correlational study (N=847) in which he analyzed not just demographics and attitudes towards online versus traditional lecturing, but also learning preferences and habits, and examination scores.

The research showed that most students who were highly motivated and interested in the subject matter inclined towards viewing video lectures, while students who valued peer interaction and monitoring were more likely to attend lectures in physical settings. These findings suggest that students view convenience as the main factor contributing to their choice of viewing video lectures.

Despite numerous learning benefits of video viewing, researchers have emphasized that video alone cannot fulfill students' needs and improve the effectiveness of instruction. This claim is supported by both faculty and students' perspectives. For instance, the researchers investigating students' perceptions about the effectiveness of five different media technologies (Tang & Austin, 2009) argue that instructors need to balance the use of technologies in order to improve the effectiveness of their teaching and increase students' performance. They found that students may mistakenly believe that video, in contrast to the lecture, might help them succeed faster with less effort, an assumption that may lead to the erosion of the students' accountability for their learning. A study by Saljo (2009) found that multimodal presentations did not improve long-term information retention, but did enable students to make connections between theory and practice because of the contextual richness and live capturing.

Accessibility and pedagogical concerns need to be addressed when students work with proprietary enterprise web video. Accessibility concerns are often associated with copyright restrictions on the film, meaning that access to video can be limited to the university Internet Protocol address. In a study by Bracher et al. (2005), some of the participants reported that they were unable to watch the video as it required a particular

video player software. In relation to the content of the instructional video, a few participants opined that the scope of the video was narrowed to only one context and was quite outdated. Analyzing participants' reactions, researchers infer the pedagogical concerns arising from students' failure to view the proprietary enterprise web video. In this case, the research team recommended providing clear guidance on how to bring students' attention to web video use. They suggested that the instructor should reinforce the following three components to make video viewing experience meaningful and effective: (a) "reminders" on how and where video can be accessed; (b) video demonstration during class sessions to trigger students' inquisitiveness; and (c) assurance of the utility of video as a learning resource. Other researchers (Choi & Yang, 2011; Mitra et al., 2010; So et al., 2009) state that instructors should provide students with proper support on how to engage critically with video and challenge the authentic content of the video program that in turn would lead to active, meaningful, and effective learning rather than entertainment-like and passive learning.

2.2.2 Research on Video Production in the Classroom

In contrast to the practice of video viewing, the practice of video composition involves planning, collecting video footage (including capturing original shots or borrowing existing video fragments; gathering images and audio files; and creating animation), scriptwriting, editing, and reorganizing video fragments into a cohesive and purposeful video narrative. Then, video compositions, produced by students, can be distributed via digital media (e.g., CDs, DVDs, and external USB-drives), or published to the Web (e.g., video sharing websites, social networks, or course management systems).

The extant literature demonstrates that more and more faculty, even those who are new to emergent technologies, are encouraging and experimenting with multimodal composition in their courses in the forms of video podcasts, video composition, or digital storytelling (Kay, 2012). Research shows that students perceive video composition activities as being relevant to their own needs. The research also suggests that instructors need to embrace video production, thereby reducing their dependence on a text-mediated culture (e.g., lectures, readings either in print or digital formats), and to tailor student-driven multimodal activities to fit students' diverse learning preferences and multiple intelligences (Cheng & Chau, 2009; Lee, 2010).

With experience of video editing and production, students' technology skills and video production competencies (e.g., shooting and editing a video, scriptwriting) are more likely to improve, which subsequently makes a video composition activity an effective and feasible means for acquiring digital competencies and media literacy (Bishop, 2009; Chang, 2004; Hakkarainen, 2009; Heo, 2009; Masats & Dooly, 2011). In the field of teacher education, research indicates that a hands-on engagement of teacher candidates with the video production experience makes them more open to the transformational pedagogy influenced by technology integration. It also tends to improve their self-confidence in the application of educational technology, as well as in project management and collaboration skills (Cheng & Chau, 2009; Hakkarainen, 2009; Heo, 2009; Yuen et al., 2011).

Some studies report that students feel less nervous producing a video and publishing it to the Web than they would completing the assignment in-class in front of

their peers (Hakkarainen, 2009; Revoir, 2011). In particular, scriptwriting and video editing are considered by students to be the most difficult stages of the video production process, which in turn might cause negative emotions and some resistance to a video production activity as a whole (Cheng & Chau, 2009; Hakkarainen, 2009). In this case, researchers suggest making scriptwriting and editing experiences more collaborative in order to bring more than one perspective to students' decision-making process (Hakkarainen, 2009).

Many theorists and researchers support the claim that authenticity is inherent in a video production activity, implying that students are enabled to get involved with a real-world environment and then make their own decision as to which experiences and artefacts they want to integrate in their own personalized video story (Calandra et al., 2009; Lombardi, 2007; Maina, 2004; Sadik, 2008). In particular, Hakkarainen (2009) notes that the realization that students are challenged with a real-world activity generates positive emotions and impels them to develop new ideas and to find an original solution to the problem stated in the assignment. At the same time, Cheng and Chau (2009) highlight that self-confidence in technology proficiency and task relevance are more likely to motivate students to engage in the design and production of meaningful video composition and result in an increased level of understanding of the subject matter.

Research evidence suggests that using video compositions as a reflective exercise offers new opportunities for transformative change in student learning, promoting approaches to stimulating critical reflection and widening students' understanding of themselves and their identities as depicted in video narratives (Bishop,

2009; Boske, 2011; Cheng & Chau, 2009). Researchers demonstrate evidence that students favour the visibility of learning and appreciate the opportunity to share openly their thoughts and experiences in such a way that they can be viewed and manipulated by their peers, and possibly by a large audience (Boske, 2011; Cocciolo, 2009; Revoir, 2011). While working on their video reflections, students engage not only in the analysis of their own thinking but also in the assessment of the subsequent impact of their voice, their pace of speech, and their body language as embedded in their video reflective narrative (Boske, 2011). Students composing video reflections, compared to those engaged in verbal reflection exercises, tend to produce lengthy and conceptually connected reflections and to present more than one standpoint (e.g., practical, contextual, and/or critical) on the issue (Calandra et al., 2009).

Bishop (2009) investigated the impact of multimedia composition and related reflections on the development of self-awareness and the construction of teacher identities. With the aid of iMovie, a digital video editing software, students were asked to produce either individually or in collaboration with other students a digital narrative, called Digital Literacy Project, by incorporating video, text, audio, and still image in purposeful, intertextual, and dialogic ways. The researcher's interpretation of participants' experiences provided valuable insights into the context of that practice, which was of particular interest to this investigation. The author argued that a multi-layered intertextual fabric embedded in students' digital narratives could bring references to other discourses, perspectives, opinions, and identities located outside the classroom. As students became involved in developing the discourse of their narrative, they seemed

to incline more towards an individual rather than a collaborative approach to composing a digital video project. The evidence suggested that this shift to self-regulation entailed students' need for the uninhibited freedom of creativity in pursuing their work. By the same token, if self-directed students experienced any difficulty, they attempted to engage in "outside" relationship and collaboration. When a new tier of intricacy was added to the production of a digital narrative, it enriched the narrative discourse with multi-voicedness (e.g., a blend of media genres such as newscasts, reality TV, and documentary).

A number of studies explore the role of support and assessment in video production activities. Boske (2011) emphasizes the importance of providing adequate guidance for students to help them develop their reflective capacities, as well as the significance of creating an emotionally safe environment during video production activities in order to facilitate the development of proneness to critical evaluation of knowledge regardless of whether it comes from the instructor's lecture, reputable academic sources, or dubious amateur video. When assessing the quality of a student's video composition, instructors should take into consideration (a) the time frame of a video production assignment, (b) the technical equipment to which students have access, and (c) the students' actual experience with video production, including technological, project management, video planning, composition, and editing skills (Hakkarainen, 2009).

When students participate in multimodal production, it is important to reinforce the construction of multiple identities and give students a means of developing self-sufficiency in learning, and also to allow them to challenge an authoritative and rigorous

academic discourse replete with value-laden meanings, multiple utterances, and contradictions between authors (Bishop 2009; Boske, 2011). In addition to the pedagogical guidance, research suggests that instructors should supply students with "just-in-time" training covering the technical processes involved in the design and production of video composition (Cheng & Chau, 2009; Hakkarainen, 2009).

2.2.3 Research on Students' Concerns about Technology-Mediated Learning as Pedagogical Innovation

The successful implementation of any technology-mediated learning instruction is conditioned by students' internal commitment (Moore & Kearsley, 1996). A number of research studies (Dobbs, 2005; Ertmer et al., 2002; Liu, Theodore, & Lavelle, 2004) applied the concerns based adoption model (CBAM) (Hall, George, & Rutherford, 1977; Hall & Hord, 1987; Hall & Loucks, 1977) to explore the participants' concerns about the successful adoption of technology in either face-to-face or online learning environments. The CBAM is a well-researched model which describes how individuals learn about an innovation and the stages of that process. It defines learning as a seven-stage developmental process, during which an *individual's concern* shifts from concerns about an innovation on a personal level (i.e., self or internal concerns) to concerns about mastery of tasks associated with an innovation (i.e., task or management concerns) and to higher-level concerns about the effectiveness of an innovation (i.e., impact concerns) (see Figure 2). Concerns can be interpreted as individual's feelings, perceptions, expectations, attitudes, or reactions with regard to an innovation. It is assumed that participants who are the beginners in the adoption of the innovation are more likely to have a higher degree of

internal concerns, such as awareness, informational, and personal concerns. When they start to engage in an innovation, their concerns about managing the innovation (including the concerns about task performance, learning management, time, and resources) are more likely to grow while their internal concerns are expected to decrease. As participants advance with the process of adopting the innovation, they become more concerned about the impact of the innovation on their learning practice, including consequence, collaboration, and refocusing concerns.

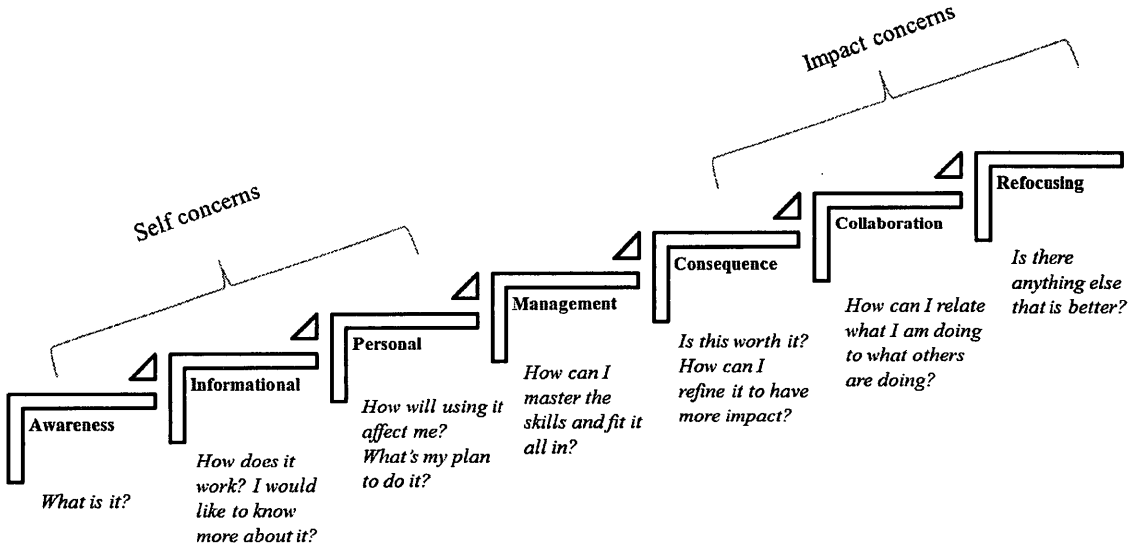

Figure 2. CBAM stages of concern. Adapted from "The CBAM: A Model of the People Development Process," by B. Sweeny, 2003. Teacher Mentors. Retrieved from http://www.teachermentors.com/CBAM.php. Copyright 2008 by Barry Sweeny, Best Practice Resources.

Liu et al. (2004) investigated the attitudes of education students toward the technological intervention carried out through WebCT. They found that learning over the web effectively changed the participants' concerns about technology integration at each

stage of concern. In another study, Ertmer et al. (2002) examined the impact of participation in an online professional development course on school administrators' concerns about technology integration and methods to facilitate teachers' use of technology in a K-12 environment. Dobbs (2005) used the Stages of Concerns Questionnaire to examine the effects of videoconferencing on students. The researcher indicated that significant differences, supporting the technology intervention, were found in stages of informational, consequence, collaboration, and refocusing concerns.

Because close attention was being given to the understanding of the changes in students' concerns about web video in this study, I advanced the hypothesis that the change in students' concerns about web video would be facilitated by the instructional intervention (i.e., web video mediated learning scenarios) directed toward the individual student's development of the higher level concerns about the ways of utilizing web video in order to maximize learning outcomes. In other words, in order for students to perceive the value of the web video technology in the improvement of their learning, they need to be exposed to its advantages in the authentic context of their learning. Furthermore, students need to be guided during the adoption process; their concerns about, reactions to, and possible constraints with using web video for learning should be addressed in the classroom so that they are provided with any immediate assistance they may need during the adoption process of the new technology in order to facilitate their learning (Bailey & Palsha, 1992; Hall & Hord, 1987).

2.3 Conceptual Framework for Integrating Web Video into Learning

In previous sections, I discussed the pedagogical potential of integration of web video use and production into university instruction, taking into consideration the accounts of practice shared by faculty, as well as the findings of empirical studies by educational researchers. In this section, I discuss the theoretical framework involved in the design and effective implementation of web video mediated learning which is derived from a synergy of a constructivist epistemology and its learning theories: situated and distributed cognition, which provide pedagogical suggestions on how to harness the potentiality of web video and facilitate active, deep, and meaningful learning.

Learning was traditionally treated as a cognitive process occurring in the head of the learner, whereas the role of the environment was not explicitly articulated. With the emergence of Web 2.0 technology and participatory culture, educators and scholars have begun to re-think what it means to learn in this kind of world. The term constructivism appears with increasing frequency in recent studies related to the educational use of web video technology. To begin with, constructivism is a complex philosophy that challenges the objectivism which postulates knowledge as being absolute and reflective of a real world that exists separately from the individual. Constructivists, on the contrary, assert that knowledge is subjective and relative, since the individual interprets and constructs knowledge about reality based on his or her own experience and interactions with the environment (Jonassen, 1990). There has been a considerable debate in the literature about the constructivist epistemology resulting in the emergence of various perspectives of constructivism – radical, quintessential, cognitive or endogenous, social, postmodern,

and others (Moshman, 1982; Philips, 1995). In line with current research, I shall limit my discussion to the cognitive and social orientations of constructivism which will lead to the discussion of situated and distributed cognition theories.

Cognitive constructivism emphasizes the role of the cognitive abilities of the individual learner in the construction of knowledge. The epistemology of this constructivist perspective derives from Piaget's stage theory of cognitive development, in which he hypothesizes that individuals construct their knowledge while they attempt to make sense of the real world. Knowledge is emergent and adaptive as individuals regulate continuously their existing knowledge (or schemas) towards new experiences they explore (Piaget, 1952).

Jerome Bruner (1973) expanded this constructivist school of thought by viewing knowledge construction (or knowing) as an act of discovery enabled by a reflective learner prepared to evaluate information through a different lens and make it applicable to real-life situations. He emphasized the importance of developing metacognitive awareness to protect learner's cognitive structures from information overload:

> The child who has flooded himself with disorganized information from unconnected hypotheses will become discouraged and confused sooner than the child who has shown a certain cunning in his strategy of getting information – a cunning whose principal component is the recognition that the value of information is not simply in getting it but in being able to carry it. (p. 405)

In contrast to cognitive constructivism, social constructivism emphasizes the role of the social and cultural forces of the environment in the development of individual

knowledge. Furthermore, it attempts to integrate internal (i.e., the cognitive effort of the individual) and external (i.e. the social environment) aspects of the constructivist learning paradigm. Lev Vygotsky (1962), who is considered to be a foundational influence on the development of this constructivist perspective, argued that knowledge construction occurs in the social context and through the interactions between learners and their environments. In particular, Vygotsky's theory posits that learning is mediated between the learner and the more knowledgeable other. Then, through social interaction, knowledge, actions, and values are appropriated (or internalized) by the learner in order to apply them in new and different ways (Slavin, 2003).

While the cognitive and social perspectives reflect different views of how knowledge construction occurs, many educators and researchers seem to agree about the implications of constructivism for the learning process. In this regard, learning is viewed as an active and ongoing process of constructing one's own understanding or the meaning of the real world. By applying their existing knowledge and experience, students actively engage in learning activities grounded in authentic and real-world contexts (Barab & Duffy, 2000). According to the perspective of social constructivism, teachers act as facilitators, rather than as transmitters of information and knowledge, with functions of creating a learning environment for active knowledge construction by understanding students' mental models and by adjusting teaching methods and curricula to students' existing knowledge and experience (Slavin, 2003). Following this line of reasoning, the effectiveness of learning is contingent upon the student's prior knowledge, educational experience, and learning preferences rather than student's individual cognitive capacity.

Schwartz and Fisher (2003) offer two approaches on how teachers can deconstruct their traditional teacher-centred pedagogy and, thus, facilitate the learning process of actively constructing knowledge rather than "borrowing representations" of the teacher or memorizing the "right" answers. One approach includes the stimulation of students' intellectual curiosity and understanding with a variety of contexts, presented with guidance from an instructor and text, which are needed for students to make "personal meaning" of the subject matter and to create their own complex representations. Another approach is to provide students with the opportunity to ask thoughtful questions and to search for answers so that students can organize their "personal complex representations" into a coherent story and draw their own conclusions about the subject matter. Therefore, knowledge is meaningful when it is constructed by students as they attempt to understand deeper the subject matter and make sense of their own learning experiences. Otherwise, the authors believe that the knowledge transmitted by a teacher "is not long-lived and is more difficult to coordinate into the kinds of abstractions that are valued in university discourse" (p. 29).

In sum, the cognitive and social perspectives of the constructivist theory in the field of education posit three general assumptions with regard to student learning: (a) learning is an active process where learners construct their own understanding of knowledge; (b) knowledge is co-constructed by the learner through social interaction with other learning participants; and (c) understanding of knowledge is contingent on learner's prior knowledge and experience.

2.3.1 Constructivist Theory of Situated Cognition

The concept of situated cognition, articulated in the seminal work "Situated Cognition and the Culture of Learning" by John Seely Brown, Allan Collins, and Paul Duguid (1989), tends to theorize learning at individual and social levels. These proponents of situated cognition argue that knowledge is contextually situated and is intrinsically affected by the learning activity and the authentic situation in which it is used. Knowledge is dynamic and understanding of its meaning is constantly constructed through its use in new situations: "Even these [concepts] are not wholly definable and defy categorical description; part of their meaning is always inherited from the context of use" (Brown et al., 1989, p. 33).

This notion of situated knowledge has important implications for the conceptualization of the learning process. It suggests that learning is an emergent and dynamic process of the learner's continuous and sophisticated interaction with real-world contexts, and with experiences of other individuals, activities, and culture:

> Activity, concept, and culture are interdependent. No one can be totally understood without the other two. Learning must involve all three. Teaching methods often try to impart abstracted concepts as fixed, well-defined, independent entities that can be explored in prototypical examples and textbook exercises. But such exemplification cannot provide the important insights into either the culture or the authentic activities of members of that culture that learners need. (Brown et al., 1989, p. 33)

While constructing a new understanding of knowledge, the learner, like an apprentice, is exposed to multiple and diverse perspectives on how that knowledge can be

applied and understood (Brown et al., 1989; Lave & Wenger, 1991). The observation of knowledge in a given context and the participation in authentic settings allow learners to construct useful knowledge and to make sense of experts' experience embedded in authentic practice. Furthermore, learners actively appropriate the behaviour and value systems of the culture they observe. Ultimately, they transfer acquired practice, knowledge, and culture across contextual boundaries (Barab & Duffy, 2000; Barab & Roth, 2006; Brown et al., 1989).

Authentic activity, as argued by situated cognition theorists, is a pivotal component of the learning process (Barab & Roth, 2006; Brown et al., 1989; Lave, 1991; Wenger, 1998). It is more informative and meaningfully productive than disembodied school-based learning with its explicit knowledge in the form of school textbook examples, teacher's descriptive explanations, and other abstract representations inherent in classroom instruction discourse (Brown et al., 1989). The use of such decontextualized knowledge, which is separated from real-life experience, is meaningless and might lead to students' misconceptions of domain knowledge and weak relations between what is taught and what is experienced firsthand (Lave, 1990). Building an understanding of domain knowledge relying only on easily articulated generality and explicit knowledge undermines the value of "contextual noise" – situated meanings and tacit knowledge – that is embedded or "hidden" in social fabrics of discourse and cannot be explicated fully (Bereiter, 1997; Brown et al., 1989; Lave, 1991).

Based on an extended literature review, Herrington, Oliver, and Reeves (2003) define 10 attributes describing an authentic activity: (a) real-world relevance, in contrast

to decontextualized academic formalism; (b) ill-defined learning problems which are open to interpretations; (c) the ability to examine the problem from more than one perspective; (d) the complexity of the task; (e) the provision of a collaboration opportunity; (f) the provision of reflective opportunity; (g) the possibility of interdisciplinary exploration; (h) assessment integration; (i) the creation of a purposeful and useful product; and (j) creating conditions for diversity and competition. When provided with the above conditions, students are more likely to immerse themselves in real-life problem solving and to encounter various levels of challenge in the learning experience.

Learning makes sense in practice and is developed through engagement in domain-related dilemmas, enabling learners to build rich implicit understandings of the subject matter they are studying (Barab & Duffy, 2000; Barab & Roth, 2006; Lombardi, 2007). By observing different experiences and circumstances embedded in authentic activities at the periphery, learners are enabled to produce idiosyncratic representations of knowledge structure and its meaning. Though knowledge becomes dependent upon the context of the activity in which it is constructed, it simultaneously becomes part of a learners' cognition through their engagement in the activity (Brown et al., 1989; Norman, 1993).

From a "social practice" standpoint, Jean Lave (1990; 1991) introduced the concept of situated activity, suggesting that individuals learn by engaging in practice (i.e., social activities) with other individuals. She identified three meanings of this concept. First, the situatedness of activity means that learner's mental representations and

participation are situated in space and time, rendering knowledge relative to the learner's experience within the activity. Second, situated activity means that knowledge construction and understanding of its meaning occur through social interaction with other participants situated in a particular cultural and social setting. Third, the situated character of activity means that the development of conceptual knowledge takes place under multiple and varied conditions of everyday activity. Within this line of reasoning, she developed and successfully applied an apprenticeship learning model predicated on the idea of the wholeness of an individual's cognition and the social world.

One of the key methods to engage students in situated activities is cognitive apprenticeship that "supports learning in a domain by enabling students to acquire, develop, and use cognitive tools in authentic domain activity" (Brown et al., 1989, p. 39). In its entirety, cognitive apprenticeship provides the conditions for students to observe the authentic practice of experts and their behaviour at various levels of participation and to construct their knowledge through social interaction and collaboration within the domain culture, rather than the school culture (Brown et al., 1989). By examining narratives and participating in the verbal exchange of ideas, students engage in discourses of conceptual meanings, "sociohistorical coordinations of people, objects (props), ways of talking, acting, interacting, thinking, valuing, and (sometimes) writing and reading" (Gee, 1997, pp. 255-256), which help them develop the ability to think as well as the ability to participate in the thinking process.

To reiterate, the theory of situated cognition highlights three categorizations of the learning process: (a) context-driven knowledge, (b) authentic learning, and (c) situated

activity where knowledge is socially constructed. At its core, the theory of situated cognition implies that learning is an integral part of the individual-environment transaction (i.e., social interaction) occurring within authentic activity in rich real-life situational contexts.

2.3.2 Constructivist Theory of Distributed Cognition

The theory of distributed cognition proposes that intelligence is not a single entity but can be an interrelationship or network of resources that an individual uses to solve problems and generate new ideas. This position moves beyond the notion that intelligence is a measurable unit contained within the head of an individual. The concept of distributed cognition supports the view that intelligence is an interaction between the innate abilities of individuals and the cultural environment. This interaction involves learning-thinking tools, for example, computers, PDAs, MP3 players, paper and pens. It also encompasses references and stored notes in written or digital forms. The network of people who can be accessed by the individual either directly or through technology adds to the functional collective intelligence of the individual (Resnick, 1996). An implication of this theory for educators could be that, by utilizing technology efficiently and by giving learners the skills and the tools to harness technology, we can increase the individual's distributed cognitive network. This shift can have positive implications for the individual's intellectual performance.

The emergence of information and communications technology, such as audio, video, computer, and the Internet, caused us to acquire knowledge in different ways. Recent literature on knowledge construction discusses the phenomenon of cognition as a

distributed activity that transcends the capacity of the individual's cognitive apparatus (Cole & Engestrom, 1993; Pea, 1997, Salomon, 1994). In other words, knowing happens not only within the confines of individual's mind, but also among other individuals and the physical and social environments.

The idea of distributed cognition stems from the debate in the early years of the 20th century among psychologists, some of whom argued that higher cognitive processes (such as reasoning) require cognitive resources beyond those of individual consciousness – that is, resources which have the capability of preserving and distributing social and cultural experiences in an objective manner (e.g., printed or written work) (Cole & Engestrom, 1993). Distributed cognition approaches focus on the processes taking place in an extended cognitive system where multiple learners participate in activity through interaction with each other and with artefacts such as physical tools (e.g., computers) and symbolic representations (e.g., graphs, texts, pictures, concept maps) (Pea, 1997). In education, the distributed cognition approach has often been used to evaluate collaborative activities (Cole & Engeström, 1993), to understand the effects of technology on the design of learning environments (Pea, 1997), and to examine the role of technologies in supporting social interaction in knowledge construction (Resnick, 1996).

To study distributed cognition, psychologists often take activity system or praxis as a unit of analysis through which to examine the major areas in practices of distributed intelligence: people, artefacts, internal cognitive processes, and external representations. To perform a task, individuals bring their knowledge and experience and share their

cognitive repertoire with other individuals through their interactions. While interacting, the dynamic relationships between the individual and the group are mediated by the shared repertoire of knowledge and experience ("mediated artefacts"), by unequivocal regulations and procedures ("rules") assuring interaction among the participants, and by a "division of labor" that is intended to assign tasks and roles to the participants (Cole & Engestrom, 1993).

Learning is enabled by the learners, their intelligence and desire, and manifest through collaborative activities. At the same time, artefacts as bearers of intelligence shape the activity and provide resources for guidance and greater accessibility to higher-order thinking and deeper understanding. Importantly, when interacting with artefacts, in particular with technology, learners should be introduced to the functional properties of the artefact so that they perform the task efficiently (Pea, 1997):

> We exploit intelligence from objects when we use them instrumentally in activities. And we often need to decouple intelligence from such objects to reuse them in novel ways. Once such intelligence is designed into the affordance properties of artefacts, it both guides and constrains the likely contributions of that artefact to distributed intelligence in activity. (pp. 70-71)

To capitalize on knowledge embedded in artefacts, learners can deploy a range of different strategies: (a) observation of how the artefact can be used and imitation of its uses through simulations; (b) hands-on exercise to explore the affordances of the artefact; and (c) guided participation in the use of the artefact (Pea, 1997).

Distributed intelligence, therefore, is embedded in activity and the dynamics of interaction, not in individuals' minds, communities, or objects. The pedagogical goal of a distributed cognition framework is to shift learning by rearranging the approach to knowledge building from an isolated (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).

2.3.3 "Learning with Web Video" Model: Instructional Design Strategy for Web Video Integration into Learning

Web 2.0 developments offer today's university instructors more opportunities to facilitate the learning process, including interaction, knowledge creation, and cultivation of innovative thinking and higher-order cogitative skills. With the increased popularity of Web 2.0 technology and social media in higher education, educators and scholars have argued widely over the paradigm shift occurring in the learning process, a shift which entails significant changes in the different areas of learning, such as the development of shared and context-dependent knowledge, the adoption of active learning strategies, and the emergence of collective intelligence (Dede, 2008; Tapscott & Williams, 2006). The literature demonstrates that user-created web videos are often incorporated into university curriculum and, if they are used appropriately, they can facilitate active learning and improve student understanding. Under these circumstances, good instructional design for the integration of user-created web video is essential.

In this study, I mapped out a framework titled "Learning with Web Video" (LWV) Model, which proposed an instructional methodology and the organization of

web video mediated learning. This Model gave me an opportunity to examine to what extent students' conceptions of web video mediated learning were explained by the ontological constructs of situated cognition and distributed cognition theories, and to contribute to the discussion about how the emerging types of web video can facilitate transformations of learning practice in the context of traditional university instruction.

The LWV Model adheres to constructivist learning approaches and takes into account the unique contributions of previous research and current instructional practices on web video and its attributes of openness, flexibility, immediacy, and multimodality. According to the constructivist epistemology, 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. The concepts of situated and distributed cognition provide clues on how potentially rich learning opportunities of using web video might best be harnessed to foster student-driven meaningful learning.

The situated perspective assumes that information cannot be consumed and converted into knowledge in isolation. The situatedness in rich contexts of authentic practice is required. When learning is embedded in rich situations and social contexts where meanings can be constructed, students pick up both implicit and explicit knowledge. In this Model, the concept of situatedness is fostered by critical appropriation of existing user-created web videos that allows students to observe authentic experiences from multiple perspectives. Video provides much richer specific contexts than general, text-based narratives or verbally mediated ones (Sherwood et al., 1987). There is no need for learners to come out of their putatively "artificial" learning context in order to engage

in authentic practice. Video sharing websites and networks are well supplied with "just-in-time" content that can be personalized and delivered to the student immediately.

Furthermore, the idea of appropriation (Francis, 2010) is embedded in the instructional design of rich learning contexts to help students establish synergetic relationships between text- and video-mediated cultures (Sherwood et al., 1987), authoritative and participatory cultures (Jenkins et al, 2006; Mitra et al, 2010), and authentic and formalistic learning (Barab & Roth, 2006; Brown et al., 1989; Herrington et al., 2003). In other words, the learning process in this Model is predicated on the coordination of three sources of knowledge: (a) scholarly knowledge (i.e., represented by the instructor's lectures and prescribed course readings); (b) contextual or situated knowledge (i.e., represented by the user-created web video content selected by students on their own); and (c) students' prior knowledge and learning experience. It needs to be noted that all learning activities and assessment procedures composing the Model are permeated with the coordination of these three sources of knowledge. It is my assumption that the critical appropriation of user-created web video content and its combination with other knowledge sources can help students examine the topic presented in the assigned readings and in class lecture, modify their existing knowledge about the topic, and perhaps construct new knowledge and develop new understandings about the topic being studied within the course.

A situated cognition perspective also acknowledges that knowledge is emergent and fluid and therefore cannot be prescribed. In this Model, learners are encouraged to consider alternative data sources (i.e., user-created web video) and to search for multiple

knowledge domains to re-organize knowledge and construct a new understanding of that knowledge. In this regard, I assume that the user-created video content, compared to authority-driven enterprise video (e.g., television programs or DVD-based instructional films), is not filtered, and that it does not contain "pure knowledge." Hence it can stimulate students' learning, challenge their thinking, and teach them to evaluate critically the content of user-created web videos.

The theory of distributed intelligence views the knowledge-building process as an interaction between students and knowledge artefacts. In the current Model, a user-created web video is considered as a designed artefact that carries the intelligence of the author(s) or producer(s) and has the capacity of facilitating deep and reflective understanding. The Model is intended to engage students into active, participatory, and meaningful learning mediated with web video, as well as to provide them with opportunities to situate the course content and to test for their comprehension validity in real-world contextual circumstances with the help of constructive web-enabled peer commentary and classroom discussions in small groups.

The Model focuses on two learning scenarios: (a) the critical appropriation of existing user-created web video and (b) the creative production of students' own web video. The first learning scenario of *the critical appropriation of web video*, adopted from Bonk's (2008) discussion of the use of shared online video as an "on-demand conceptual anchoring," is integrated with blogging technology. Blogs, as representations of individual voices and community connections, provide students with a space for reflection, for communicating their own thinking to others, and for exploring multiple

perspectives in a blogosphere (Mortensen & Walker, 2002; Oravec, 2003; Richardson, 2006). In this Model, the critical appropriation of web video in the form of video-enhanced blogging is intended to help students make connections between scholarly knowledge, user-created web video, and personal experience.

The second learning scenario of *the creative production of web video artefacts* is intended to engage students in the composition of their own video narrative and in sharing the product with a larger audience on the Web. The integration of video production is intended to enhance critical reflection and knowledge development and to enable students to document their thinking in a rich media format that can be streamlined and shared across the Web.

Both scenarios are contextually driven and require students to participate actively in learning activities to create knowledge artefacts that are meaningful to themselves and/or to their fellow students in the class. I argue that video-enhanced blogging and web video production have the potential to provide students with motivation to construct their own meaningful, usable knowledge base about the subject matter from information provided by instructors, research and theoretical discussions, outside experts, amateur video clips, and previous personal experience and existing knowledge structures. Since these two learning processes are mainly student-driven and allow students to externalize their thinking in their own multimodal artefacts, students are also given opportunities to work together with their peers and instructors to analyze and refine their work to produce usable knowledge and develop reflective thinking. Furthermore, these two learning scenarios are designed to help foster the values of participatory culture, with its open

standards of producing knowledge, by embedding user-created web video into students' learning experience, thereby allowing for visualization, contextualization, and customization of the learning material.

To recapitulate, the process of incorporating web videos into academic discourse and the process of student learning has two significant functions. First, it has the capacity of situating student knowing/knowledge construction within the broader contextual environment surrounding authentic cultural and social situations. Second, video sharing websites such as YouTube, TeacherTube, and Fora.tv make available various user-created artefacts that reflect other individuals' conceptions of the world and their cultural experiences. That being said, user-created web videos can be viewed as means of learning that expose learners to a multiplicity of diverse perspectives and a multivoicedness of discourses and their meanings. Thus, its use in university instruction enables students to develop new understandings of the subject matter in the context of authentic learning.

2.4 Chapter Summary

In this chapter, I provided an overview of key transformations that occurred in video pedagogy in the context of higher education, and then conceptualized the phenomenon of user-created web video in the context of Web 2.0 developments and the participatory culture framework. Thus, I argued that web video represents the democratization of knowledge production and the development of more pluralistic, more community-driven academic discourses and information architecture. As discussed in a review of literature on the current practice of web video use, web video and video sharing

websites have been widely adopted by faculty seeking opportunities to enhance and diversify student learning, by stimulating engagement, interaction, knowledge creation and sharing, and cultivation of innovative and critical thinking. Research evidence has demonstrated that students find web video much more convenient and accessible compared to video programs delivered via CD-ROM or video lectures delivered in traditional learning settings. Since the first uses of digital video technology for teaching and learning, researchers have been exploring its role in improving the quality of learning and increasing access to education.

In a discussion of the literature related to existing research on web video, I reviewed studies which examined the effects of video viewing and video production on student learning. Among the major findings of research on video viewing were that digital videos tend: (a) to stimulate students' interest in the subject matter and keep them focused on learning the material; (b) to facilitate students' understanding of complex theoretical constructs and improve deep conceptual learning; (c) to engage students in evaluation of their own performance; and (d) to introduce students to authentic situations. Many of these studies focus on the proprietary formats of video programs produced either by the faculty or established media companies that may isolate students from continually emergent knowledge and provide little or no opportunity for interaction with authentic experiences. Key benefits of digital video production included: (a) an improvement in students' media literacy proficiency and self-confidence in technology use; (b) the higher levels of engagement with real-world learning; and (c) the advancement of students' creativity and their reflective capacities. In line with a constructivist perspective on

learning, this evidence implies that web video supports students in taking a more active role in assessment processes of learning performance, both of their own performance and that of their peers.

The research findings discussed in this chapter are consistent with the constructivist learning theory, which posits that learning occurs in practice and is developed through the discovery of different experiences embedded in authentic activities. In particular, situated cognition theory implies that learning is an integral part of the individual-environment interaction occurring within authentic activity in rich real-life situational contexts. A shortcoming of most studies is that researchers employed video viewing as a supplemental learning resource, prescribed by an instructor and produced either by a university or by the instructors themselves. By having access only to such prescribed videos, students are held back from exploring learning material from multiple and diverse perspectives; from challenging the curriculum, ideas and values of their practice; and from taking intellectual risks while constructing knowledge and searching for new meanings. By contrast, the critical appropriation of user-created web video and the creative production of one's own web videos – the essential features of the proposed "Learning with Web Video" Model – can offer these and other learning opportunities. Given the pedagogical appeal of the Model and the issues derived from extant research, I used the Model to guide the design of an instructional intervention and then to explore the pedagogical application of web video mediated learning in an authentic learning environment at the university. Specifically, this study aims to explore the nature of web video as a culturally new form of knowledge representation, and to

understand its potential for creating and sustaining authentic and student-driven learning. In this study, I examine three major research questions that give the direction to the investigation: (a) How do students' concerns about web video evolve over the duration of the Web Video Project? (b) What are the affordances and constraints of integrating web video into a traditional classroom-based course? (c) How does web video use and production facilitate student learning?

CHAPTER THREE: RESEARCH METHODOLOGY

In this chapter I describe the research methodology for the present study, which investigates the pedagogical application of the "Learning with Web Video" Model in a university academic course. Since much of the research took place in the field, I begin the chapter by providing a brief overview of the research site and fieldwork logistics, addressing the rationale behind my decision to conduct the study in the selected institution. In the subsequent three sections I establish the research parameters for the study by restating the research questions, proposing hypotheses, discussing the methodological arrangements, and identifying a sampling strategy for the study. Then I provide a description of the research treatment, the Web Video Project, and review its essential components: rationale, design and organization, learning support and technologies, and project learning assignments. There then follows a section on data collection with a series of subsections describing the survey method, the interviewing technique, and a collection of participants' artefacts. I end the chapter by discussing the procedures for data analysis.

3.1 Setting the Context

This doctoral research was conducted in a graduate-level instructional technology course at a public university that is located in a rural community in Alabama and serves the educational needs of nearly 2,300 residential and 2,800 online students enrolled in associate, baccalaureate, magisteriate, and education specialist degree programs in a variety of academic fields. About 40% of total student enrolment is accommodated by its

College of Education, which is accredited by the National Council for Accreditation of Teacher Education (NCATE).

The rationale for selecting this institution as the venue for my doctoral research work was two-fold. First, the university faculty was strongly committed to engaging their students in learning the emerging technology used in K-12 education. Prior to the fieldwork, I consulted with the academic administration and the senior faculty members at the university's College of Education about the possibility of pursuing my investigation in one of their graduate-level academic courses. I put forward my research proposal in the form of a blueprint for the Web Video Project, which constituted a research treatment, and an outline of research purposes and procedures. The proposal was met with support from the college administration and faculty, who recognized the potential of web video and related Web 2.0 technologies to improve the quality of student learning, foster new digital media skills, yield higher learning satisfaction, and increase the efficacy of student learning. One of the university academic administrators and senior faculty members volunteered to serve as a liaison between the university and the researcher and to be an on-site facilitator during fieldwork. This professor had broad experience with the university administration and was highly knowledgeable in the fields of instructional technology and online learning. She was also instrumental in selecting and adapting an appropriate graduate-level course for my research, and coordinating students' participation in data collection activities for the duration of the Project.

Second, the graduate student population at this institution was of particular significance in that these students had little previous exposure to Web 2.0 technologies in

a formal educational setting. This criterion was crucial in selecting this particular venue for my fieldwork. (It would have been extremely difficult to find university students in Toronto-area universities who were unaccustomed to the use of web video and Project-related Web 2.0 technologies for academic learning purposes.)

Prior to fieldwork, I received approval for my investigation from both the Institutional Review Board for the Protection of Human Subjects at the Human Participants Review Committee at York's Office of Research Ethics (Appendix A) and the participating university (Appendix B).

3.2 Research Questions and Hypotheses

The overarching goal of this study was to explore the application of the "Learning with Web Video" Model in the context of a traditional, classroom-based, graduate-level university course. The investigation was focussed on two learning scenarios proposed in the Model: (a) the critical appropriation of user-created web video content in the form of video-enhanced blogging and (b) the creative production of students' own web video artefacts. The main questions this research aimed to answer were:

- *RQ1*: How do students' concerns about web video evolve over the duration of the Web Video Project?
- *RQ2*: What are the affordances and constraints of integrating web video into a traditional classroom-based course?
- *RQ3*: How does web video use and production facilitate student learning?

In addition to the research questions, I proposed three hypotheses to be tested in this study:

- H_1: As students progress through the Project, their low-level concerns about web video will subside, while high-level concerns about web video will increase.
- H_2: As students progress through the Project, they will recognize the learning value of web video use and production.
- H_3: As students progress through the Project, they will achieve greater levels of web video use and production skills.

3.3 Research Design and Procedure

This doctoral research was conducted simultaneously in two identical sections of the "Technology and Education" course over a period of six weeks – from January 27 to March 04 – in the 2010 spring semester. This graduate-level course was a mandatory degree requirement for the master's programs in teacher education. The purpose of this course was to give students the foundational skills for integrating educational technology into classroom settings and to help them achieve a greater understanding of the process of technology integration in K-12 educational settings. It covered current issues in educational technologies, methods for integrating technology into classroom instruction, and strategies for teaching students to apply technology to gather information, interact, and facilitate learning. During the course, students were engaged in studying theories about integrating technology into teaching and learning, and about how classroom applications of educational technology might contribute to the design of more effective face-to-face learning environments.

In this study I applied a mixed-method approach (Creswell, 1994; Willis et al., 1999; Yin, 2003) in order to address the research questions and to gain a better understanding of what was happening when students were introduced to web video mediated learning activities. I combined a quantitative approach with a "less-dominant" qualitative approach. This mixed-method approach was intended to provide complementary evidence, thereby improving the interpretation of quantifiable findings and contextualizing the emerging aspects of web video mediated learning as gleaned through the nuances of participants' subjective learning experiences (Creswell, 1994; Greene et al., 1989).

To explore the application of web video mediated learning in a "real-world" educational setting and investigate the changes in students' perceptions of learning experiences affected by their participation in the Web Video Project, I employed a one-group pretest-posttest case study (Fraenkel & Wallen, 2003; Yin, 2003). The research design is illustrated in Figure 3. During the 6-week period, both sections of the course participated in the Project. One section met on Wednesday nights, the other on Thursday nights. Each of the two sections was taught by a different course director, but both used the same course material and followed identical syllabi. To ensure equal conditions for the implementation of the research treatment, I had weekly meetings with both instructors to discuss and confirm a set of instructional activities required by the Web Video Project, and to coordinate data collection activities. In addition, I attended all class sessions of both course sections to confirm the equality of research conditions for the participants in the study.

Figure 3. Diagram of one-group pretest-posttest design.

Before the research treatment was implemented, I introduced the study to the students in each section and explained how their participation in the study and the Project would benefit them. Students were informed that the Project was to be incorporated into the course syllabus and was mandatory to meet course requirements, whereas their participation in research activities was voluntary and would be compensated with additional points towards their grade for the Project. This arrangement was specifically made to encourage students to participate in data collection activities. The students who volunteered to take part in the study were asked to read and then sign the Human Participant Informed Consent Form (Appendix C). This form declared that any data collected from participants would be held in confidence, and that their student identification numbers would never be released or used in any publications. The participants were also informed that they had the right to withdraw from the study at any time, for any reason, if they so chose, and that their decision to withdraw from the study would not influence their final grade in the course nor their relationship with the researcher, course instructor, or the university.

At the method level, I used a mix of quantitative and qualitative techniques for gathering and analyzing data (Strauss & Corbin, 1998). I conducted a series of pre- and posttest surveys relying on participants' self-reporting and self-evaluation, followed by statistical data analysis, including statistical hypothesis testing. In addition, I complemented quantitative data collection and analysis with a qualitative research component consisting of a series of individual interviews and a collection of artefacts produced by participants (i.e., personal statements about web video and its influence on their learning philosophy, and self-assessment reports on video-enhanced blogging and web video production). Specifically, the data collection procedure was carried out in three phases over the period of the study (see Figure 4).

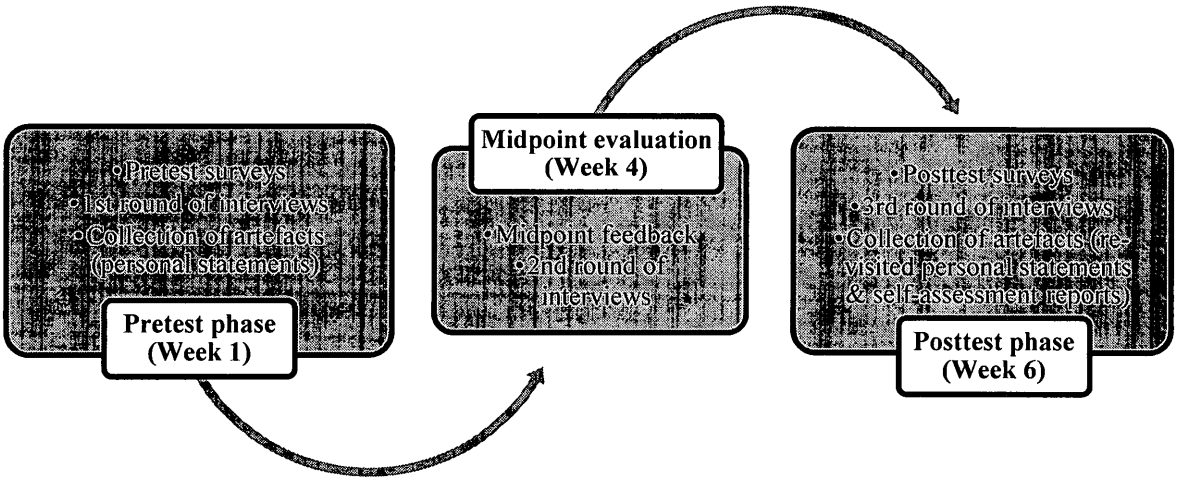

Figure 4. Sequence of data collection events during case study.

In Week One, using a share of class time, the participants were directed to a York University web-based survey system (http://www.yorku.ca/surveys/) to complete a series

of pretest surveys of participants' current perceptions, beliefs, attitudes, and self-assessments regarding web video and particular kinds of Web 2.0 technologies. Next, the interested participants took part in the first round of interviews. I rounded off the pretest phase by collecting students' personal statements about the function of web video in their learning philosophies. Following the pretest administration, the Web Video Project was implemented in the two parallel course sections. Midway through the study, I asked students to provide a brief reflection on their progress, and I conducted a second round of interviews with the selected participants. After the Web Video Project ended, I administered a series of posttest surveys, conducted a third round of interviews, and collected students' re-visited personal statements about the function of web video in their learning philosophies, along with their self-assessment reports on web video mediated learning activities. A detailed timeframe for data collection during fieldwork is given in Appendix D.

3.4 Case Study Sample

The target population for this research was represented by university students enrolled in a graduate-level academic course at a regional university in Alabama. I employed a convenience sampling strategy (Fraenkel & Wallen, 2003) to select participants for the study. The participants were recruited from the total of 26 students registered in the two sections of the "Technology and Education" course in the 2010 spring semester. Given the concern over a modest sample size and the potential risk of attrition of the participants during the course of the study, the researcher, in concert with course instructors, allotted 40 minutes of class time at two points of data collection to

allow the participants to complete a series of surveys. Still, the repeated surveys resulted in some degree of attrition because of participants' failure to complete some of the surveys. In an effort to eliminate incomplete, fragmentary, and biased data, I employed a cross tabulation technique to establish a relationship between the number of eligible participants and the number of actually completed repeated surveys. The intention behind this analysis was two-fold: (a) to determine the actual sample size of the participants, and (b) to identify the circumstances contributing to participants' withdrawal from some of the data collection activities.

As shown in Table 1, one participant withdrew from the course and, subsequently, from the study, due to pregnancy leave. Three participants did not attend class on the research project launch day when pretest survey data was collected. Three other participants, despite being present in class, still refrained from completing more than one of the pre- and posttest surveys. Finally, two participants failed to complete the Web Impact survey carried out on the last day of the study. Therefore, I based my data analysis on a convenience sample of 17 participants (65.4% of total course enrollment) who followed prescribed data collection procedures. The data collected from the nine irregularly contributing participants were discarded.

Table 1

Loss of Participants

Mortality benchmarks	Course section		Total sample
	01	02	
Dropped out (i.e., pregnancy leave)	0	1	1
Absent during pretest data collection	2	1	3
Failed to complete more than one repeated surveys	2	1	3
Failed to complete the posttest-only Impact survey	2	0	2
Total number of missing participants	6	3	9

For the purpose of interviewing, 10 students showed interest in sharing their experience about learning with web video and taking part in a series of three interviews. I sent all the interested students an interview invitation letter via email (Appendix E) in which I described the purpose and the procedure for each stage of the interview process, and the confidentiality of the procedure. Additionally, I devised a schedule by which to arrange each interview so that the students could choose a time slot which was most convenient for them. Based on their availability, only four participants committed to engage in all stages of the interview process. These four participants were then provided with further details regarding the interview location. To maintain the continuity of the interview process, I sent out email reminders to the participants. Regrettably, in the midst of the three-stage interview process one participant had to decline further participation. Therefore, only three participants comprised the sample from which the interview data was collected and analyzed.

In addition, I asked course directors to volunteer to participate in a posttest interview to share their insights about the effectiveness of the Web Video Project and its actual implementation in their courses. The interview was conducted with two instructors on the last day of fieldwork.

3.5 Research Treatment: Web Video Project

3.5.1 Web Video Project Rationale

The Web Video Project was informed by the "Learning with Web Video" Model, discussed in the previous chapter. Provided with ongoing support and highly structured learning activities, students were encouraged to explore and learn about Web 2.0 technology and its use in education by critically examining three sources of knowledge (i.e., scholarly articles, user-created web videos, and previous personal experience), and by utilizing Internet-based applications (i.e., Blogger, video sharing websites, Voki, Xtranormal, screencasting, video conversion tools, etc.) and Microsoft Windows media production technologies (i.e., Paint, Movie Maker, and PowerPoint).

Additionally, the Project was designed in accordance with the ISTE[2] National Educational Technology Standards for Teachers (ISTE, 2008) and the AECT[3] Program Standards for advanced programs in the area of educational communications and instructional technologies (Earle & Persichitte, 2005). These compliances are meant to ensure a student-driven project that prepares K-12 teacher candidates to apply emerging

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[2] ISTE, the International Society for Technology in Education, has developed the flagship standards for learning, teaching, and leading in the digital age. These standards are widely recognized and have been adopted in the U.S. and worldwide.

[3] AECT, the Association for Educational Communications and Technology, has developed recognized standards for U.S. teacher education programs that prepare school media specialists and/or educational technology specialists.

educational technology for learning and teaching. Specific standards germane to the project are as follows:

- ISTE's NETS-T standards (ISTE, 2008):
  - Facilitate and inspire student learning and creativity.
  - Model digital-age work and learning.
  - Promote and model digital citizenship and responsibility.
  - Engage in professional growth and leadership.
- AECT' program standards (Earle & Persichitte, 2005):
  - "Create instructional or professional products using technology resources such as CD-ROMs, laser discs, Web pages, digital technologies, and other emerging technology resources" (p. 37).
  - "Apply research and theory in the selection and utilization of technologies for learning" (p. 39).

3.5.2 Web Video Project Design and Organization

On the first day of the Project, all the students were provided with an electronic version of the Web Video Project Guidelines prepared by the researcher. These guidelines contained a project roadmap, a set of practical guidelines for completing assignments, and self-evaluation rubrics to support students in taking charge of their own learning (see Appendix F). The intention behind the guidelines was to give students a certain degree of flexibility and accountability so that they could bring their unique perspectives to the Project and engage actively in their own learning.

In compliance with the "Technology and Education" course requirements, the Web Video Project covered the immediate instructional technology topics, such as assistive technology, the ethics of Web 2.0, and ePortfolio. To ensure a high standard of course delivery throughout the Project, I collaborated with the course instructors in devising teaching strategies that would work complementarily with the Project. The Project began with a learning scenario addressing the critical appropriation of existing web video content (Weeks 2 through 4), and then smoothly transitioned to another learning scenario entailing the creative production of web video artefacts (Weeks 4 through 6). Each week students engaged in small-group discussions on the previous week's topics, then received instruction on a new topic in the form of a lecture, and finally participated in the Web 2.0 Boot Camp sessions (see Figure 5).

To help students focus on learning rather than on navigating technical issues, a series of hands-on training sessions– entitled *Web 2.0 Boot Camp* – was given during the second part of the class (see Appendix G). Each training session was mandatory and included an intensive sixty-minute lesson designed to help students understand how the Web works, learn through practice the technical processes of web video use and production (e.g., how to create a video-enhanced blog, how to borrow web video, how to make their own videos and put them online), and to acquire other skills relevant to the Project and to their own needs. Applying an on-demand approach, the Boot Camp session included three main components: (a) a presentation on emerging web-based technology and the stages involved in web video production, featuring demonstrations and real-world examples; (b) a short, hands-on exercise to demonstrate how the technology works; and

(c) self-regulated work (either individually or in pairs) on their projects. Students were provided with ongoing, personalized support during the Boot Camp in order to resolve quickly technical issues and to encourage positive attitudes towards technology.

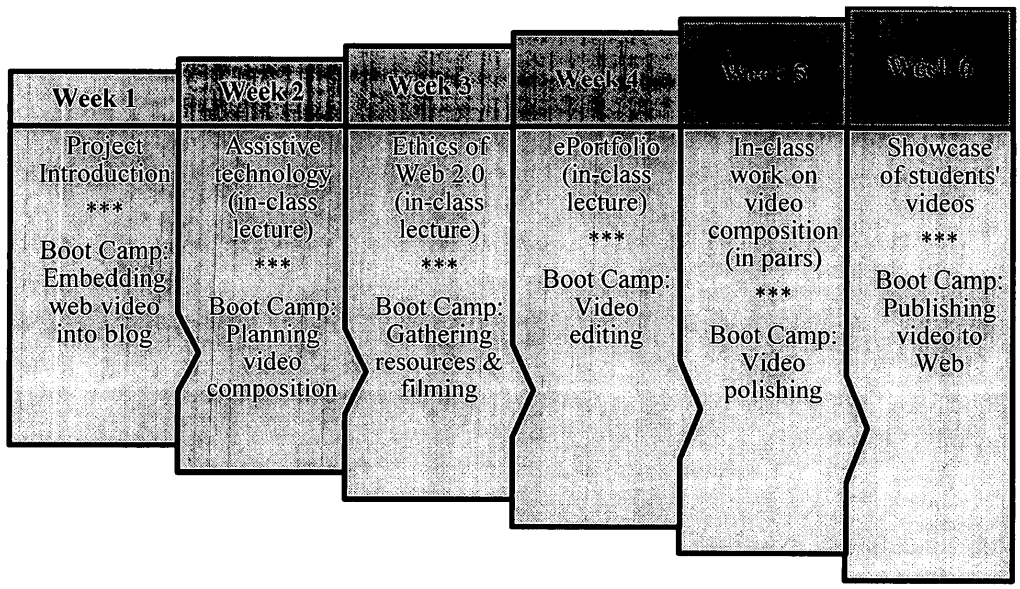

Figure 5. Sequence of learning events during the Web Video Project.

Much attention was given to selecting the technologies used to facilitate student learning in the Web Video Project. Students were primarily introduced to free and easy-to-use Web 2.0 applications; some applications were operating on a "freemium" business model (i.e., one that enables users to try basic versions of the service at no cost, with advanced options available for purchase). In light of the nature of Web 2.0 technologies and free media hosting services such as Blogger and YouTube, students were informed that the ability to ensure their privacy was limited because the content that they uploaded resided on Google corporate databases. At the same time, access to the course portal for

students' blogs, powered by Blogger, was password protected and therefore only accessible to those enrolled in the course. When the Project ended, students retained access to the course portal and its content.

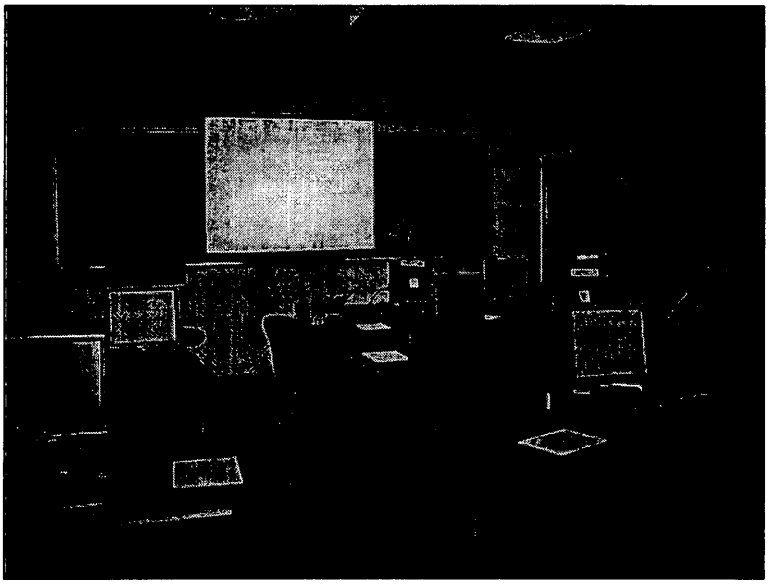

Figure 6. Snapshot of a computer lab used during the Web Video Project.

Throughout the Project, students were provided with easy access to the university computer labs (Figure 4), which were equipped with the most recent Microsoft Windows XP-based desktop computers and high-speed Internet connections. As the Project unfolded, students had opportunity to borrow portable *FlipCam* camcorders at no cost. While students had no restrictions on which video recording hardware they were to use, FlipCam was recommended as an easy-to-use, high-definition digital camcorder suitable for individuals approaching digital video production for the first time.

3.5.3 Web Video Project Assignments

The Web Video Project was comprised of a set of assignments (see Figure 6) that were arranged collaboratively by the researcher and the course directors and then integrated into the "Technology and Education" course syllabus. The course instructors agreed that 30% of the students' final grade would be allotted to the Project's assignments. Students' participation in research activities was optional and was rewarded with an extra credit (i.e., an additional 5 points towards their grade for the Project).

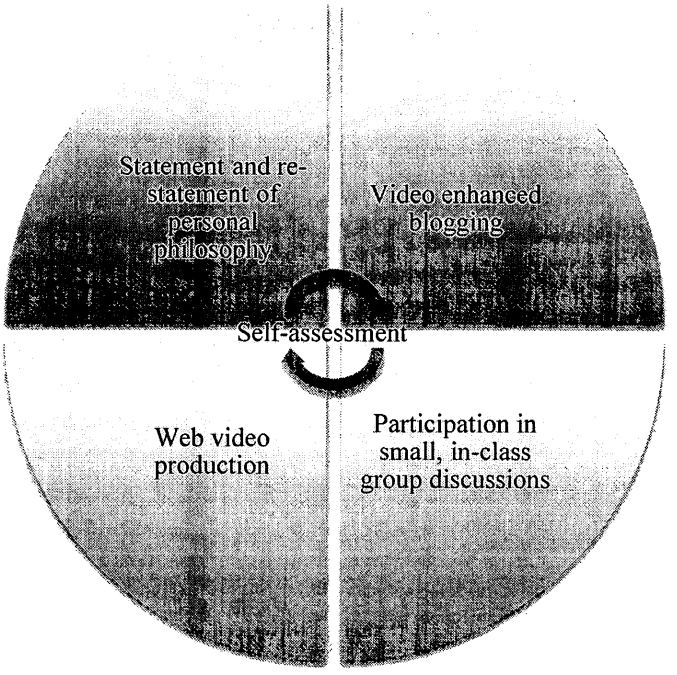

Figure 7. Flow of learning assignments of the Web Video Project.

Statement and re-statement of personal philosophy about the role of web video in learning and teaching[4]. At the beginning of the Project, students were asked to write a statement about their perceptions of the educational potential of web video for themselves as learners and for their future students. Then, at the end of the Project they were asked to revisit their views.

Video-enhanced blogging. As part of a video-enhanced reflection assignment[5], students were asked to find a web video clip (on video sharing networks, such as YouTube) that was both relevant to the weekly readings and meaningful to them, and to bring the self-selected clip into the reflective discussion of the assigned readings. Having selected an appropriate web video, students were asked to incorporate the borrowed video into their blog-mediated reflection and then to discuss how the information displayed in the web video was connected to the concepts embedded in the readings. For their weekly preparations, students were asked to keep a blog accompanied by a relevant web video. The intent of video-enhanced reflection is to help students make connections between what they have read and acquired during the lecture, their reflection on the relevant web video they have selected, and their prior knowledge of the subject matter.

Before blogging, students were expected to read the assigned material in a critical manner and then to search the YouTube video sharing website for user-created web video that spoke to the concepts discussed in the reading. In their blogging, students were asked

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[4] This approach is a revision of a course assignment which the researcher came across when taking the graduate course at the Ontario Institute for Studies in Education of the University of Toronto in 2008-09 academic course.

[5] This approach is a revision of a critical reflection journal assignment which the researcher came across when taking a graduate course in the Graduate Program in Education at York University in 2007-08 academic course.

not to use enterprise videos with copyright restrictions produced by media companies. Before composing a video-enhanced blog entry (at least one entry a week), students were asked to prepare the following elements: (a) a summary of the reading material, (b) a personal reflection, (c) a relevant video embedded into their reflection and the rationale for using it, and (d) a thought-provoking question that would be used for in-class group discussions. With the understanding that blogging is a means to connect with others in an online media landscape, participating students were expected to comment on their peers' blog entries in a constructive way.

Participation in small, in-class group discussions. Before the new lecture was presented to students, they were engaged in collaborative discussions. Students formed small groups for discussing the assigned scholarly articles, along with pertinent user-created web videos, using the related thought-provoking questions they posted on their own blogs prior to the class. The active engagement of every student in small-group discussions was encouraged.

Web video production. In this activity, students engaged in the composition of their own video narratives that reflected their understanding of the assigned topic (i.e., assistive technology). This activity involved a number of tasks, such as designing, filming, collecting materials, scriptwriting, editing the digital video composition, and publishing it to the Web. The digital video artefact was expected to have a purposeful narrative and an attractive look, incorporating multiple modes of representation – pictures or graphics, video fragments borrowed from an existing amateur web video, authentic video footage, audio, and text. Optionally, students were encouraged to integrate

speaking avatars or animations to add a lively and engaging feel to their videos by using the *Voki* and/or *Xtranormal* websites. The web video production process consisted of the following stages: (a) selecting a topic; (b) scripting the design; (c) collecting one's own video footage, re-using other videos, and creating digital animations; (d) editing one's own video compositions using Microsoft Windows MovieMaker video-editing software; (e) publishing one's digital video creations to YouTube and then embedding them into one's own blog.

Self-assessment of web video mediated learning. As active participants, students were asked for their input in developing the scoring rubrics for the video-enhanced blogging and web video production activities. Such rubrics were used as guidelines to carry out a holistic analysis of student performance and to prevent students from getting lost in the new experience and course expectations. Upon completion of the Project, students evaluated their own learning and final products (e.g., video-enhanced blog and web video) using the co-developed evaluation rubrics.

3.6 Data Collection Instruments

Multiple sources of evidence were collected from repeated surveys, interviews, and participants' learning artefacts. Details of these procedures are given in the next three subsections.

3.6.1 Survey Method

Substantial quantifiable data was derived from a series of self-completion surveys which relied on participants' opinions and evaluations of their own perceptions and experiences (Sapsford, 1999). They included: (a) the pretest Background Survey; (b) the

pre- and posttest Concerns and Levels of Use Survey; (c) the pre- and posttest Web Video Affordances and Constraints Survey; and (d) the posttest Web Video Impact Survey. All the surveys were executed using a York University web-based survey system (http://www.yorku.ca/surveys/). Access to surveys and the associated data were password protected in order to ensure confidentiality.

Background Survey. This survey was developed by the researcher and administered prior to the implementation of the Project. The purpose of this survey was to collect demographic data about the participants and to evaluate the current level of their Internet and Web 2.0 use. This survey was based on items drawn from: the *YouTube Questionnaire* (Kelsen, 2009), the *ELI Student Questionnaire* (ELI, n.d.), the *Technology Preference Questionnaire* (Saeed, Yang, & Sinnappan, 2009), and the *ICT and E-Learning Survey* (Crawley, 2008). Some questions and statements were adapted from the existing surveys, while others were developed by the researcher. As a result, the Background survey consisted of five sections: (a) participants' personal profiles, (b) participants' experience with technology in university classrooms, (c) participants' assessments of their own Internet and Web 2.0 technology skills, (d) participants' personal use of web video, and (e) a request to participate in a three-stage interview (see Appendix H).

The intent of the first section was to solicit strictly factual, demographic data (i.e., gender, age group, educational background, level of teaching experience) in order to give an accurate account of the students participating in the study. Sections B and D were designed to gauge participants' previous experience with particular kinds of Web 2.0

technologies in both academic and informal learning environments. In this section, participants' answers to Questions 9, 10, and 14 were measured indirectly using indicators of frequency of use of video and Web 2.0 technologies, preference for Web 2.0 mediated activities, and frequency of use of user-created web video. Section C sought to measure participants' perceptions of their own Internet and Web 2.0 skills prior to the Project. The inquiries in this section were repeated in the posttest Web Video Impact survey in order to compare participants' self-reported proficiency in Internet and Web 2.0 skills before and after the Project. Finally, the last section asked participants to indicate whether they wished to participate in a three-stage interview. If they agreed, they were then asked to provide their email address so that the researcher could contact them with further details.

Web Video Concerns and Levels of Use Survey. This survey was adapted by the researcher from previously validated measuring instruments – the *Stages of Concern Questionnaire* (SoCQ; Hall et al., 1977) and the *Levels of Use interview protocol* (LoU; Hall & Loucks, 1977) – developed within the Concerns-Based Adoption Model (CBAM). These data collection tools have been used previously by researchers to evaluate changes in teachers' reactions to the adoption of instructional innovations in educational technology (Dobbs, 2005; Ertmer et al., 2002; Liu et al., 2004). One of the strengths of these tools is that the survey items can be adapted and applied to any educational innovation, preserving the factor structure. For the purpose of this study, I used these two data collection instruments to assess changes in participants' understanding of and

competence with web video in the Web Video Project, and to explore the rates at which they adopted web video for learning.

The survey was made up of two sections: (a) participants' concerns about web video and (b) their levels of web video use (Appendix I). The first section included thirty-five statements to gauge participants' concerns about the use of web video for learning and teaching. The evaluation of participants' concerns was based on the SoC conceptual construct representing a developmental cycle of the individual's knowledge needs, motivations, thoughts, and attitudes when challenged with an innovation (Anderson, 1997; Hall et al., 1977). The original SoC questionnaire items were modified to reflect the study's focus on web video technology. They consisted of five statements, not placed in consecutive order in the survey, each of which corresponded to one of the seven stages of concern about the use of web video in learning and teaching (see Figure 8).

Due to the reliability of the instrument, the SoCQ has been used extensively in recent research studies on concerns about the use of technology in education. In particular, a group of researchers (Liu & Huang, 2005; Dobbs, 2005) reported internal consistency of responses to individual survey items with Cronbach's alpha coefficients, ranging from 0.64 to 0.83 with six of the seven coefficients being above 0.70. Other researchers (Bailey & Palsha, 1992; Cheung, Hattie, & Ng, 2001) indicated a moderate reliability of the SoCQ survey. Cheung et al. (2001) suggested the exclusion of six survey items (Q23, Q6, Q7, Q1, Q5, and Q2 in the original version of the SoCQ), since they found that their correlation coefficients were less than 0.40.

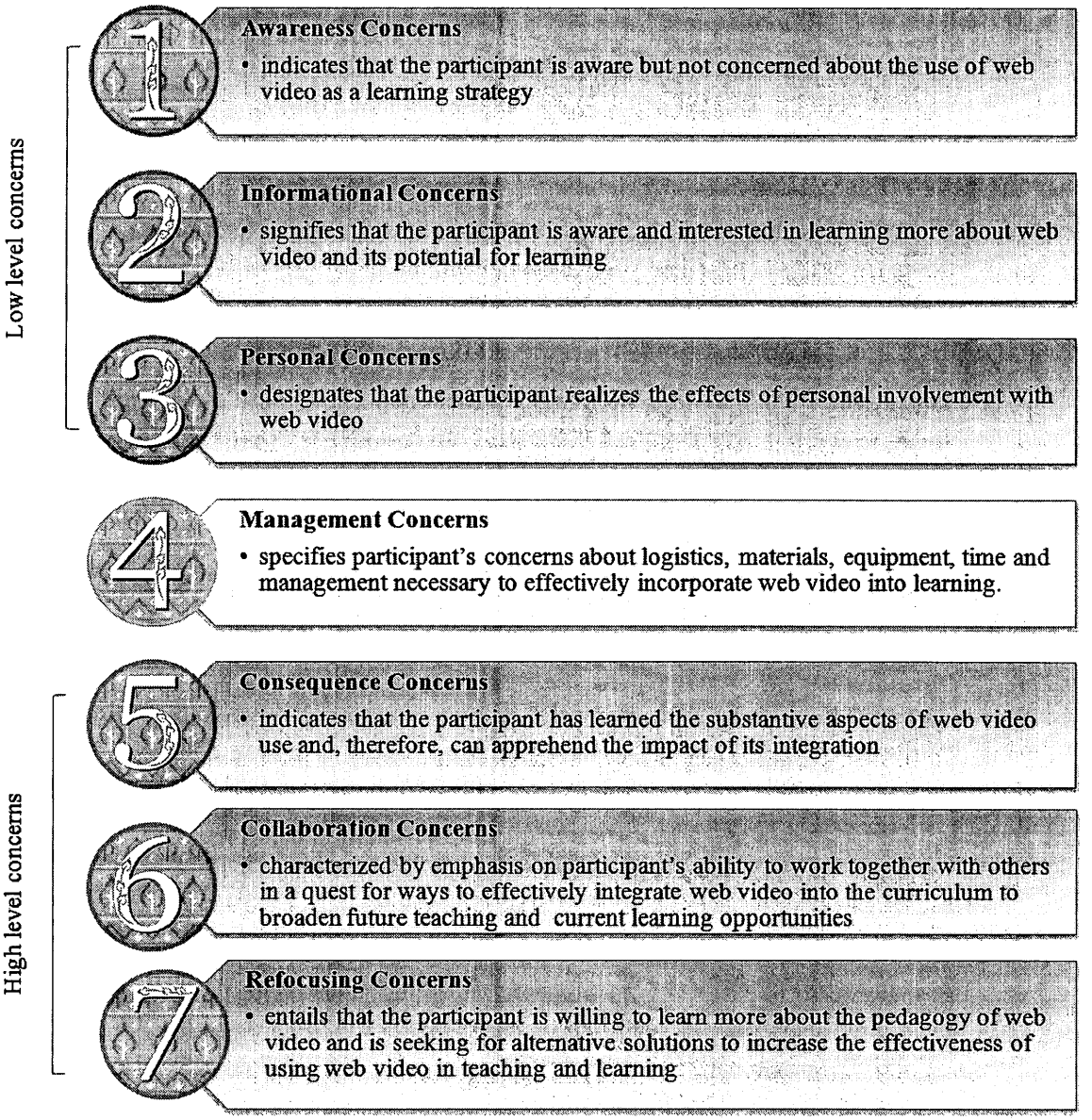

Figure 8. Stages of concern descriptors with the regard to web video (Anderson, 1997; Hall et al., 1977).

The purpose of the second section was to examine the differences in participants' self-reported levels of use of web video in their learning. The participants were asked to identify their current levels of adoption of web video in their learning: nonuse,

orientation, preparation, mechanical use, routine, refinement, integration, or renewal. The response choices in this survey adapted the LoU descriptors developed by Hall and Loucks (1977) by rephrasing statements with regard to web video use and production (see Figure 9).

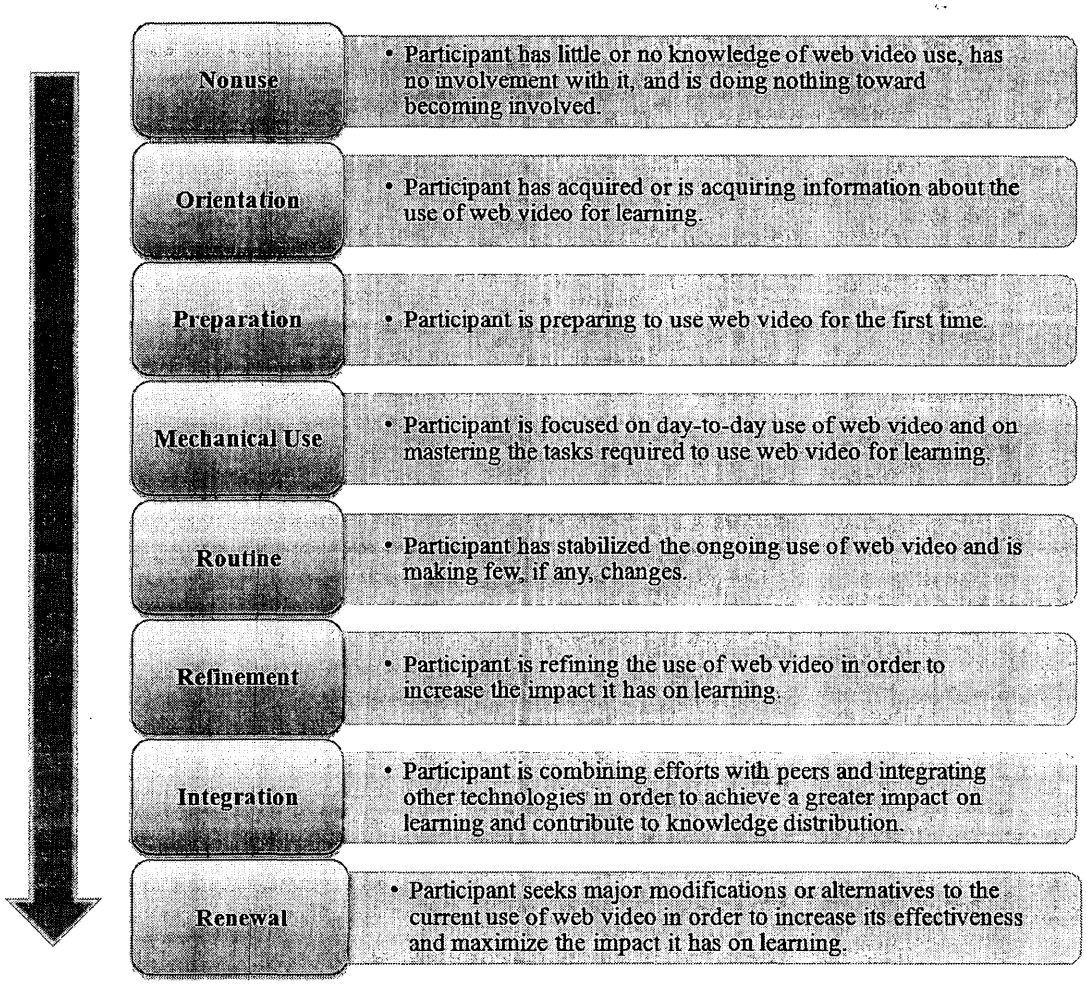

Figure 9. Levels of use of the innovation with the regard to web video. Adapted from "A Developmental Model for Determining Whether the Treatment is Actually Implemented," by G. E. Hall and S. F. Loucks, 1977, *American Educational Research Journal, 14*, p. 266-267.

In the concerns section of the survey, the participants were asked to read each statement and to rate it in terms of their current concerns about their involvement or potential involvement with the integration of web video into their learning. Each statement was followed by an 8-point Likert-type scale with values ranging from 0 (*not true of me now*) to 7 (*very true of me now*). In the second section, the participants were asked to select from eight descriptions which best reflected where they currently felt themselves to be in the adoption of web video for their learning. The survey took an estimated 15 to 20 minutes to complete.

Web Video Affordances and Constraints Survey. This survey was developed by the researcher and administered before and after the Project. The purpose of this survey was to explore the factors that participants perceived as impelling and/or impeding their use of web video to support their learning. Survey questions and statements were adapted from existing surveys: the *Student Information Technology Survey* (University System of Georgia, 2006); the *E-learning Video: Global Navigation Satellite Systems Questionnaire* (McGovern, Martin, & Moore, 2008); the *Online Learning/Distance Education Questionnaire* (Concordia University, 2003); the *YouTube Questionnaire* (Kelsen, 2009); and the *Attitudes to Technology in Mathematics Learning Questionnaire* (Fogarty, Cretchley, Harman, Ellerton, & Konki, 2001). The resulting survey included two sections: (a) barriers, constraints, and challenges; and (b) motivations, affordances, and benefits (see Appendix J). The first section on "constraints" was used to explore participants' anticipated and actual perceptions of the constraints of web video mediated learning. In particular, they were asked to estimate potential barriers, such as the lack of

prerequisite skills, video sharing platform constraints, a shortage of web video searching skills, the lack of conceptual understanding of web video, and learning challenges (i.e., time constraints, a lack of instructional support, and a lack of motivation). In particular, the "constraints" section of the survey included five categories of challenges that students perceived as accompanying the use of web video for learning: (a) the lack of prerequisite skills (survey items 20 and 22); (b) web video technology constraints (survey items 9 through 13); (c) a shortage of web video searching skills (survey items 2 through 8); (d) the lack of conceptual understanding of web video (survey items 14, 15, 17, 18); and (e) learning challenges – time constraints (survey items 16, 25), lack of instructional support (survey items 19, 24), and lack of motivation (survey items 21, 23).

The second section on "affordances" was used to explore the affordances of web video for learning and to measure participants' perceptions of the benefits of web video integration, such as opportunities for content contextualization, opportunities for student-driven learning, and impact on student achievement. The "affordances" section of the survey included five groups of variables: (a) students' perceptions of the importance of emergent Web 2.0 technologies for their learning (survey question 27); (b) students' perceptions of web video attributes for learning (survey items 29 through 33); (c) students' perceptions about the opportunities afforded by web video for content contextualization (survey items 37 through 42); (d) students' perceptions about the opportunities afforded by web video for student-driven learning (survey items 35, 36, 43, 44, 45, and 46); and (e) students' perceptions about the impact of web video on their achievement (survey item 34).

Participants were asked to rate their perceptions using a 5-point Likert-type scale, where the possible responses were *strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree*. Additionally, open-ended questions were intermittently integrated into the survey in order to provide the participants with an opportunity to describe in their own words what they like and dislike about the integration of web video into learning (survey questions 1 and 28), as well as to elaborate on their choices of constraints and affordances of web video use during the Project (survey questions 26 and 47).

Web Video Impact Survey. This survey was developed by the researcher and administered after completion of the Project. The purpose of this survey was to observe the impact of web video use on student learning within the Web Video Project, as well as to give insight into the students' learning as they engaged in two web video mediated learning scenarios – video-enhanced blogging and web video production. This survey was based on items drawn from the existing surveys: the *Student Information Technology Use and Skills in Higher Education Questionnaire* (ECAR, 2005); the *Student Experience with Podcasts for Learning: End of Semester Evaluation* (IMPALA, n.d.); the *Survey of Teachers' Attitudes Toward Computers* (Knezek & Christensen, 1997); and two student surveys derived from two studies on the impact of learning technology (Davies, Lavin, & Korte, 2009; Ertmer, Gedik, Richardson, & Newby, 2008).

The survey included five sections: (a) students' self-assessment of Internet and Web 2.0 technology skills, (b) students' perceptions of video-enhanced blogging activity, (c) students' perceptions of web video production activity, (d) students' perceptions of

web video mediated learning, and (e) students' overall satisfaction with the Project (see Appendix K). The survey statements, most of which were based on a 5-point Likert scale, were selected to prompt the participants to describe and explain their reactions towards learning with web video before, during, and after the implementation of the Project. In addition, the participants were asked to provide their opinions on the future direction of the use of web video in teaching and learning. Participants' responses to open-ended essay questions were used to help clarify aspects related to the impact of the use of web video on learning.

Midpoint Survey. This brief survey was developed by the researcher and administered at the midpoint of the Project. The purpose of this survey was to collect participants' feedback on their current progress in this Project. Specifically, the participants were asked four open-ended questions regarding (a) their current perceptions about the Project and whether their expectations were met, (b) aspects of the Project they found encouraging and motivating, (c) problems and challenges they experienced since the Project launch, and (d) changes they thought this Project needed (see Appendix L).

3.6.2 Interviewing

To gain more in-depth insight, I conducted semi-structured individual interviews with each participant who agreed to the interview process. The interviews were conducted at three points: at the beginning of the Project, in the middle of the Project, and upon completion of the Project. The purpose of the interviewing in this study was to capture and understand the participants' individual perceptions of web video use and production. The three-interview structure (Seidman, 2006) was used to gauge

participants' subjective experiences of the integration of web video before, in the process of, and after the implementation of the research treatment.

This interview technique was found to be preferable because it allowed for flexibility in conversation with participants, enabling them to identify the important issues in their particular experiences with web video use and production. These interviews took place on campus, in a designated classroom, at the convenience of the student. Each of the three interviews lasted 35 minutes. The interviews were separated by a two-week period in order to give the participants time to reflect further on the experiences that ensued between each interview. The interview protocol was designed around a list of proposed questions for each interview that did not necessarily determine the order of communication during the interview process (see Appendix M).

All interviews were digitally recorded and then transcribed solely for the purpose of interpretation. Participants' names were kept strictly confidential. In the transcription process, each interviewee was assigned an individual code so that participants' names were not associated with the results of the study in any way. Digital audio recordings were permanently deleted from the digital audio recorder when the process of transcribing was completed.

Following the logic of the three-interview structure, the purpose of the first interview was to understand the participants' prior experiences with web video at the beginning of the Web Video Project. I was interested in the conditions that had affected participants' prior use of web video: what kind of web video and video sharing communities they had used and how they had used them, what search strategies for web

video they had applied, and whether they had had frustrating experiences with web videos.

During a second interview, I focused on the participants' experiences with web video during the activities offered through the Web Video Project. The participants were asked about their own experiences of using web video, what they did during self-paced active learning, how they interacted with digital information in multimodal formats, and how web video influenced their social learning when they engaged in collaborative in-class discussions.

In the third interview, the participants were encouraged to reflect on the meaning of their experience with web video mediated learning and what they had learned from that experience. The questions helped the participants reflect on their own sense of the value of web video use and production in their learning process. As future teachers, the participants were asked about how the experience they had had with web video during the course of study would affect their future learning and teaching.

Interview with instructors. Upon completion of the study, a 30-minute interview was conducted simultaneously with both instructors of the Technology and Education course. The purpose of the interview was to gain insights into the instructors' teaching experiences, to assess their changing pedagogical beliefs about web video mediated learning, and to gauge their attitudes towards the use of Web 2.0 (particularly user-created web video) in classroom-based university-level teaching. During the interview, I asked instructors about their perceptions of the Project, their opinions about Web 2.0

technologies and web video in particular, and their plans to use web video in their future teaching (see Appendix N).

3.6.3 Collection of Artefacts: Personal Statements and Self-Assessment Reports

In addition to interviewing, I collected two types of learning artefacts submitted by participants as part of the course requirements: (a) repeated (i.e., pre- and post-treatment) personal statements about the use of web video in current learning and future teaching, and (b) self-assessment reports of video-enhanced blogging and web video production learning activities. The purpose of collecting participants' artefacts was two-fold: (a) to elicit multiple accounts of their perceptions of the Project and its impact on their learning, and (b) to gather information about new aspects of web video mediated learning that might emerge from the analysis of these accounts.

Students were required to submit two personal statements about the role of web video in their own learning and in their future teaching philosophies before and after the Web Video Project implementation. The second, revised version was meant to determine whether students' beliefs regarding the use of web video had changed. The participants were asked to reflect on the following items: (a) what they currently thought of the use of web video for themselves as learners and for their students as future teachers; (b) why they held those opinions, both in relation to themselves and to their students; (c) what role knowledge played in their learning; and (d) what role social media, including user-created web video, played in their knowledge construction and thinking.

Other artefacts used for analysis were students' self-assessment reports of web video mediated learning activities, which were based on the scoring rubrics. Those

reports were analyzed in order to determine the role of web video in facilitating students' learning and to explore whether their learning expectations were met after the Project was completed.

3.7 Data Analysis Strategy

To ensure the validity of the findings, multiple data sources were collected, including survey responses, interview transcripts, and students' learning artefacts. The confidentiality of the data collected was maintained by assigning a code to each individual survey dataset, interview transcript, and learning artefact.

For the purpose of statistical analysis, the quantifiable data collected was subject to both descriptive and inferential test statistics. I used the Statistical Package for the Social Sciences for Windows 18 to compute quantitative data analysis. The statistical data analyses involved:

- the computation of the observed frequency distributions, means, and standard deviations in order to provide insight into students' behavioural learning patterns and answer the research questions; and
- the repeated-measures analysis of variance in order to examine the differences between the pre- and posttest conditions of the research treatment, as well as to test statistically the research hypotheses.

I performed univariate analysis of variance (ANOVA) on repeated-measures data collected from the pre- and posttest surveys. The univariate approach does not violate the assumption of sphericity, meaning that the relationships between pre- and posttest conditions are fairly similar (Field, 2009). In contrast to the multivariate approach, the

univariate approach is considered more powerful in studies with a smaller sample size and two treatment conditions, such as this study (Maxwell & Delaney, 2003; Stevens, 2002). To control the Type I error rate, particularly with a moderate sample size, the Bonferroni test statistic was used as a post-hoc technique in the ANOVA repeated-measures procedure (Maxwell, 1980). In some cases, a multivariate approach to a repeated-measures procedure (MANOVA) was also used to examine variations of sample means for measures as a group. Pillai's trace (V) was used as one of the four MANOVA test statistics in the data analysis because this test statistics is assumed to be relatively powerful and robust to violations of assumption of multivariate normality when sample sizes of participants are equal , such as in this study (Bray & Maxwell, 1985; Field, 2009).

Prior to statistical analysis, I conducted a data screening procedure to verify inconsistent scores by comparing them to original datasets (Meyers, Gamst, & Guarino, 2006). Due to the loss of nine participants, a few cases of missing data were detected, which resulted in a slight difference in participation rates for different groups of surveys. The discarded cases of the data did not influence the major objectives of statistical analysis.

To achieve greater refinement in data analysis and to make the meaning of the findings more evident, I complemented statistical analysis with illustrative examples of qualitative data. This type of data allowed me to uncover unexpected issues and concepts from the participants' perspectives, including differences and commonalities in their learning experiences, which were not reflected by the closed-form surveys (Kaczynski,

Wood, & Harding, 2008). The transcribed data were managed and analyzed using Microsoft Word and its Reviewing Pane (e.g., Comment and Find features). The "comments" feature allowed me to attach codes to the frequent occurrences of thematic fragments of participants' responses (i.e., *thematic units*) in the transcripts, and the "find" feature enabled me to collate all the instances of specific codes, words, and phrases.

The types of codes and patterns of similar responses were analyzed for trends and themes. Cumulative frequencies of thematic units found in the domain categories were calculated and presented in the form of percentage distribution of all responses related to a specific category. I have used direct quotes from the interview transcripts and learning artefacts to allow for a richer interpretation of the participants' learning experience. In the data analysis, I have also used feedback given by instructors during the course of the study and a posttest interview in order to provide a richer narrative.

In the discussion of the research results, I used a triangulation method to connect qualitative and quantitative data collected at different points in time and in several different settings in order to corroborate the findings about the impact of web video on student learning and to provide stronger direction for the optimal use of web video in designing a university-level course (Miles & Huberman, 2004). In addition, data triangulation was instrumental in enhancing the trustworthiness of the findings and minimizing the effect of bias and random error in a study with such a small sample of participants (Creswell, 1994).

3.8 Chapter Summary

The purpose of this study was to explore the application of the "Learning with Web Video Model" in the context of a graduate-level university course. Two learning scenarios of the Model were under investigation: the critical appropriation of user-created web video content in the form of video-enhanced blogging and the creative production of students' own web video artefacts. Based on the Model, the researcher designed the Web Video Project that acted as research treatment for the study. Operating in a mixed-method paradigm, the researcher conducted a series of pre- and posttest surveys, carried out semi-structured interviews, and collected participants' learning artefacts in order to complement the survey data with subjective reflections on web video use and production from a student's perspective. Analysis of data included descriptive statistical analysis (such as frequency distributions, means, and standard deviations) and the univariate repeated-measure procedure. Furthermore, statistical analysis was complemented with the data derived from qualitative analysis (such as frequent occurrences of thematic fragments of participants' responses) and illustrative examples of qualitative data.

CHAPTER FOUR: RESULTS

This chapter reviews the results of statistics and data analyses performed on data collected from a series of pre-post surveys, interview transcripts, and learning artefacts produced by participants during the study. I start this chapter by describing the sample of participants who underwent the research treatment, also referred to as the Web Video Project, and followed the prescribed data collection procedures. In particular, I report on participants' major demographic characteristics – their academic field and level of education – and research-specific attributes, such as participants' previous academic experience with web-based technology and their prior enrollment in technology-related or mediated courses. In the following sections, I report the results of the research treatment, which are aligned with corresponding research questions and related hypotheses. I conclude this chapter by summarizing the empirical evidence I have discovered in this study.

4.1 Participants' Background

The sample of the case study included 17 participants; seven (41.2%) were male and 10 (58.8%) were female. Half of the sample (52.9%) was under 30 years old; about one third of the participants belonged to a 30 to 45 year-old group; three participants (17.6%) were over 45. The gender and age proportions within the sample concur with the demographic characteristics of a typical class of master's students in education at the participating university. The majority of participants (76.5%) indicated that they were working on their first graduate degree; on average, the participants reported that they had studied at the university for 6 to 7 years ($M = 6.35$, $SD = 3.14$), with an outlier who spent

17 years as a student. Ten participants (58.8%) had prior teaching experience, ranging from 1 to 11 years ($M = 2.94$, $SD = 3.87$). With one exception, no participant had previously taken a course enhanced with user-created web video. See Table 2 for a summary of participants' background information.

Table 2

Frequencies for Participants' Background Characteristics

Characteristic	*f* (%)
Gender	
Male	7 (41.2)
Female	10 (58.8)
Generation	
Baby Boomers (over 45)	3 (17.6)
Generation X (30 to 45)	5 (29.4)
Generation Y (under 30)	9 (52.9)
Academic Fields	
Elementary Education	6 (35.3)
Language Arts	1 (5.9)
P.E.	1 (5.9)
Maths/Science	2 (11.8)
Special Education	1 (5.9)
Others	6 (35.3)
Previous participation in an instructional technology course	
Yes	8 (47.1)
No	9 (52.9)
Previous participation in an online course	
Yes	8 (47.1)
No	9 (52.9)

Prior to the implementation of the Web Video Project, most of the participants exhibited low interest in using Web 2.0 technologies for their learning (Table 3). The

analysis of the background survey indicated that the participants had low preference for Web 2.0 mediated activities, as measured on a 5-point Likert scale. Blogging and web video watching had the highest mean preference score (with standard deviations in parentheses) among other web video mediated activities: 2.29 (1.16) and 2.24 (1.39), respectively. This observation suggests that participants may have favoured blogging and web video viewing over digital media production, such as the creation of audio podcasts and the production of web video, or that they were more familiar with those technologies.

Table 3

Descriptive Analysis for Web 2.0 Mediated Learning Preferences

Measures	*M (SD)*	Least preferred	(%)			Most preferred
		1	2	3	4	5
Blogging	2.29 (1.16)	29.4	35.3	11.8	23.5	0.0
Watching user-created web video	2.24 (1.39)	41.2	23.5	17.6	5.9	11.8
Listening to an audio podcast	2.12 (1.11)	35.3	35.3	11.8	17.6	0.0
Embedding web video into blog	2.12 (1.17)	35.3	41.2	0.0	23.5	0.0
Commenting on other people's blogs	2.18 (1.24)	35.3	35.3	11.8	11.8	5.9
Creating an audio podcast	1.94 (1.09)	41.2	41.2	0.0	17.6	0.0
Producing a web video	2.00 (1.12)	41.2	35.3	5.9	17.6	0.0

To determine the extent to which the participants had been previously exposed in a university classroom to Web 2.0 and associated technologies for capturing still photographs and video, they were asked, "How often does your instructor use the

following technologies as part of course instruction?" Three (17.6%) participants indicated that they had been exposed to blogs, and only two participants indicated that they had been exposed to other Web 2.0 technologies (such as social bookmarks, social networks, and wiki) on a regular basis. The pretest survey responses showed that the overwhelming majority of the participants were rarely or never engaged in Web 2.0 mediated learning activities as part of formal course curricula. In particular, most participants, ranging from eight (47.1%) to eleven (64.7%), claimed that instructors did not adopt Web 2.0 technologies (e.g., social networks, blogs, social bookmarks, video sharing websites) or mobile devices in their instruction. Wiki was the Web 2.0 technology with the highest average score among the other Web 2.0 technologies used in the classroom.

4.2 Research Question One: Changes in Concerns about Web Video

RQ1: How do students' concerns about web video evolve over the period of the Web Video Project?

H_1: As students progress through the Project, their low-level concerns about web video will subside, while high-level concerns will increase.

To answer the stated research question and test the hypothesis, I performed statistical analyses on data collected from the *Web Video Concerns and Levels of Use* survey that was administered before and after implementation of the research treatment. The survey included two parts, Stages of Concern (SoC) and Levels of Use (LoU). Only 15 participants (57.7% response rate) completed the pre- and posttest surveys.

Participants' stages of concern about web video. The SoC part of the survey asked participants to read each statement and rate it in terms of their current concerns about their involvement or potential involvement with the integration of web video into their learning. Each survey item was rated by participants using an 8-point Likert-type scale with values ranging from 0 (*irrelevant to me*) to 7 (*very true of me now*). The collected data were analyzed using both descriptive statistics and repeated-measures multivariate analysis of variance in order to develop students' concerns profiles and to explore patterns and themes associated with each stage of concerns affected by the research treatment. Hall et al. (1977) advised that the raw data represent an aggregated score that is derived from totalling the responses given to five statements associated with each of the seven stages of concern (see Figure 8). The concerns profile in this study presents the participants' mean scores for each concern stage.

Analysis of pretest participants' concerns scores showed that the means in the awareness stage of concern were the lowest on the scale, followed by management and refocusing concerns. The most intense stages of concerns about web video among the participants were informational, personal, consequence, and collaboration concerns (see Table 4).

Table 4

Pre-Post Mean and Standard Deviation for Stages of Concern

Stages of Concern	Pretest *M* (*SD*)	Posttest *M* (*SD*)
Awareness	13.53 (5.62)	9.73 (6.31)
Informational	25.53 (5.15)	22.60 (6.02)
Personal	21.93 (6.02)	21.73 (7.99)
Management	17.87 (7.12)	16.87 (4.88)
Consequence	21.07 (8.03)	21.47 (9.04)
Collaboration	21.13 (7.36)	23.07 (10.26)
Refocusing	19.40 (6.38)	20.60 (7.57)

These pretest findings are not quite consistent with the idealized SoC hypothesis, which states that participants who are about to learn a new innovation tend to "have higher awareness, informational, and personal concerns than management and consequence concerns" (Anderson, 1997). The low intensity of awareness and management concerns suggests that the participants had either had previous exposure to web video or had some prior knowledge of it. The finding might also suggest that students' attention was preoccupied with other things, in addition to their anxieties about web video use and production. The high intensity of informational and personal concerns, which is aligned with the SoC hypothesis, suggests that the participants were interested in learning more about how web video would benefit their learning, but at the same time they may have been anxious about the impact of their participation in the Web Video Project on the organization of their study, and about the potential personal costs (e.g. time and energy commitments) that would be involved. Interestingly enough, participants indicated a considerably high intensity of "impact" concerns, such as consequence and collaboration. This finding suggests that some of them were initially interested in

learning more about how web video could enhance their learning and facilitate interaction with other students.

Upon completion of the Project, the intensity of awareness (ΔM = -3.80), informational (ΔM = -2.93), and management (ΔM = -1.00) concerns decreased, suggesting that participants' knowledge of web video expanded, and that they appeared to be able to manage their time and regulate their web video mediated activities (Table 5).

Table 5

Post-Pre Mean Pairwise Comparisons for Stages of Concern

Stages of Concern	ΔM (Post-Pre)	*SEM*	p^a
Awareness	-3.80*	1.74	.046
Informational	-2.93	1.41	.057
Personal	-.20	1.49	.895
Management	-1.00	1.40	.487
Consequence	.40	1.50	.794
Collaboration	1.93	1.55	.233
Refocusing	1.20	1.89	.535

Note. Based on estimated marginal means.

*The mean difference is significant at the .05level.

[a]Adjustment for multiple comparisons: Bonferroni.

This finding might be attributed to students' active participation in hands-on training sessions (i.e., Web 2.0 Boot Camp) and to the ongoing technical support provided throughout the Project. The pattern of the posttest concerns profile remained stable in relation to personal concerns about web video, suggesting that some participants felt uncertain about the appropriateness of using web video in learning since it required additional personal commitments (such as time pressure) and study reorganization.

Supporting the initial SoC theory (Hall et al., 1977; Hall & Loucks, 1977), the posttest findings show the increasing intensity of high-level impact concerns, including collaboration ($\Delta M = 1.93$), refocusing ($\Delta M = 1.20$), and consequence ($\Delta M = .40$) concerns. Overall, the comparison of the pre- and posttest means indicated an observable change from decreasing low stages of concerns about web video use to slightly increasing higher stages of concerns (see Figure 10).

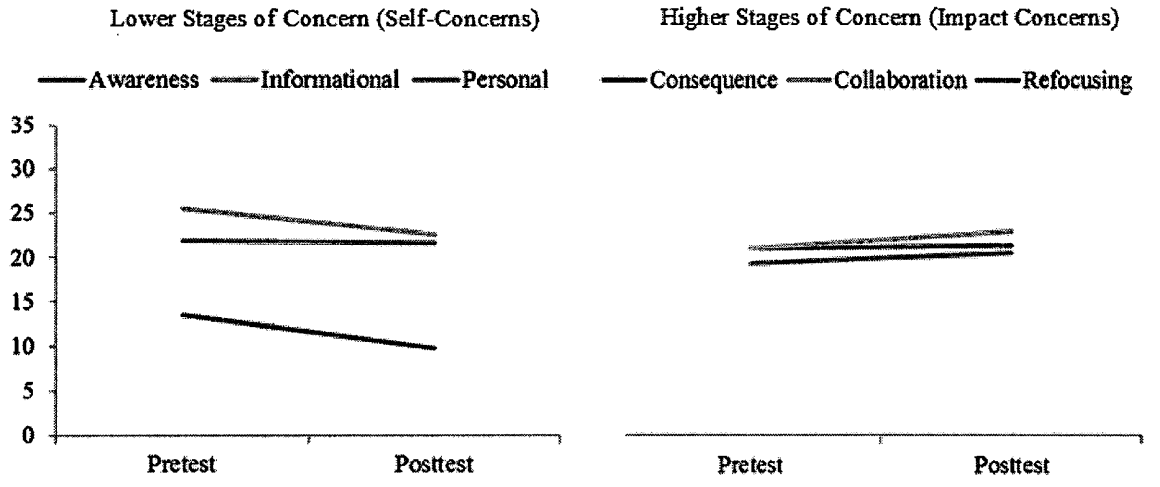

Figure 10. Comparison of pretest-posttest sample profiles of lower and higher stages of concern. Mean stages of concern scores obtained during pre- and posttest survey administration.

Using repeated-measures ANOVAs on the aggregated scores for each concern stage revealed one significant treatment effect on the stage of awareness concerns, $F(1, 14) = 4.78$, $MSE = 108.30$, $p = .046$, $\eta = .26$, suggesting that the differences among the mean scores for the awareness stage of concern may have been attributable to the Web

Video Project (Table 6). Similarly, using Pillai's Trace, repeated-measures MANOVA analysis revealed no significant effect of the Web Video Project on the Stages of Concerns, $V = .67$, $F(1, 14) = 2.29$, $p = .134$.

Table 6

Repeated-Measures ANOVA for Stages of Concern

Stages of Concern	*F*	*p*	ŋ
Awareness	4.78	.046	.26
Informational	4.31	.057	.24
Personal	.02	.895	.00
Management	.51	.487	.04
Consequence	.07	.794	.01
Collaboration	1.55	.233	.10
Refocusing	.41	.535	.41

Additionally, separate univariate ANOVAs on the 35 outcome variables revealed significant differences between the pre- and posttest means for four statements associated with four different stages of concern, such as informational, management, collaboration, and refocusing concerns. These findings support the assumptions made earlier about the pre-post changes. Hence, a significant change in the means for Statement 35, $F(1, 14) = 5.04$, $MSE = 2.91$, $p = .041$, $\eta = .27$, suggests that the participants' concerns about managing time while working with web video may be decreased by the end of the Project. Similarly, a significant change in the means for Statement 16, $F(1, 14) = 5.83$, $MSE = 1.29$, $p = .030$, $\eta = .29$, suggests that the participants' needs for information about web video use may have been decreased as the result of the Project. However, significant

changes in the means for Statements 6 (one of the collaboration concerns) and 23 (one of the refocusing concerns) indicate that participants may not have been willing yet to relate their experiences with web video to their peers' learning experiences (see Table 7).

Table 7

Repeated-Measures ANOVA for Selected Concern Scores

No	Statements of Concern	Estimated marginal means		F	p^a	ŋ
		Pretest	Posttest			
6	I'd like to help other students in using web video.	5.33	3.60	9.43	.008	.41
16	I'd like to know what resources are available if the instructor decides to integrate web video in course.	4.00	3.00	5.83	.030	.29
23	I'd like to modify my use of web video based on the experiences of other students.	4.13	2.20	9.24	.009	.40
35	Coordination of learning tasks and technologies is taking too much of my time.	5.13	3.73	5.04	.041	.27

Note. [a]Adjustment for multiple comparisons: Bonferroni.

This finding suggests that students need more time and hands-on practice with web videos to develop their own technical expertise and coherent personal strategy for web video application. Once students' self-concerns about web video are resolved and their learning practices with web video become routine, then the higher stages of concern will emerge and reinforce students to share their learning experiences with their peers and eventually improve or modify their own practices with web video

Participants' levels of use of web video. The LoU part of the survey asked the participants to select one of the eight levels of use (see Figure 9) that best described where they currently stood in the adoption of web video for their learning. The pretest results (Table 8) indicated that half of the participants felt that they either had no experience or prior involvement with web video (20%) or were curious about learning about web video (33.3%). Another 20% of the participants reported themselves to be at the initial stage of using web video (i.e., preparation and mechanical use levels).

Table 8

Pre-Post Frequencies for Levels of Use of Web Video

LoU Measures	Pretest *f* (%)	Posttest *f* (%)
Lower Level of Use		
Non-Use	3 (20.0)	0
Orientation	5 (33.3)	3 (20.0)
Preparation	2 (13.3)	2 (13.3)
Mechanical Use	1 (6.7)	2 (13.3)
Higher Levels of Use		
Routine	2 (13.3)	3 (20.0)
Refinement	1 (6.7)	2 (13.3)
Integration	1 (6.7)	2 (13.3)
Renewal	0	1 (6.7)

In sum, the majority of students (73.3%) identified themselves as new to or inexperienced in using web video. Nevertheless, almost one third of the participants (26.7%) reported that they were comfortable with web video and knew how to enhance their facility with it (i.e., routine, refinement, and integration). None of the participants

reported the renewal level of use – that is, seeking modifications or alternatives to web video use.

Upon completion of the Project, the comparison of pre- and posttest data (see Table 8) showed the expected changes in self-reported levels of web video use. Participants demonstrated an observable change in their levels of use from relatively low levels (i.e., orientation, preparation, and mechanical use) to considerably higher levels. A majority of the participants (53.3%) reported their level of use as routine or higher, compared to 26.7% at the pretest stage. Such an increase among higher levels of use suggests that the Web Video Project may have enabled participants to build greater confidence in using web video to facilitate their learning. This evidence is also consistent with the findings of previous studies investigating the level of adoption of other innovative technologies for learning and teaching (Castillo, 2007; Orr & Mrazek, 2008).

The hypothesis (H_1) was not supported. The repeated-measures ANOVA found no significant difference between pre- and posttest sample mean stage of concern scores for participants at the .05 level of probability, except awareness (see Table 6). Although evidence indicated that the Web Video Project did not significantly influence participants' stages of concern about web video, the LoU data analysis indicated that a majority of participants felt comfortable using web video by the end of the Project.

4.3 Research Question Two: Perceptions of Web Video Affordances and Constraints for Learning

RQ2: What are the affordances and constraints of integrating web video into a traditional classroom-based course?

H_2: As students progress through the Project, they will recognize the learning value of web video.

To answer the stated research question and test the hypothesis, I performed statistical analyses on data collected from the *Web Video Affordances and Constraints* survey that was administered before and after implementation of the research treatment, and relevant qualitative data analysis of participants' responses to open-ended questions, interview transcripts, and learning artefacts submitted during the study. The survey included two sections: (a) web video affordances for learning and (b) web video constraints for learning. The participants were asked to evaluate their perceptions using a 5-point Likert-type scale with values ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The survey also included four open-ended questions. Seventeen students responded to this survey (65.4% response rate) with complete responses at both pre- and posttest administrations.

Perceived affordances of web video for learning. The purpose of the "affordances" section was to explore the functional significance and distinct attributes of web video for learning, and to measure participants' perceptions of the benefits of web video integration, such as opportunities for content contextualization, opportunities for student-driven learning, and impact on student achievement.

The role of emergent Web 2.0 technologies for learning. The survey results indicated that students perceived web video and blogging as an indispensable Web 2.0 technology combination for learning. When participants were asked about which of the Web 2.0 technologies – web video or blogging – they considered "indispensable" for

learning, a repeated-measures ANOVA on the outcome variables revealed significant treatment effects on students' perceptions of web video, $F(1, 14) = 12.73$, $MSE = 3.33$, $p = .003$, $\eta = .48$, and blogging, $F(1, 14) = 5.91$, $MSE = 1.63$, $p = .029$, $\eta = .30$ (Table 9). In addition, using Pillai's Trace, repeated-measures MANOVA revealed the significant effect of the Web Video Project on students' perceptions of the learning value afforded by the combination of web video and blogging, $V = .49$, $F(2, 13) = 6.01$, $p = .014$.

Table 9

Repeated-Measures ANOVA for Perceptions of Indispensable Web 2.0 Technologies for Learning

Measure	Estimated marginal means		F	p^a	η
	Pretest	Posttest			
Web video	2.47	1.80	12.73	.003	.48
Blogging	2.60	2.13	5.91	.029	.30

Note. $N = 15$. Based on 5-point scale ranged from 1 (*strongly agree*) to 5 (*strongly disagree*).
[a]Adjustment for multiple comparisons: Bonferroni.

The hypothesis (H_2) was supported. The difference between pre- and posttest sample means for web video was statistically significant at the .05 level, suggesting that participation in the Project increased participants' perception of the learning value of web video. This effect may be attributable to students' perceptions of the advantages of web video for learning, particularly its inherent capability of easy digital capturing and open sharing (i.e., multimodality), as well as the learning opportunities to explore multiple perspectives, make learning enjoyable, and engage in challenging activities. These web video affordances are discussed below.

The analysis of participants' written responses further suggests that students gained confidence in using both web video and blogging for learning. In this regard, some of the participants' comments made upon completion of the Project are worth mentioning:

- "All of my doubts have been put to rest. Despite any negative thoughts about Web 2.0 as a tool for the classroom, I will support its use 100%."
- "I don't think I had this complete understanding before this course of what Web 2.0 is the supplement to learning is [*sic*]. I've been able to take what I've learned in the last few weeks and I've seen the value …"
- "I think YouTube should impart in the curriculum [*sic*] the way we're using them [videos] now in our class. I think every single classroom could use that format and really benefit from it…"

Advantageous attributes of web video for learning. The rate at which participants reported their positive perceptions of web video attributes was quite high during both pre- and posttest administrations. At the pretest, web video's multimodality (i.e., a capability of digital capturing and sharing, including embedding) was highly valued by the participants (76.5%), followed by its entertainment value (70.6%), and the varying degrees of oversight of content production (52.9%). By the end of the Project, these qualities received an overwhelmingly positive feedback from the participants, ranging from 76% to 100%. The comparison of the pre- and posttest means (Table 10) suggests that, on the whole, most participants sufficiently agreed on the proposed attributes of web video for their learning.

Table 10

Pre-Post Percentage Frequencies for Web Video Attributes

Measures	Factor	Strongly agree (%) Strongly disagree				
		1	2	3	4	5
Web videos are entertaining.	Pretest	5.9	64.7	23.5	5.9	0
	Posttest	41.2	58.8	0	0	0
Web videos come from many of sources with varying degrees of content oversight.	Pretest	0	52.9	41.2	5.9	0
	Posttest	11.8	70.6	11.8	5.9	0
Web videos offer multiple perspectives on the issue.	Pretest	0	70.6	17.6	11.8	0
	Posttest	29.4	52.9	17.6	0	0
Web videos represent real-life issues.	Pretest	5.9	76.5	11.8	5.9	0
	Posttest	23.5	52.9	23.5	0	0
Web videos can be linked to or embedded into other.	Pretest	0	76.5	17.6	0	5.9
	Posttest	35.3	41.2	23.5	0	0

The results of repeated-measures ANOVA showed that 3 of the 5 "web video attributes" variables were significantly affected by the research treatment (see Table 11). In particular, the Project had significant effects on participants' perceptions of the "entertainment" web video attribute, $F(1, 16) = 8.73$, $MSE = 4.24$, $p = .009$, $\eta = .35$; the "multiple perspectives" attribute, $F(1, 16) = 9.26$, $MSE = 2.38$, $p = .008$, $\eta = .37$; and the "multimodality" attribute, $F(1, 16) = 5.89$, $MSE = 5.89$, $p = .027$, $\eta = .27$.

Table 11

Repeated-Measures ANOVA for Web Video Attributes

Measure	Estimated marginal means		F	p^a	η
	Pretest	Posttest			
Web videos are entertaining.	2.29	1.59	8.73	.009	.35
Web videos come from many of sources with varying degrees of content oversight.	2.53	2.18	1.71	.210	.10
Web videos offer multiple perspectives on the issue.	2.41	1.88	9.26	.008	.37
Web videos represent real-life issues.	2.18	2.00	.81	.382	.05
Web videos can be linked to or embedded into other.	2.35	1.88	5.89	.027	.27

Note. [a]Adjustment for multiple comparisons: Bonferroni.

The results of statistical analysis were supported by students' comments in their personal statements, which emphasized their appreciation for the ways in which web video use could break up the monotony of lectures and capture the attention of both visual and non-visual learners. The statements also reflected positively on students' experience of embedding videos in their blogs to illustrate their thinking. Furthermore, qualitative data analysis gave evidence of additional valuable attributes of web video for students, such as instant gratification (e.g., "[having] instant results from searches [on a video sharing website], ability to preview results in thumbs") and easy searchability (e.g., "being able to pretty much find things you are looking for quickly and easy [*sic*]").

When participants were asked to define "web video" on their own, most of them used descriptors such as "user-created content" and "diversified representation of information." For instance, one participant provided an example of how user-created web video brought value to other classes that the respondent was taking:

> In a Shakespeare class, as a treat, we were allowed to watch movies that were produced by very good producers that enhanced everybody's understanding of that particular play we read. There is a Shakespeare company in Mobile, Ala. They are not actors. Their productions are created on the sidewalk in front of the bar. They do Shakespeare play may be in 5 min. They put video of themselves on YouTube. These videos are not academically sound enough...but that video has a value.

Furthermore, when comparing web video to earlier video technologies, such as television, DVD, films and the like, participants in interviews identified four attributes differentiating web video from those technologies (Figure 11). The distinct quality of web video that students noted most frequently was its accessibility (33.3%), meaning that video sharing websites provided easy and immediate access to the required video content. The next unique quality of web video, from students' perspective, was related to customization (25.9%), meaning that video sharing websites allow students to search for web video according to their own individual learning needs. For instance, one participant noted:

> With all inclusion we got in our school, we're constantly seeking alternative resources that brought things down, and that is part I'm doing all the time. We have some dyslexic children...after I found YouTube video I have some teachers to see that. I have some Special Education directors that need to see that. I'm serious. It shows how dyslexic children can learn to be independent, instead of

always rely on an inclusion teacher, who cannot be always with them. I hope that our teachers would have access to YouTube at school.

The third most noted quality of web video could be described as content diversity (18.5%), including internal diversity (in terms of content) and the diversity of the form of available videos (i.e., multiple media formats). Finally, the last web video quality most worthy of mention could be defined as multimodality (7.4%), referring to the numerous capabilities for embedding, re-mixing, and managing, and storing video content on the Web.

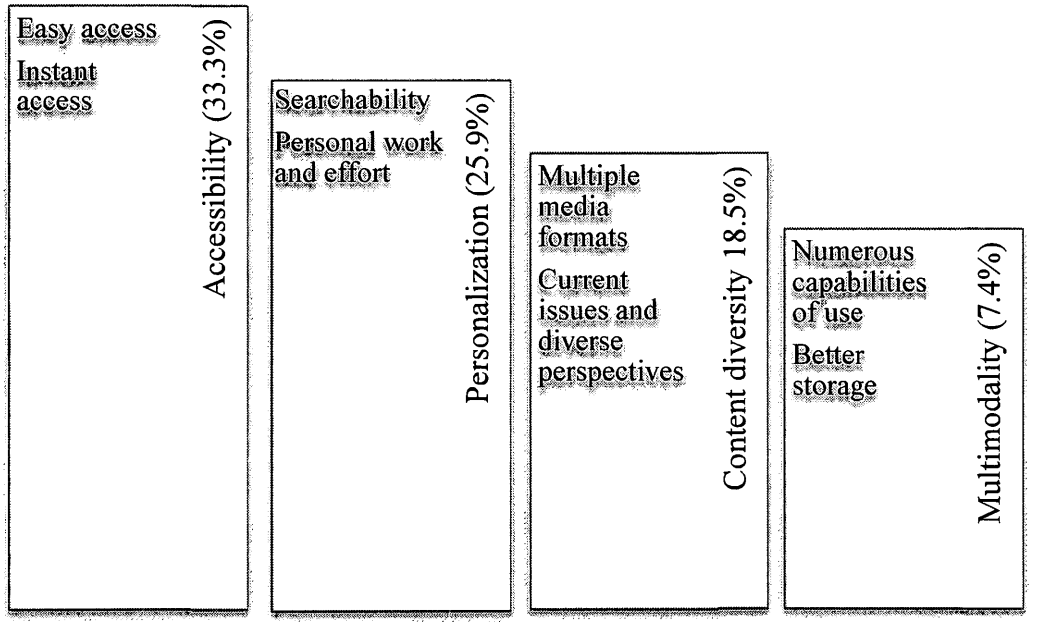

Figure 11. The percentage of thematic units obtained in qualitative data analysis representing participants' perceptions of the distinctive attributes of web video in contrast to prior types of video technologies.

Qualitative data analysis produced evidence that most students perceived web video (such as YouTube) as an enhancement for their learning and as an alternative source for immediate information. According to the frequency distribution of participants' responses, nearly 66% of thematic units described web video as a beneficial means for learning, and 30.2% characterized web video as a source of knowledge.

Opportunities for content contextualization. When it comes to learning opportunities afforded by web video, the study – which is grounded on a situated cognition perspective – presumed that web video has the potential to promote authenticity (i.e., authentic, real-life experiences) and contextuality (i.e., practical application) of learning and knowledge construction. Therefore, students were asked to report on whether they perceived opportunities afforded by web video for content contextualization (i.e., an opportunity to situate the course material to be learned within a rich context) (Barab, Hay, & Duffy, 1998) over the period of the investigation.

Prior to entering the Project, the majority of participants indicated they agreed that web video provided opportunities for content contextualization (see Table 12). In particular, the top four learning opportunities which were highly supported by participants were: (a) an opportunity to explore broadly other people's ideas and perspectives (82.4%); (b) an opportunity for authentic learning (76.5%); (c) an opportunity to focus attention on the topic (64.7%); and (d) an opportunity to visualize ideas and theoretical concepts (64.7%). Following the implementation of the Project, the frequency of participants' responses slightly decreased, but the position of each learning opportunity afforded by web video remained nearly stable.

Table 12

Pre-Post Percentage Frequencies for Web Video Affordances for Content Contextualization

Measures (Use of web video...)	Factor	Strongly agree (%)				Strongly disagree
		1	2	3	4	5
...makes learning more authentic	Pretest	11.8	64.7	11.8	11.8	0
	Posttest	35.3	41.2	17.6	5.9	0
...enables to explore broadly other people's ideas and perspectives	Pretest	5.9	76.5	17.6	0	0
	Posttest	47.1	29.4	17.6	5.9	0
...helps to set the context	Pretest	0	41.2	47.1	11.8	0
	Posttest	5.9	47.1	41.2	5.9	0
...helps to visualize ideas and theoretical concepts	Pretest	5.9	58.8	35.3	0	0
	Posttest	35.3	35.3	23.5	5.9	0
...enhances understanding of theoretical concepts	Pretest	17.6	35.3	47.1	0	0
	Posttest	17.6	58.8	17.6	5.9	0
...helps to focus attention on topic	Pretest	11.8	52.9	29.4	5.9	0
	Posttest	29.4	41.2	23.5	5.9	0

Repeated-measures ANOVAs indicated that no significant difference was attached to the slight variation in sample means for the "content contextualization" measures between pre- and posttest time periods (Table 13), suggesting that students' notions about web video as a means for content contextualization were formed before entering the study. This finding was not surprising, since video technology in its earlier forms has been used for some time, and students were most likely to have previously utilized video content for contextualization – for instance, to observe real-life situations, sequences in motion, rare or dangerous events, interviews with people, and the like (Caladine, 2008; Hutton, 1984; Roberts, 1998; Trotter, 1970). Furthermore, these

findings may suggest that web video possesses similar potential to provide contextual cues for the learning material as previous video formats (e.g., visualization, setting the context, broader exploration, etc.).

Table 13

Repeated-Measures ANOVA for Web Video Affordances for Content Contextualization

Measures (Use of web video…)	Estimated marginal means		F	p^a	ŋ
	Pretest	Posttest			
…makes learning more authentic	2.24	1.94	1.74	.206	.10
…enables to explore broadly other people's ideas and perspectives	2.12	1.82	2.04	.172	.11
…helps to set the context	2.71	2.47	1.36	.260	.08
…helps to visualize ideas and theoretical concepts	2.29	2.12	2.47	.136	.13
…enhances understanding of theoretical concepts	2.29	2.12	1.31	.269	.08
…helps to focus attention on topic	2.29	2.06	1.66	.216	.10

Note. [a]Adjustment for multiple comparisons: Bonferroni.

Opportunities for student-driven learning. Another cluster of opportunities afforded by web video is related to student-driven learning. The frequency with which participants reported their perceptions about those opportunities is shown in Table 14. At the pretest, the majority of participants recognized the following as the top three learning opportunities afforded by web video: (a) a greater personal motivation to engage in learning (88.2%); (b) an opportunity to be an active participant instead of a "consumer of information" (76.4%); and (c) an opportunity to collaborate with peers (70.6%). Following the implementation of the Project, the frequency of participants' responses

slightly increased, resulting in high support for all motivators. The support for the ability to work through course material at one's own pace remained stable (52.9%) at both pre- and posttest observations.

Table 14

Pre-Post Percentage Frequencies for Web Video Affordances for Student-Driven Learning

Measures (Use of web video...)	Factor	Strongly agree (%)				Strongly disagree
		1	2	3	4	5
...motivates to get more involved in learning	Pretest	17.6	70.6	11.8	0	0
	Posttest	35.3	52.9	5.9	5.9	0
...makes learning more challenging	Pretest	17.6	29.4	11.8	41.2	0
	Posttest	23.5	41.2	29.4	5.9	0
...enables to work through course material at one's own pace	Pretest	17.6	35.3	41.2	5.9	0
	Posttest	17.6	35.3	35.3	11.8	0
...promotes collaboration with fellow students	Pretest	11.8	58.8	23.5	5.9	0
	Posttest	35.3	47.1	11.8	5.9	0
..gives opportunity to be an active participant instead of "a consumer of information"	Pretest	17.6	58.8	23.5	0	0
	Posttest	41.2	47.1	5.9	5.9	0

The results of repeated-measures ANOVA showed that most of the pre-post means for "student-driven learning" measures were not significantly affected by the research treatment (Table 15). However, the results revealed a significant effect of the Project on the measure "Use of web video makes learning more challenging," $F(1, 16) = 4.68$, $MSE = 2.94$, $p = .046$, $\eta = .23$, implying that students may have perceived the Project as a challenging and perhaps demanding learning experience.

Table 15

Repeated-Measures ANOVA for Web Video Affordances for Student-Driven Learning

Measures (Use of web video...)	Estimated marginal means		F	p^a	ŋ
	Pretest	Posttest			
...motivates to get more involved in learning	1.94	1.82	.39	.543	.02
...makes learning more challenging	2.77	2.18	4.68	.046	.23
...enables to work through course material at one's own pace	2.35	2.41	.06	.817	.00
...promotes collaboration with fellow students	2.24	1.88	3.43	.083	.18
..gives opportunity to be an active participant instead of "a consumer of information"	2.06	1.77	2.47	.136	.13

Note. [a]Adjustment for multiple comparisons: Bonferroni.

This postulation was supported by students' comments submitted during the midpoint feedback. The participants indicated that they took up the challenge of learning at the Project's swift pace, of familiarizing themselves with multiple new technologies, and of undertaking complex tasks that might be open to multiple interpretations:

- "[Web video] makes [learning] challenging in a sense that I can learn so much faster than I did before, I can pursue my search to a much degree; and the challenge is not where I go out to find this information, but how do I learn it how much information I'm going to take. It's a challenge in a good way." [*sic*]
- "At times the technology has been a little overwhelming due to the fact that you must deal with multiple unfamiliar technologies simultaneously, but I am very pleased."

- "For me, learning so many new concepts at once has been challenging. However, if you are only meeting once per week, there really isn't any other choice. The lack of contact with a knowledgeable peer or instructor has made the Project more challenging."

Qualitative data analysis confirmed some of the presented findings in relation to opportunities for student-driven learning. In interviews, the participants expressed their sense that web video was very useful when making a teachable point in the classroom, and specified a number of ways that YouTube could enhance the learning process. For instance, from the perspective of the participating students, the possibility to learn from others (featured in 25% of thematic units) was the most persistent benefit for learning:

> I like the fact that I can get input and suggestions from other people. It is always refreshing to know that others out there share the same views that I do. I also like to relate the current attitude of society towards political and social thoughts to my students and that is why I like [user-created] web video.

Some participants acknowledged that the use of YouTube helped them save time (featured in 10% of thematic units): "When your plans go wrong or you need to do something impromptu that doesn't take much time you can use YouTube."

Impact of web video on student achievement. Students were also asked whether academic achievement could be improved with the use of web video. The overwhelming majority of participants agreed that the use of web video could increase their academic achievement (Table 16). However, no significance was attached to the variation of the means for that variable, $F(1, 16) = .81$, $MSE = .53$, $p = .382$, $\eta = .05$.

Table 16

Pre-Post Percentage Frequencies for Perceived Web Video Impact on Achievement

Measure	Factor	Strongly agree (%) Strongly disagree				
		1	2	3	4	5
Use of web video increases academic achievement.	Pretest	17.6	64.7	17.6	0	0
	Posttest	41.2	41.2	11.8	5.9	0

Lastly, using Pillai's Trace, repeated-measures MANOVA revealed non-significant effects of the Project on the participants' perceptions of web video affordances for learning (i.e., content contextualization, student-driven learning, and achievement), $V = .64$, $F(1, 16) = .73$, $p = .70$.

Perceived constraints of web video for learning. The purpose of the second survey section was to explore students' anticipated and actual perceptions of web video constraints for learning, such as the lack of prerequisite skills, video sharing platform constraints, a shortage of web video searching skills, the lack of conceptual understanding of web video, and learning challenges (i.e., time constraints, a lack of instructional support, and a lack of motivation).

Lack of prerequisite skills. The participants indicated that lack of self-regulated learning skills and lack of Internet skills were unlikely to prevent them from effective use of web video in learning (Table 17). Their perceptions about of the potential impact of lacking these skills did not change over the period of the study; however, the number of participants who were undecided about whether self-regulated learning skills were needed for effective video use for learning largely increased by almost 20%.

Table 17

Pre-Post Percentage Frequencies for Perceived Lack of Prerequisite Skills

Measures	Factor	Strongly agree (%) Strongly disagree				
		1	2	3	4	5
Lack of self-regulated learning skills	Pretest	11.8	17.6	23.5	29.4	17.6
	Posttest	11.8	17.6	41.2	23.5	5.9
Lack of basic Internet skills	Pretest	5.9	17.6	23.5	29.4	23.5
	Posttest	17.6	11.8	17.6	29.4	23.5

Similarly, the qualitative data analysis did not identify any comments regarding the lack of prerequisite skills, particularly the lack of Internet skills. One of the participants noted that no one lacks Internet skills now. Another went even further, suggesting that "it is unnecessary to teach this [Internet skills] in today's university setting. Anyone that can complete a degree in today's learning environments should be already well endowed with the necessary skills."

Lastly, the results of repeated-measures ANOVA on the perceived lack of prerequisite skills revealed non-significant effect of the Project on the lack of self-regulated learning skills, $F(1, 16) = 1.00$, $MSE = .74$, $p = .33$, $\eta = .06$, and the lack of basic Internet skills, $F(1, 16) = .21$, $MSE = .27$, $p = .65$, $\eta = .01$.

Web video technology constraints. Another commonly perceived barrier to learning was associated with web video technology constraints (Table 18). In the case of this Project, the participants frequently worked with streaming web video hosted on YouTube. Since most YouTube video clips were 10 minutes long, the duration of video clips was not an obstacle. Most Internet-related barriers were well anticipated by the

participants during pre- and posttest administrations. An overwhelming majority of respondents reported concerns about the compatibility of video sharing websites with various types of web browsing software (76.4%), as well as concerns about the bandwidth and internet speed needed to support streaming video experiences (64.7%). Before the Project, half of the participants were highly concerned about being unable to download a web video clip either to their computer hard drive or to an external USB drive. By the end of the Project, this technical obstacle appeared to be minimized.

Table 18

Pre-Post Percentage Frequencies for Web Video Technology Constraints

Measures	Factor	Strongly agree (%) Strongly disagree				
		1	2	3	4	5
Takes too long to view a video clip	Pretest	5.9	23.5	35.3	29.4	5.9
	Posttest	0	23.5	41.2	29.4	5.9
Not being able to download a video clip	Pretest	29.4	23.5	29.4	17.6	0
	Posttest	23.5	11.8	11.8	35.3	17.6
Having problems with my browser	Pretest	52.9	23.5	23.5	0	0
	Posttest	52.9	11.8	11.8	17.6	5.9
Limited bandwidth / Slow connection	Pretest	35.3	29.4	23.5	5.9	5.9
	Posttest	23.5	41.2	17.6	11.8	5.9
Technical problems with video sharing websites	Pretest	11.8	41.2	29.4	11.8	5.9
	Posttest	5.9	47.1	23.5	17.6	5.9

Repeated-measures ANOVA on the outcome measures revealed only one significant treatment effect on the perceived lack of ability to download a video clip, $F(1,$

16) = 4.81, *MSE* = 4.97, p = .043, η = .23. Participants' remaining perceptions of web video technology constraints were not significantly affected by the Project (see Table 19).

Table 19

Repeated-Measures ANOVA for Web Video Technology Constraints

Measures	Estimated marginal means		F	p^a	η
	Pretest	Posttest			
Takes too long to view a video clip	3.06	3.18	.21	.651	.01
Not being able to download a video clip	2.35	3.12	4.81	.043	.23
Having problems with my browser	1.71	2.12	1.15	.300	.07
Limited bandwidth / Slow connection	2.18	2.35	.38	.548	.02
Technical problems with video sharing websites	2.59	2.71	.11	.750	.01

Note. [a]Adjustment for multiple comparisons: Bonferroni.

These results of statistical analysis were confirmed by qualitative data analysis of participants' written responses, suggesting that technology and website constraints were two of the most frequently cited problems (featured in 30% of thematic units) during the Project. Most of the issues were related to incompatibility with web browsers and the time-consuming process of loading web videos to view: "I don't always know how to use it. I also dislike that it often has to buffer or you can't see the whole video." Another constraint raised by the participants was the incompatibility of different video file formats (e.g., .avi, .asf, .mpeg, and .mov) with Microsoft Windows MovieMaker. The technology incompatibility issue may have been compounded by the fact that students opted to use their own video capture devices (e.g., smartphones, camcorders, and webcam) to shoot their video footage. To alleviate this problem, students were provided with "on-the-fly"

advice and personalized hands-on assistance with those mobile devices, and were instructed in converting their raw video output into an appropriate video file format.

Lack of web video searching skills. The next group of constraints – the lack of web video searching skills – relates to the difficulties and frustrations perceived by students when navigating video sharing websites in their quest for relevant video clips, as well as the obstacles they encountered when storing and organizing web video content. In addition, the rapid growth of video sharing networks has become another roadblock that can make web video searching more difficult and discourage students from integrating web video into their learning.

Before the Project, half of the participants anticipated that a lack of skill in locating a particular web video, coupled with the proliferation of video sharing websites, were more likely to impose constraints on the integration of web video into the learning process (Table 20). Nearly 47% of participants anticipated that the lack of web searching strategies could hinder them from managing web videos efficiently. Upon completion of the Project, the frequency with which participants reported a perceived lack of web video searching skills decreased. Most students appeared to have developed the navigation and searching skills needed to participate successfully in the Project.

Table 20

Pre-Post Percentage Frequencies for Perceived Lack of Web Video Searching Skills

Measures	Factor	Strongly agree (%) Strongly disagree				
		1	2	3	4	5
Not being able to find the video I am looking for	Pretest	17.6	35.3	35.3	11.8	0
	Posttest	0	41.2	5.9	41.2	11.8
Not being able to efficiently store and organize videos I find	Pretest	5.9	41.2	47.1	5.9	0
	Posttest	5.9	29.4	5.9	47.1	11.8
Not being able to return to the video I once watched	Pretest	5.9	23.5	35.3	23.5	11.8
	Posttest	5.9	29.4	5.9	41.2	17.6
Not being able to visualize where I have been and where I can go	Pretest	0	17.6	58.8	17.6	5.9
	Posttest	0	23.5	23.5	35.3	17.6
Rapid growth of video sharing networks	Pretest	0	52.9	17.6	23.5	5.9
	Posttest	5.9	35.3	29.4	29.4	0

The results of repeated-measures ANOVA revealed two significant treatment effects on the perceived lack of ability to find a relevant web video, $F(1, 16) = 12.75$, $MSE = 5.77$, $p = .003$, $\eta = .44$, and the perceived lack of ability to store and organize web video efficiently, $F(1, 16) = 5.88$, $MSE = 4.97$, $p = .028$, $\eta = .27$. Conversely, three other three outcome measures related to a perceived lack of web video searching skills were not significantly affected by the Project (see Table 21). These findings suggest that students' participation in the Project may have helped them rectify a deficiency in their own web video navigation and efficient management skills, and thus to overcome this significant barrier to effective exploration of video content over the Web.

Table 21

Repeated-Measures ANOVA for Perceived Lack of Web Video Searching Skills

Measures	Estimated marginal means		F	p^a	ŋ
	Pretest	Posttest			
Not being able to find the video I am looking for	2.41	3.24	12.75	.003	.44
Not being able to efficiently store and organize videos I find	2.53	3.29	5.88	.028	.27
Not being able to return to the video I once watched	3.12	3.35	.88	.361	.05
Not being able to visualize where I have been and where I can go	3.12	3.47	1.31	.269	.08
Rapid growth of video sharing networks	2.82	2.82	0	1	0

Note. [a]Adjustment for multiple comparisons: Bonferroni.

Qualitative data analysis revealed that students rarely mentioned any frustrations caused by a lack of web video searching skills (featured in 10% of thematic units) during the Project. Most of their frustrations came from encountering in their search results a high number of web videos with unnecessary information which required extensive sorting. However, at the posttest, there were no reports of a perceived lack of skills required for effective web video searching.

Lack of conceptual understanding of web video. Another group of constraints is associated with the lack of conceptual understanding of user-created web video and the way it is produced and delivered (Table 22). Before the Project, nearly 60% of participants reported difficulty grasping the concept of user-created web video. They communicated their anxieties about the credibility of web video producers or video uploaders (41.2%), and about the accuracy and reliability of web video content (47.1%).

During the posttest observation, participants' concerns about the nature of user-created video content and the negative implications of potentially low content quality for learning slightly increased.

Table 22

Pre-Post Percentage Frequencies for Perceived Lack of Conceptual Understanding of Web Video

Measures	Factor	Strongly agree (%) Strongly disagree				
		1	2	3	4	5
Lack of understanding of what web video really is.	Pretest	11.8	47.1	23.5	17.6	0
	Posttest	23.5	23.5	23.5	23.5	5.9
Anxiety about credibility of video producers	Pretest	11.8	29.4	23.5	23.5	11.8
	Posttest	0	41.2	29.4	29.4	0
Anxiety about video content quality	Pretest	5.9	41.2	17.6	23.5	11.8
	Posttest	5.9	47.1	35.3	11.8	0

The results of repeated-measures ANOVA showed that participants' perceived lack of conceptual understanding of web video was not significantly affected by the Project (see Table 23).

Table 23

Repeated-Measures ANOVA for Perceived Lack of Conceptual Understanding of Web Video

Measures	Estimated marginal means		F	p^a	η
	Pretest	Posttest			
Lack of understanding of what web video really is.	2.47	2.65	.51	.484	.03
Anxiety about credibility of video producers	2.94	2.88	.04	.842	.03
Anxiety about video content quality	2.94	2.53	2.09	.168	.12

Note. [a]Adjustment for multiple comparisons: Bonferroni.

Qualitative data analysis indicated students' lack of understanding of web video, and demonstrated that most of them were concerned by the quality of web video content since it was produced with minimum content oversight. For instance, some participants described the content of web video as "erroneous information" or "junk" that might make its way to those students who need it least: "They [students] are likely to take erroneous information for fact because the students have no idea how to fact check [*sic*]; they do not seem to understand that the Internet has no great mediator to ensure quality and factual information [*sic*]." This group of constraints was the most cited by participants over the period of study (featured in 35% of thematic units). Furthermore, in their responses participants suggested that skills for assessing the accuracy of web video content should be made mandatory components of university instruction.

Learning challenges. When participants were asked before entering the Project to report their perceptions about the potential learning challenges posed by web video, the frequency with which they reported perceived barriers to learning was considerably low

(35% and lower) (Table 24) in contrast to their perceptions of other types of web video constraints (i.e., those caused by web video technology and a lack of web video searching skills). Across all the "learning challenges" measures, the overall level of the mean scores was higher than 3.05 on a 5-point scale. On the whole, this finding indicated that time constraints, lack of support, and lack of motivation were not perceived as major barriers to learning and thus did not hinder students from utilizing web video for learning.

Table 24

Pre-Post Percentage Frequencies for Learning Challenges

Measures	Factor	Strongly agree (%) Strongly disagree				
		1	2	3	4	5
Time constraints						
Requires additional training in using web video	Pretest	5.9	29.4	23.5	35.3	5.9
	Posttest	0	29.4	35.3	29.4	5.9
Learning with web video takes too much time	Pretest	0	17.6	35.3	35.3	11.8
	Posttest	0	29.4	41.2	17.6	11.8
Lack of instructional support						
Insufficient instructor's support	Pretest	0	35.3	29.4	17.6	17.6
	Posttest	0	41.2	23.5	23.5	11.8
Traditional learning resources can be neglected	Pretest	5.9	11.8	35.3	35.3	11.8
	Posttest	11.8	17.6	29.4	35.3	5.9
Lack of motivation						
Lack of confidence when using web video	Pretest	11.8	23.5	11.8	35.3	17.6
	Posttest	11.8	17.6	29.4	29.4	11.8
Anxieties about negative impact of web video on learning	Pretest	0	23.5	35.3	17.6	23.5
	Posttest	17.6	11.8	23.5	35.3	11.8

The results of repeated-measures ANOVA showed that the measures used to assess student perceptions of three groups of learning challenges (i.e., time constraints, lack of instructional support, and lack of motivation) were not significantly affected by the Project (see Table 25). The evidence appears to support the following claims: (a) time constraints may not have prevented students from learning; (b) students may have received adequate support (instructional and technical) during the Project; and (c) students may have had confidence in their ability to use web video for learning.

Table 25

Repeated-Measures ANOVA for Learning Challenges

Measures	Estimated marginal means		F	p^a	ŋ
	Pretest	Posttest			
Time/Efforts constraints					
Requires additional training in using web video	3.06	3.12	.03	.87	.00
Learning with web video takes too much time	3.41	3.12	1.21	.29	.07
Lack of instructional support					
Insufficient instructor's support	3.18	3.06	.19	.67	.01
Traditional learning resources can be neglected	3.53	3.06	1.21	.29	.07
Lack of motivation					
Lack of confidence when using web video	3.24	3.12	.15	.71	.01
Anxieties about negative impact of web video on learning	3.41	3.12	1.74	.21	.10

Note. [a]Adjustment for multiple comparisons: Bonferroni.

Posttest qualitative data analysis may have provided some additional explanation about the issue of time constraints by pointing to the Projects' expeditious

implementation, which may have rushed student learning (featured in 40% of thematic units at the posttest):

- "I feel that the information needed to conduct the Project properly was given in too brief of a time [*sic*]. I feel that the current Project takes longer that the time given to complete it."
- "I think that Web 2.0 should be a choice of learning [*sic*], and really it does take up a lot of unnecessary time."
- "About the only problem I have majorly found is find time to get all this done. The fast pace in the class." [*sic*]

Rank order analysis of posttest mean scores for the "constraints" measures (Table 26) suggested a number of major web video constraints for learning (ranked from 1st to 5th most commonly reported): cross-browser compatibility problems, insufficient bandwidth for quality video viewing experience, concerns around the authenticity and quality of web video content, lack of conceptual understanding of the way web video is produced and distributed, and technical problems with video sharing websites. Students reported with less frequency the following perceived web constraints for learning: time constraints (10th place); lack of confidence in the ability to use web video for learning (10th place); excessive buffering and download time for web video (ranked between 10th and 11th places); lack of web video searching skills (e.g., ranked between 12th and 15th places); and lack of basic Internet skills (13th place).

Table 26

Posttest Rank Analysis for Web Video Constraints

Measures	*M* (*SD*)[a]	Ranking[b]
Lack of self-regulated learning skills	2.94 (1.09)	8
Lack of basic Internet skills	3.29 (1.45)	13
Takes too long to view a video clip	3.18 (.88)	11
Not being able to download a video clip	3.12 (1.50)	10
Having problems with my browser	2.12 (1.41)	1
Limited bandwidth / Slow connection	2.35 (1.17)	2
Technical problems with video sharing websites	2.71 (1.05)	5
Not being able to find the video I am looking for	3.24 (1.15)	12
Not being able to efficiently store and organize videos I find	3.29 (1.21)	13
Not being able to return to the video I once watched	3.35 (1.27)	14
Not being able to visualize where I have been and where I can go	3.47 (1.07)	15
Rapid growth of video sharing networks	2.82 (.95)	6
Lack of understanding of what web video really is	2.65 (1.27)	4
Anxiety about credibility of video producers	2.88 (.86)	7
Anxiety about video content quality	2.53 (.80)	3
Requires additional training in using web video	3.12 (.93)	10
Learning with web video takes too much time	3.12 (.99)	10
Insufficient instructor's support	3.06 (1.09)	9
Traditional learning resources can be neglected	3.06 (1.14)	9
Lack of confidence when using web video	3.12 (1.22)	10
Anxieties about negative impact of web video on learning	3.12 (1.32)	10

Note. [a]Based on 5-point scale ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). [b]The ranks are assigned to posttest mean scores that are sorted out in ascending order (e.g., the ranks of 2.12, 2.35, and 2.53 would be 1, 2, and 3, respectively)

Lastly, using Pillai's Trace, repeated-measures MANOVA revealed non-significant effect of the Project on the group of web video constraints for learning, $V = .99$, $F(1, 16) = 11.11$, $p = .232$.

4.4 Research Question Three: Perceived Impact of Web Video on Learning

RQ3: How does web video use and production facilitate student learning?

H_3: As students progress through the Project, they will achieve greater level of web video use and production skills

To answer the stated research question and test the hypothesis, I performed statistical analysis of the data collected from the pretest *Background* and posttest *Web Video Impact Surveys,* and conducted relevant qualitative data analysis of participants' learning artefacts, their interview transcripts, and their responses to open-ended survey questions. The purpose of the Web Video Impact survey was to observe the impact of the Web Video Project on students' perceptions of learning and to understand the influences of web video appropriation and web video composition on the learning process. The survey consisted of six sections: (a) students' self-assessment of their own Internet and Web 2.0 technology skills, (b) students' understanding of web video, (c) students' perceptions of video-enhanced blogging, (d) students' perceptions of web video production, (e) students' perceptions of web video mediated learning, and (f) students' overall satisfaction with the Project. Seventeen students responded to the posttest survey (65.4% response rate).

Participants' use of Internet and video sharing websites. As part of Project-related activities, students spent an average of four to six hours online per week. This time was spent browsing video sharing websites, appropriating relevant web videos, engaging in video-enhanced blogging (e.g., composing their own posts, reading and responding to others' blogs), and producing web videos. However, the results of

descriptive analysis showed that the pattern of self-reported Internet use underwent a noticeable change that may have been affected by the Project. The number of participants who spent an average of 5 to 15 hours online per week had doubled to 60%, compared to the pretest. Additionally, the number of infrequent users of the Internet, who spent less than 5 hours online per week, and the number of most frequent users, who spent over 15 hours online per week, had decreased by 10.2% and 14.5%, respectively (Figure 12).

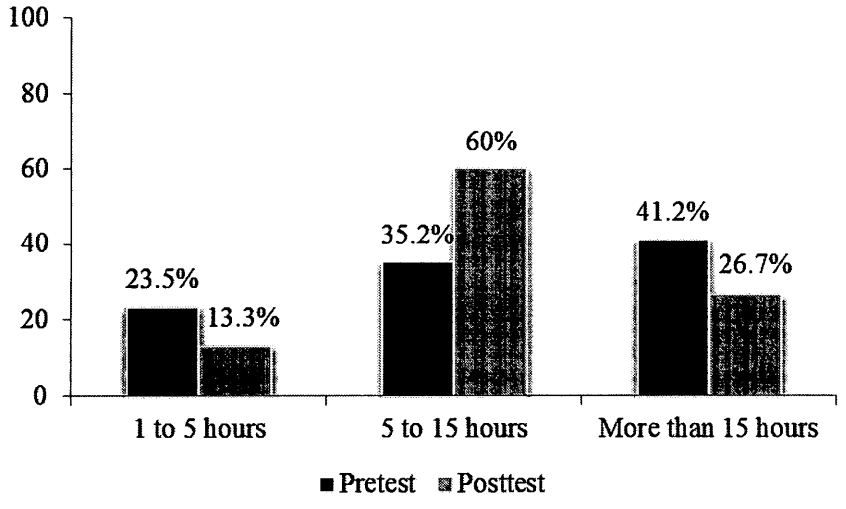

Figure 12. The percentage of time spent online as reported by participants ($N = 15$) during pre- and posttest survey administrations.

Repeated-measures ANOVA revealed a non-significant treatment effect on students' self-reported Internet usage, $F(1, 14) = .65$, $MSE = .53$, $p = .433$, $\eta = .04$. These findings indicate that students did not significantly increase the amounts of time spent online because of the Project's particular emphasis on web-mediated activities. On the

contrary, students tended to use the Internet moderately and thus their learning was not put at risk because of Internet use.

During the Web Video Project, nearly 60% of participants reported that they accessed video sharing websites for browsing and viewing web videos regularly (Figure 13). Almost 30% of the participants searched video sharing websites on a daily basis. Only a few participants (11.76%) visited video sharing websites infrequently. Most of the students (84.6%) self-reported that they predominantly used YouTube for the Project, while other video sharing platforms (such as EduTube, MetaCafe, TeacherTube, and Viddler) were reported only by two most dedicated participants.

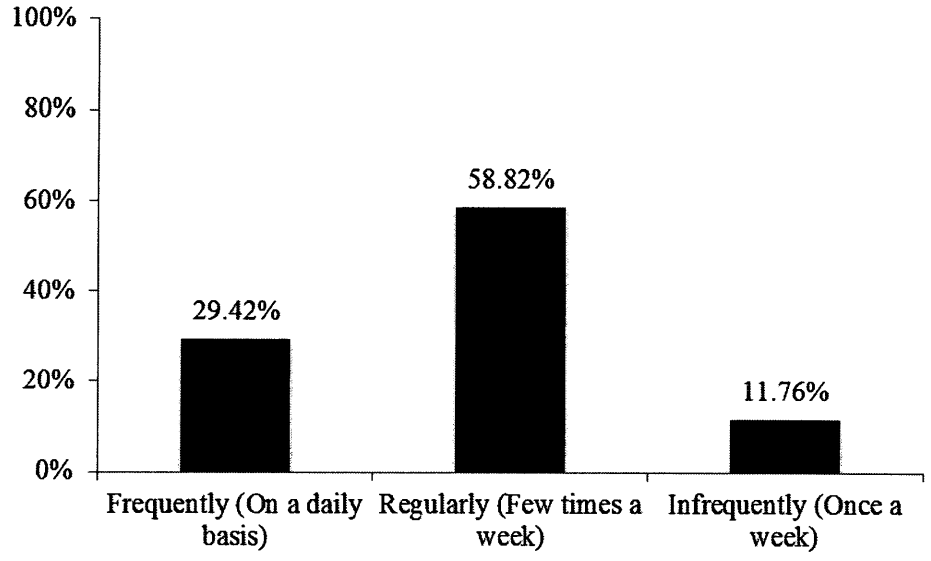

Figure 13. The percentage of time spent on video sharing websites as reported by participants ($N = 15$).

Participants' self-assessment of digital media skills. Since students' progress in completing the project assignments was dependent on their proficiency in using digital media technologies, the analysis of self-reported data on student preparedness for web video mediated learning was included in data analysis and hypothesis testing. The results of repeated-measures ANOVA showed that 8 of the 10 digital media skills were significantly affected by the research treatment (see Table 27).

Table 27

Repeated-Measures ANOVA for Self-Reported Proficiency in Digital Media Use and Production

Measures	Estimated marginal means		F	p^a	η
	Pretest	Posttest			
Search the Web for information using search engines	3.67	4.33	2.26	.155	.14
Locate necessary information on the Web	3.80	4.33	2.32	.150	.14
Create and contribute to a blog	2.07	3.73	17.5	.001	.56
Image search using web search engines	3.73	4.53	8.19	.013	.37
Video search using web search engines	3.53	4.13	4.30	.057	.24
Video search using video sharing websites	3.47	4.13	6.09	.027	.30
Embed web video into a blog	2.00	3.53	12.43	.003	.47
Produce a digital video	.80	3.00	38.50	.000	.73
Upload digital video to the Web	1.13	3.07	17.47	.001	.56
Use media editing programs	1.40	3.20	36.98	.000	.73

Note. $N = 15$. Based on 5-point scale ranged from 1 (*extremely poor*) to 5 (*excellent*).
[a]Adjustment for multiple comparisons: Bonferroni.

The univariate ANOVA was followed up with MANOVA, which revealed significant effects of the Project on participants' digital and social media skills, $V = .93$,

$F(1, 14) = 6.69, p = .024$. Evidence appears to support the hypothesis (H_3) as students' proficiency in digital media use and production significantly increased as a result of their participation in the Project.

Qualitative data analysis may provide a number of explanations for this increase. First, a significant improvement in students' digital media use and production skills may have been facilitated by the implementation of weekly hands-on technical training as part of the Web 2.0 Boot Camp. Second, participants expressed a willingness to learn emerging digital media technologies in order to succeed in the Project; this willingness may have been another contributing factor. Third, the absence of technical complexity that often characterizes Web 2.0 technologies may have smoothed the way for students to perform their technology-mediated tasks. Specifically, a large number of participants noted in their written comments that most of the Web 2.0 technologies they used in the Project provided them with straightforward technological interactivity, including user-friendly interfaces, clean and consistent website layouts, and simple functionalities (e.g., one-click or drag-and-drop operations).

Participants' perceptions of video-enhanced blogging. During the video-enhanced blogging assignment, participants worked individually to reflect on assigned scholarly articles and share their thoughts in a blogging environment. On a weekly basis, students were expected to produce reflections supported by a relevant user-created web video (see Appendix O). In addition to posting their own blogs, students were asked to comment on their peers' entries in a constructive way. The perceived impact of embedding a borrowed web video into a blog was assessed through two survey questions

pertaining to: (a) participants' motivations for selecting a web video germane to the discussion of the assigned reading, and (b) their perceptions of the learning benefits of video-enhanced blogging activity.

Factors affecting participants' decisions to appropriate web video. The participants appeared to have a positive response to all of the decisive factors contributing to their web video appropriation task, which entailed locating a user-created web video relevant to the weeks' assigned readings. The results of rank order analysis indicated that most participants (76%) selected an appropriate web video clip that conveyed a sense of real-life situations, had substantial relevance to the week's topic, and spoke to the assigned readings (see Table 28).

Table 28

Posttest Rank Analysis for Factors Influenced Students' Choice of Web Video for Video-Enhanced Blogging

Measures	*M* (*SD*)	Ranking[a]
Relevance of the video to the weekly topic (e.g., assistive technology, web 2.0 ethics, e-portfolio)	4.12 (.93)	2
Relevance of the video to the content of the assigned article	4.06 (.90)	3
Video illustrates one of the concepts depicted in the scholarly article.	3.82 (.88)	4
Video represents real-life situation.	4.18 (.95)	1
Video represents an example of practical application	3.82 (.95)	4
Video is controversial and challenges the discourse of the article	3.18 (.88)	6
Video is enjoyable to watch regardless of whether it is related to the scholarly article.	3.41 (.80)	5

Note. Based on 5-point scale ranged from 1 (*not at all important*) to 5 (*extremely important*).

[a]The ranks are assigned to posttest mean scores (importance index) that are sorted out in descending order.

Qualitative data analysis of interviews gave further support to evidence produced by the posttest survey, which revealed students' selection of web video to be predicated on the video's practical relation to the issues raised in the week's readings:

> When I think of video, I'd like to pick one specific topic and find video…for instance, there was an assistive technology article and within it there were three or four different tools…I would pick one tool and try finding a video about that tool. I would pick a video that would give me an intro to assistive technology that is more practical was just trying to highlight one aspect of it and find a video that is pertaining to that, and obviously connects the two. [*sic*]

Perceived benefits of video-enhanced blogging activity. In the posttest survey, participants were asked whether they agreed or disagreed with a series of statements about the impact of web video on their learning and the development of their understanding of subject matter. The results (see Table 29) indicated that over 80%of the participants were quite positive about the value of adding borrowed web video to facilitate their comprehension of the assigned scholarly readings. Among the benefits of the video-enhanced blogging activity, the top three functions of web video appropriation in facilitating learning were revealed: (a) an opportunity to consider issues uncovered in the readings more deeply, (b) an opportunity to make new connections to the assigned readings, and (c) an opportunity to engage in active and thoughtful reading.

Table 29

Posttest Descriptive Analysis for Perceived Effects of Video-Enhanced Blogging on Learning

Measures (Video-enhanced blogging helped me...)	*M (SD)*	Strongly agree (%)				Strongly disagree
		1	2	3	4	5
...develop position on topic studied	1.88 (.78)	29.4	58.8	5.9	5.9	0
...question knowledge (ideas, perspectives) presented in articles	2.24 (.97)	23.5	41.2	23.5	11.8	0
...engage in thoughtful reading (i.e., reflect on what I read)	1.82 (.81)	35.3	52.9	5.9	5.9	0
...appreciate others' opinions and perspectives	1.88 (.86)	35.3	47.1	11.8	5.9	0
...make new connections to assigned readings	1.82 (.88)	41.2	41.2	11.8	5.9	0
...take issues to a deeper level	1.71 (.85)	47.1	41.2	5.9	5.9	0

Data analysis from interviews and personal statements identified three ways in which web video appropriation may have helped students increase their understanding of the underlying complexity of issues or concepts presented in the assigned articles: (a) by stimulating connection-making between textual and visual information; (b) by relating abstract concepts from class readings to practical real-life situations, thereby rendering them concrete, specific, and applicable; and (c) by allowing for the negotiation of multiple perspectives pertaining to the article. Some of the participants' reactions are worth noting in order to illustrate these implications of web video appropriation:

a) "I start by reading an article...when I get it down in print that helps me focus on what are my main points. That helps me jell in my mind. While I

watch the video…I make notes on key points…and then I've got my written summary and my key points…and I blend them together." [*sic*]

b) "That little video combined with the article, while it gave me a really good background and understanding of what eportfolio is…but the video added a usability factor…and I see…it dawned on me…I could've put all of this on eportfolio from my other class. And then enthusiasm came out. The web video came in at the end and communicated to me, gave me a lot of ideas what I can do, use it, and apply in my own life by seeing how other people doing it. I guess that is learning about modelling the others." [*sic*]

c) "When I summarize the article, I need to have a video that connects the two. I need to read the article and watch the video, and then do the summary and reflections. I think video enhances the article and provides a different perspective or light to it." [*sic*]

The qualitative data analysis of participants' reactions to the quality of their peers' reflective blogs showed that students were quite satisfied with the quality of postings: "Very good [quality], we have really smart people in our class." Analysis of participants' self-assessment reports, coupled with instructors' observations, confirmed this finding. Thus, nearly 55% of the participants fell under the 80-90 range of the 100-point self-assessment rubric and 40% of the participants assessed themselves within the 95-100 range of the rubric. In addition, participants provided constructive self-assessment reports focusing on the rubric criteria when justifying their grade for the assignment. About 30%

of the participants pointed out their weaknesses and remarked upon the room for improvement in the future.

Overall, statistical and qualitative analysis indicated that the appropriation of user-created web video to support students' reflections appeared to facilitate students' engagement with the assigned readings, and to provide them with the opportunity to engage in critical evaluation of the material while exploring alternative aspects embedded in user-created web video.

Participants' perceptions of web video production. Another critical part of the Project was the creative production of students' own web videos. Students were asked to design, create, and publish on the Web their own digital video composition reflecting their understanding of the selected topic related to assistive technology. The video needed to have a purposeful narrative and attractive look, incorporating multiple modes of representations, such as images, fragments borrowed from existing web videos, authentic video footage, audio, and text (see Appendix P). Overall, the web video production assignment involved the following set of tasks: (a) selecting a topic, (b) scripting the design, (c) filming original video footage and remixing/reusing other videos; (d) editing video using Microsoft Windows MovieMaker; and (e) sharing the resulting digital video artefacts via YouTube and Blogger platforms.

At the posttest, participants were asked whether they agreed or disagreed with a series of statements about the impact of web video production on their learning and the development of their understanding of subject matter. The results (Table 30) show that nearly 88% of the participants agreed that the ability to share digital video artefacts over

the Web provided them with an opportunity to explore their classmates' reflections on the course material. In addition to appreciating the chance to explore the ideas conveyed in classmates' web video artefacts, 80% of participants valued the opportunity to have their own voices heard in online communities through their visual narrations. The third advantage of web video production activity was the opportunity it provided for students to clarify ideas and knowledge about the topic while planning, designing, editing, and producing a web video narration.

Table 30

Posttest Descriptive Analysis for Perceived Effects of Web Video Production on Learning

Measures (Being able to produce and share web video…)	*M (SD)*	Strongly agree (%)				Strongly disagree
		1	2	3	4	5
…gave me a voice within our learning community (and beyond)	1.88 (.86)	35.3	47.1	11.8	5.9	0
…helped me clarify my ideas/knowledge about the topic	1.82 (.81)	35.3	52.9	5.9	5.9	0
…enabled me to share my ideas with others	2.06 (.97)	29.4	47.1	11.8	11.8	0
…enabled me to see how differences of opinion were presented in my peers' videos	1.65 (.70)	47.1	41.2	11.8	0	0

When the participants were asked to reflect on the impact of web video production activity on their learning, they commented positively on how production of their own web video had reinforced their understanding of the topic (i.e., assistive technology). The frequency distribution of participants' responses (Figure 14) showed that the production of web video expanded students' practical knowledge of the topic,

advanced their conceptual understanding of the topic, and engaged them in actual real-life practices while they collected footage for their video. Some participants indicated that they enjoyed the web video production experience because they received deep gratification from being able to share their knowledge and experience with a larger audience in a tangible form. Interestingly, the perceived implications of web video production recalled most of the implications of video-enhanced blogging as reported earlier.

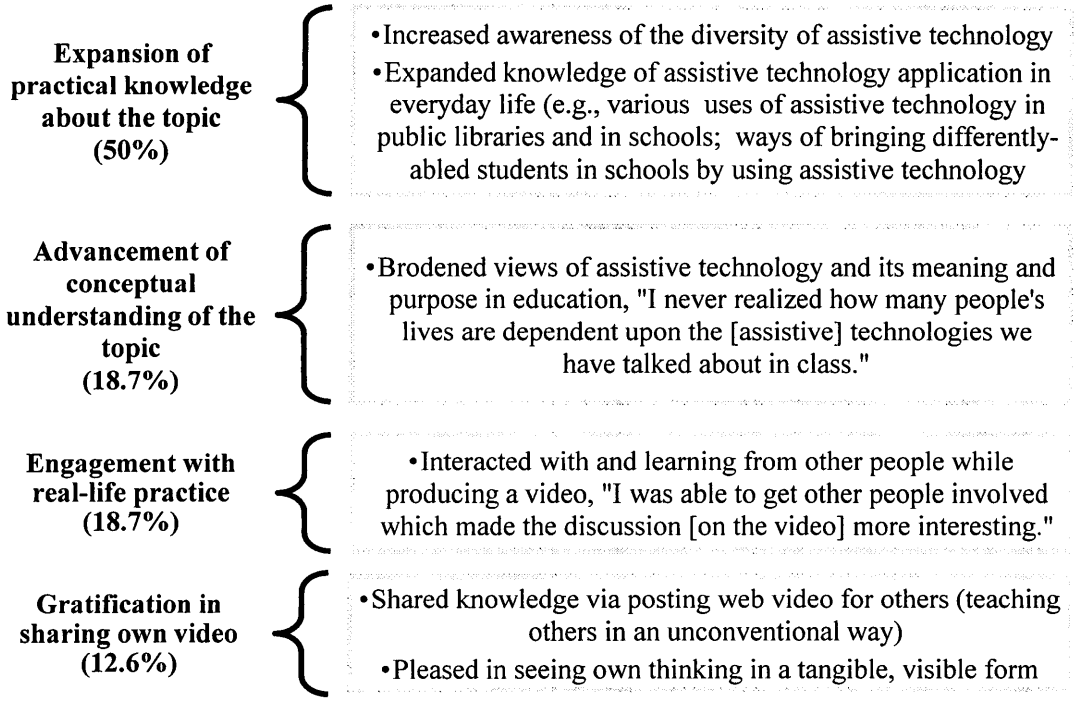

Figure 14. Percentage frequencies of thematic units obtained in qualitative data analysis of participants' responses to a survey question, "How much did your involvement in producing your own video reinforce your understanding of assistive technology?"

Participants' perceptions of the impact of the Project. The survey sheds light on the range of ways in which participants conceived of the learning process. The participants were provided with a list of the seven most commonly perceived meanings of learning behaviours (Rogers, 2002) and were asked to rate each of the statements in terms of how close they were to the respondent's own thoughts on learning. The comparison of mean scores indicated that participants were in close agreement on all of the operational meanings of learning behaviours suggested in the survey (Table 31).

Table 31

Posttest Descriptive Analysis for Students' Conceptions of Learning

Measures	*M (SD)*	Very different (%)				Very close
		1	2	3	4	5
Making sure I remember things well	4.06 (1.14)	5.9	5.9	5.9	41.2	41.2
Developing as a person	4.18 (1.13)	5.9	5.9	0	41.2	47.1
Building up knowledge by acquiring facts and information	4.00 (1.27)	5.9	11.8	5.9	29.4	47.1
Using all my experience in life	4.24 (1.15)	5.9	5.9	0	35.3	52.9
Being able to use the information I've acquired	4.35 (1.22)	5.9	5.9	5.9	11.8	70.6
Understanding new material in a way that it makes sense to my frame of reference	4.18 (1.19)	5.9	5.9	5.9	29.4	52.9
Seeing things in a different and more meaningful way	4.23 (1.15)	5.9	5.9	0	35.3	52.9

Yet, frequency analysis (Table 31) shows that the most common conception was that learning entails the application of acquired information; following this was the perception that learning entails the act of re-using previous life experience; and, finally,

there is the perception that learning entails exploring ideas in different meaningful contexts. The findings show that students may have favoured a variety of ways in which they learn, without highlighting any one particular way of processing information and developing constructions of knowledge. Consequently, this may imply that university instructors face pedagogical challenges and need to apply a diverse repertoire of effective strategies in order to facilitate learning for students with various needs.

Perceived priority of web video for learning. The results of descriptive statistical analysis showed that nearly 60% of participants gave high priority to the use of web video as a knowledge source to supplement the reading of scholarly articles. Further analysis showed that participants preferred "reliable" types of web videos that are produced either by the instructor (76.5%) or established media companies (58.8%) (see Table 32). Similar to enterprise web video, 58.8% participants preferred user-created web video. Despite the fact that most students would still prefer the "reliable" format of web video produced by the instructor over user-created web video, previous evidence suggests that students support user-created web video if it is combined with blogging (see Table 9). One participant's comment is worth noting in this context:

> Being able to see it [lecture material] is just so helpful. It [user-created web video] takes all the scientific jargon out of things and put in layman's terms. It would be beneficial if instructors start using [user-created] web video in their classroom, so when they're teaching those topics, they have something automatically to refer to, to show the students. [*sic*]

Table 32

Posttest Descriptive Analysis for Students' Preferences for Web Video as Source of Knowledge

Measures	*M (SD)*	Least preferred (%)				Most preferred
		1	2	3	4	5
Instructor' produced web video	3.88 (1.22)	5.9	11.8	5.9	41.2	35.3
User-created web video	3.53 (1.12)	5.9	11.8	23.5	41.2	17.6
Enterprise web video (i.e., produced by established media publisher)	3.65 (1.22)	5.9	11.8	23.5	29.4	29.4

Data analysis reveals a major pattern of students' engagement with web video that appears to contradict the leading argument of the Project – that is, that students would prefer user-created video over instructor-produced video. In actuality, if given an option, students would be more likely to take advantage of web video content that is produced or assigned by the instructor rather than exercising responsibility in selecting appropriate user-created web videos to support their learning. Qualitative data analysis suggests that there may have been a number of reasons for such preference: (a) students' reluctance to spend time browsing video sharing websites, which are full of "unfiltered" video content, in order to find a relevant web video; (b) students' unwillingness or lack of skills to evaluate the quality of amateur web video content and then discern its meaning in relation to course materials (e.g., assigned readings); and (c) students' expectations that their instructors will validate and interpret the content of web video, and then make it immediately applicable to the learning situation. These findings appear to challenge

previous evidence on learning opportunities afforded by web video for authentic, relevant experience. In other words, students' passive resistance or perhaps inability (due to the lack of required video searching and evaluation skills) to engage in the process of critical appropriation may have defined their preference for learning content prescribed by the instructor. At the same time, students acknowledged the value of being able to search for web video on their own and determine its relevance:

> What you really do is usually you find something that was, in my opinion, a little simpler than maybe the article would make it sound, and then when you look in the article, Oh, yeah, that what they are talking about." [*sic*]

Perceived risks and benefits of web video for learning. In the posttest survey and interviews, participants were asked if they perceived any risk to their learning with regards to web video, and how they managed that risk over the period of the Project. The results showed that the participants felt that the learning activities mediated with web video might carry an element of risk to their learning (see Figure 15). Only one participant reported that the use of web video in the Project did not pose any threat to the learning process. According to the participants, the risk of integrating web video was characterized mostly as either "minor risk" or "minimum risk."

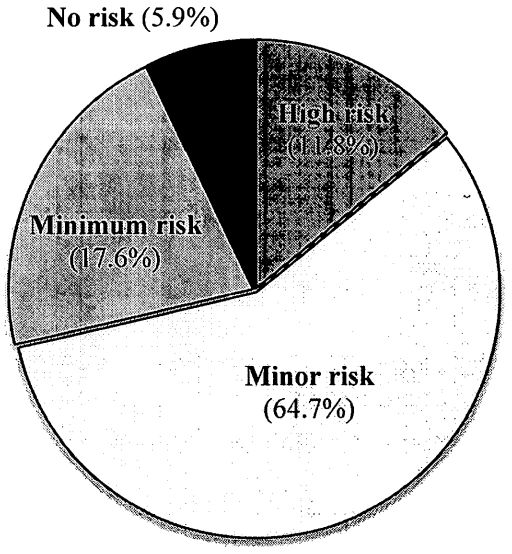

Figure 15. The percentage of participants ($N = 17$) who reported their perceptions of potential risks of using web video for learning.

Participants' major concern was that user-created web video might have low credibility. Participants identified the three most frequent risk factors that could prevent them from effectively using web video for their learning:

- *Time-consuming*: Some participants indicated that they had to allocate more time to learn new technologies, search for relevant video content, and to plan, edit, and produce a new video.
- *Information of disputable content value and/or authority*: Some participants indicated that web video might contain unrefined or inappropriate information that requires careful consideration before its use for study.

- *Privacy concerns*: A few participants noted that they worried about exposing their own thoughts in the forms of blogging or web video.

Most participants appeared to be able to find effective solutions to overcome the obstacles stated above. To increase the efficiency of browsing for an appropriate web video, some participants indicated that they had to work hard on honing their skills of navigating a video sharing website. To reduce the risk of using inappropriate web video content, some participants indicated that they spent time evaluating the quality of the video material before using a video clip for learning: "Before using it, I tried to make an educated decision by determining the accuracy, relevance, and comprehensiveness of information conveyed in a video clip."

Overall, despite participants' concerns about the risks associated with web video use, most of them concurred that the use of web video did not decrease the quality of their learning because the benefits of using web video for the purpose of learning and understanding course material outweighed the risks they experienced. At the same time, since data was collected from a moderate sample of the participants and was subject to a number of limitations (mentioned in Chapter 1), the evidence is insufficient to estimate the actual degree of the risk posed by web video mediated learning.

Participants' satisfaction with the Project. Overall, 70.59% participants would seek out similar web video mediated projects or courses in the future. Participants indicated the major reasons they thought the Project provided a valuable learning experience: (a) the Project made students' learning enjoyable; (b) the Project provided detailed instructions on what to do and how to do it; (c) the Project was focused upon

course material relevant to what students had to learn in the course; (d) the Project afforded students with knowledge of the technologies to be used in their future teaching careers; and (e) the Project allowed students to acquire new skills in using different technologies (see Table 33).

Table 33

Posttest Descriptive Analysis for Students' Satisfaction with the Project

Measures	*M (SD)*	Strongly agree (%)				Strongly disagree
		1	2	3	4	5
I enjoyed working with web video on this Project.	1.76 (1.03)	47.1	41.2	5.9	0	5.9
The Project concentrated on subject matter of the course.	1.76 (.90)	47.1	35.3	11.8	5.9	0
I was provided with detailed instructions on what and how to proceed in the Project.	1.76 (.83)	41.2	47.1	5.9	5.9	0
I have learned new technology skills on the Project	1.64 (.93)	52.9	35.3	5.9	5.9	0
The technologies I used might help me in my future teaching career.	1.65 (.93)	58.8	23.5	11.8	5.9	0

Further analysis of qualitative data sources (Figure 16) echoed the survey findings and revealed that students recognized the full worth of the Project learning experience, recognizing the novelty of web video mediated learning and the potential it offered for student creativity. Furthermore, evidence suggests that some students gained confidence in using web-based technologies and felt more open to changing their learning paradigm based on their experiences of the Web Video Project, while the others still bore discomfort. Some of the comments are worth noting:

- "My expectations have been exceeded. I have encountered no insurmountable problems. It should be mandatory for all students at UWA."
- "I have enjoyed the challenge of making the video. Now, I know how to use Web 2.0 and make a video, but I would like to know [more about] how to use it in the classroom as a teacher, not as a student."
- "At first I assumed that this [Web] Video Project was going to be very difficult but it has not been to my surprise. I have actually enjoyed making the video now because I am a little more technology savvy now." [*sic*]

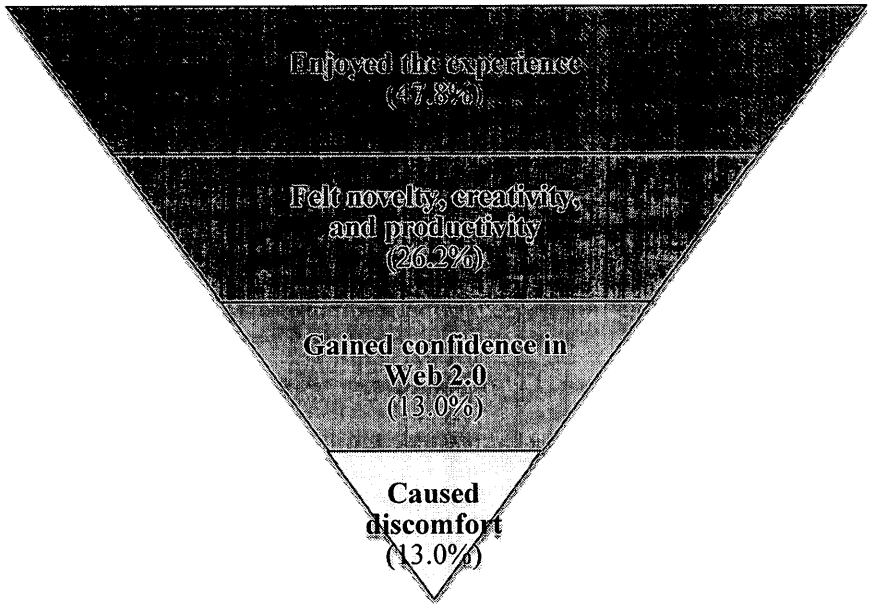

Figure 16. The percentage of thematic units obtained in qualitative data analysis representing participants' overall satisfaction with the Project.

At the end of the Web Video Impact survey, the participants were asked to reflect on key elements they learned during the Web Video Project. The results indicated a positive response to the Project on the whole, and suggested that the participants benefitted from participating in hands-on Web 2.0 technology training and from engaging in web video mediated learning activities (Figure 17). The most frequently mentioned acquired skills were as follows: (a) the ability to appropriate (or "borrow" and embed) existing web videos and to compose one's own web video; (b) a mastery of the techniques for using web video to enhance the learning experience; and (c) an understanding of the Web 2.0 concept and its implications for learning.

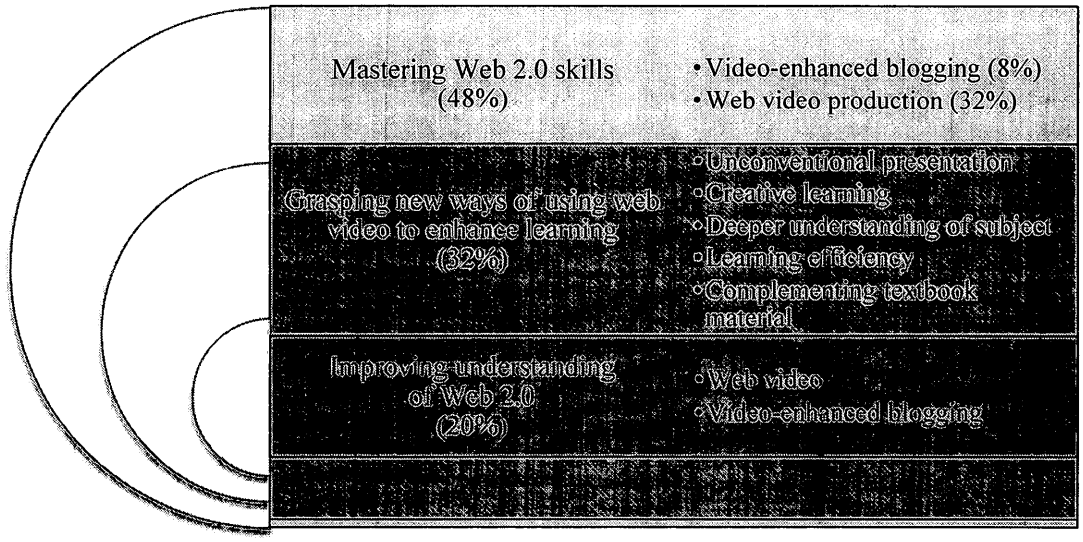

Figure 17. The percentage of thematic units obtained in qualitative data analysis representing participants' major accomplishments during the Project.

Furthermore, the findings suggest that students became interested in using web video in their current learning or future teaching. Analysis revealed that students applied the knowledge and skills they gained during the Project to other courses they were taking, and that some of them adapted their Project experience to their own teaching (Figure 18). Qualitative data analysis suggests that the participants developed new understandings of the nature of web video and might develop new mental models of what it means to learn with web video.

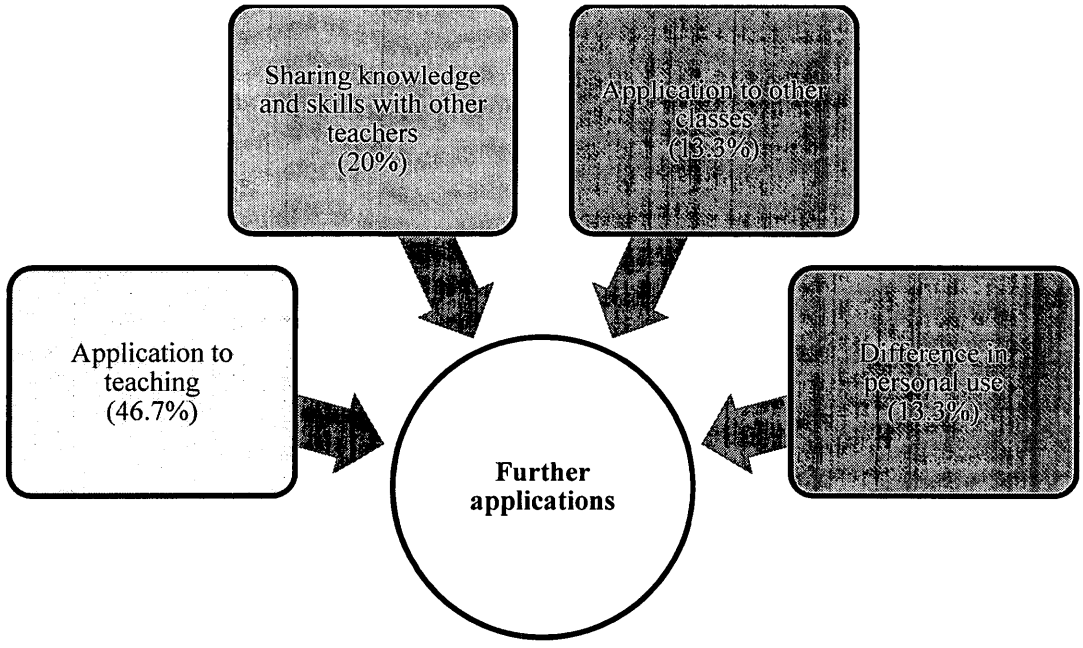

Figure 18. The percentage of thematic units obtained in qualitative data analysis representing participants' further application of knowledge and skills acquired during the Project.

Instructors' standpoints on the implications of the Project. Analysis of the posttest interview with course instructors suggested three patterns in their perceptions of the implications of the Project as an innovative pedagogical strategy. First, both instructors agreed that the Project initially caused frustration. One instructor noted that it was a big concern for her, and that she received a number of complaints from students in relation to the Project's activities. Most of the students' frustration, in their opinion, was attributable to the short time period allowed for such an intensive Project, a restriction that resulted in a lack of time to absorb the material and the technology: "If we have had 10 or 12 weeks to do this instead of six weeks, it might have not been quite as stressful for the students." This observation recalls previous findings uncovered during student surveys and qualitative analysis. As students progressed through the Project, instructors noticed that students were overcoming these difficulties and that their stress levels decreased as they began realizing the value of what they had been doing. Instructors' assertions about students' continuous improvement were based on classroom observations, affirmative email communications they were receiving during the Project, and, of course, on the evaluations of students' Project assignments. The instructors also emphasized that all the students selected appropriate web video for their assignments, and that the videos were clearly related to the articles and to students' reflections thereon.

The second pattern was related to the students' use of self-assessment rubrics. Instructors considered the way students had applied the rubrics and assessed their own accomplishments. First, they indicated that students used the rubrics as a guide, implying that the rubrics steered students through the learning process, established the

requirements that needed to be met, and specified the criteria for assessing whether a student had arrived at an appropriate level of proficiency when the assignment was completed. For instance, several students communicated to one of the instructors that they had reviewed the rubric while working on the assignment to check whether they satisfied the requirements. One instructor noted that students emailed her with the grades they imagined they had earned, which ran between 70 and 80 points out of 100.The instructors assumed that students applied the rubrics in a formative rather than summative fashion, thus enabling them to evaluate what they had done and to justify their accomplishments in accordance with the rubric expectations. They also observed that students felt comfortable and sheltered from the instructor's absolute authority, a factor that is often inherent in the grading of course assignments.

Lastly, the third pattern discovered during the interview is that the Project changed instructors' beliefs about Web 2.0 technology and its use in the classroom, and prompted them to consider modifying their courses in the future. In particular, they stressed the learning value of purposefully using video-enhanced blogging to enable student-driven and meaningful appropriation of web video in combination with scholarly knowledge sources, thereby facilitating authentic and deep learning. In addition, one instructor noted that experiencing this kind of blogging firsthand could promote prospective teachers to employ this pedagogical practice in their future teaching. This evidence supports the findings derived from previous studies (Heo, 2009; Masats & Dooly, 2011; Zhao, 2010) and strengthens the argument that the instructional methodology of technology-mediated learning should be shifted to focus more on

students, allowing them considerable latitude in directing their own learning and constructing knowledge through different sources. At the same time, instructors should be expected to facilitate student learning with a structured support and to supply students with technology and course materials that are appropriate, useful, and relevant to their learning needs and the academic expectations of university education.

4.5 Chapter Summary

This chapter discussed research findings concerning the impact of web video on student learning in accordance with the research questions that guided the empirical investigation. Overall, the findings indicate the effectiveness of the Web Video Project. Analysis suggests that the participants gained knowledge of web video and felt more competent in the subject area as a result of the Project. The overall evidence suggests that university students were supportive of the learning activities mediated with web video use and production. A summary of key research findings corresponding to research questions 1, 2, and 3 are shown in Tables 34, 35, and 36, respectively.

Table 34

Summary of Key Research Findings: Research Question One

Measures	Key Findings
Students' concerns about web video as an innovative technology	• Decrease of awareness concerns => acquiring of knowledge of web video (sig.) • Changed from low to higher stages of concern
Students' levels of use of web video	• Increased from low to high levels of use (consistent with concerns) • Reaching higher levels of use (routine, refinement, integration, renewal)

Table 35

Summary of Key Research Findings: Research Question Two

Research Variables	Key Findings
Major affordances of web video integration	• Web video and blog are indispensable to learning (sig.) • Beneficial web video attributes (user-created content, accessibility and instant gratification, multimodality [sig.], diversity of video content, and the possibility for personalisation and customisation) • Opportunities for content contextualization (real-life examples, visualisation, content exploration in context, multiple perspectives on issues [sig.]) • Opportunities for student-driven learning (active participation, learning from others, making learning challenging [sig.]) • Improves achievement (self-report)
Major constraints of web video integration	• Technology challenges (browser incompatibility, time-consuming video streaming) • Deficiency in web video searching skills, which was rectified upon Project completion (sig.) • Lack of conceptual understanding of web video and anxieties about the accuracy and reliability of its content • Minor learning challenges (time constraints)

Table 36

Summary of Key Research Findings: Research Question Three

Research Variables	Key Findings
Proficiency in Web 2.0 media skills	• Improved proficiency in digital media use and production skills (sig.)
Impact of web video appropriation (i.e., video-enhanced blogging)	• The utility of "borrowing" web video lies in real-life representation, illustration of practicality, and substantial relevance either to the topic or assigned readings • Appropriation of web video enables students to take issues to a deeper level, make new connections, engage in deep thinking and reflection, and negotiate multiple perspectives • Web video takes high priority when developing understanding and building knowledge of subject matter; if given a choice, students opt for instructor-produced or assigned video • Video-enhanced blogging facilitates composing online reflections and deeper learning, adds visual dynamic to the text, and makes it easier for readers to connect with the blog • Analysis confirmed positive perceptions of video-enhanced blogging activity and gave evidence of the high quality of blogs
Impact of web video production	• Production of web video enables students to see differences of opinion, clarify their own knowledge creation and thinking, and have their own voice • Web video composition increases understanding: expansion of practical knowledge, advancement of conceptual understanding, engagement in real-life practice, and gratification in sharing web video • Preference for working individually when producing web video • Usefulness of web video proposal and self-assessment rubric
Implications of Web Video Project (i.e., effectiveness of the Project on the whole)	• Moderate use of the Internet and video sharing websites • Key pedagogical achievements: acquiring web video skills ("borrowing" and composition); acquiring an understanding of user-created web video; grasping new ways of using web video for learning • Upon completion, students reported that they applied acquired skills and knowledge of web video to other courses, their teaching, and informal learning beyond the scope of the course • High levels of satisfaction with the Web Video Project

CHAPTER FIVE: DISCUSSION

The research conducted in this study focussed on the application of the "Learning with Web Video" Model in the context of one of the classroom-based courses in a graduate education program. Two learning scenarios, which were incorporated in the course syllabus in the form of the Web Video Project, were under investigation: (a) the critical appropriation of user-created web video content in the form of video-enhanced blogging and (b) the creative production of students' own web video artefacts. This study intended to investigate the effect of the Project on students' perceptions of learning and to uncover whether the proposed Model has any ability to address the appropriation of incorporating user-created web video content in the learning process. Specifically, this study sought to answer three research questions: (a) How did students' concerns about web video evolve over the duration of the Web Video Project? (b) What were the affordances and constraints of integrating web video into a traditional classroom-based course? (c) How did web video use and production facilitate student learning? Because no previous study has examined the influence of user-created web video as an integral part of academic curricula, it was of particular interest to explore its influence from a students' perspective.

Multiple sources of evidence were collected from web-based surveys, interviews, and participants' learning artefacts. The survey questions were either adapted by the researcher from previously validated measuring instruments or designed by the researcher using separately available survey instruments to measure students' perceptions of technology-mediated learning and their satisfaction with Web 2.0 and video technology.

The interview questions were aligned in congruence with survey questions to complement statistical evidence and contextualize new aspects of web video mediated learning that might emerge during the study. Statistical data analysis involved the descriptive test statistics and the repeated measures design. The findings reported in the previous chapter suggest that the majority of students attached greater importance to web video and blogging as a result of their participation in the Web Video Project. Most of them attributed their satisfaction with applied web video use and production in their learning, and perceived a beneficial effect of the Project on their performance and learning in a university classroom. The evidence reported indicates the Project's positive influence on students' understanding of learned concepts and their ability to construct new knowledge using information obtained from different sources – assigned peer-reviewed articles, self-selected web videos, and personal experience.

In the first three sections I provide details about how the results helped to answer the major research questions formulated in this study. The results are discussed in terms of the extant literature and the situated learning framework streamlined through the proposed model for web video mediated learning. In the following section, I offer recommendations for further research. I end the chapter by drawing conclusions and discussing the potential implications of the present study for approaches to more effective pedagogy in higher education

5.1 Students' Concerns about Web Video Integration

The first research question examined the change in students' concerns about web video integration during the Web Video Project. To answer this research question, I used

the findings derived from statistical analysis of the data collected from the Concerns and Levels of Use survey that was administered before and after the Project. The survey data analysis suggests a number of patterns in the concerns that students developed over the course of the Project.

The first pattern of students' concerns about web video. The participants increased their knowledge of web video and improved their confidence and skills in using web video as an innovative technology in a manner that facilitates their learning and interaction with other students. Although Dobbs (2005) found significant differences between various stages of concern within the Concerns Based Adoption Model (see Chapter Two), this study revealed that the Web Video Project made significant statistical difference only in the stage of awareness concerns. A number of factors may have contributed to the fact that the Project did not appear to change significantly the variation of students' concerns about web video. First, the timing of the Project was of limited duration. Consequently, students were given a short period of time to complete the project assignments, become familiar with a new learning approach, and master the extensive set of emerging technologies they had to apply for learning. Second, as reported by some participants and observed by the instructors, the feelings of anxiety and increased stress levels, precipitated by the shortage of time and the intense pace of the Project, may have affected the participants' perceptions.

The second pattern of students' concerns about web video. Data analysis revealed that, by the end of the Project, the participants appeared to cope with the management of learning tasks involved in web video mediated activities. Statistical

analysis of participants' self-assessment of Web 2.0 skills suggests that the Project was most likely to increase students' proficiency in appropriating the existing web videos, and in composing their own web videos.

A number of factors may have contributed to participants' decreased level of management concerns scores and significant improvement in their self-reported Web 2.0 skills. First, students' willingness to learn how to use diverse Web 2.0 technologies to facilitate their learning and succeed in the Project may have been a contributing factor. Second, students had an opportunity to participate in the Web 2.0 Boot Camp in-class activities designed to provide them with "just-in-time" personalized technical support and hands-on experience with Project-related technologies. Such participation may have helped students not only to master technical skills, but also to learn how to coordinate their thinking processes with the technical process of web video appropriation and production. Students were provided with immediate support either in the classroom or via email, thereby minimizing disruption caused by technology and allowing them to concentrate more on their learning tasks. Third, the provision of the Project Learning Guidelines and self-assessment rubrics for each assignment may have enabled the participants to follow the direction for the assignment and complete it according to the expectations set in the guidelines. In addition, the researcher sent out weekly reminders to each student by email that may have helped students monitor their weekly progress and better regulate their learning. The previous research on the stages of concern suggests that students who are exposed to educational innovation should be guided during the adoption

process so that their concerns about the innovation may be addressed immediately in the classroom and thereby minimized (Bailey & Palsha, 1992; Hall & Hord, 1987).

The third pattern of students' concerns about web video. The participants continued to demonstrate high levels of personal and impact concerns about using web video at the end of the Project. For instance, students were interested in how best to use web video to increase the benefits of learning (i.e., consequence concerns), to cooperate with other students in class (i.e., collaboration concerns), and to explore further affordances of web video for learning through convergence with other technologies (i.e., refocusing concerns). Such high intensity of personal, consequence, collaboration, and refocusing concerns at the pre- and posttest administration may be explained by the short duration of the Project and its novelty and instructional richness (i.e., the diversity of learning activities and technologies used within a six-week period), suggesting that students did not have enough time to practice their technical skills and strengthen the social media competencies needed to maximize the benefits of using web video technology for learning (i.e., for reflection, composition, and comparison activities). This observation is supported by qualitative data provided by participants during midpoint feedback and interviews. In this regard, the most representative comments were as follows:

- "I would not say that I am having any challenges it's just that we are moving so fast at times it is difficult to keep up."
- "We need to slow down and make sure that we have an understanding as to what it is we are doing."

- "About the only problem I have majorly found is find [*sic*] time to get all this done. The fast pace in the class [is a challenge]."

Overall, a few students who entered this Project were aware of web video technology and possessed appropriate technical and media skills. Throughout the Project students felt a need to learn more about the educational applications of web video in order to enhance their learning. That is, students had low awareness and management concerns and a high level of informational, personal, consequence, collaboration, and refocusing concerns. Following descriptive and qualitative analyses, evidence suggests that by the end of the Project most students had gained knowledge and understanding of web video and felt comfortable using it. A third of participants were interested in higher levels of web video use to maximize its effect on their learning and sought alternative solutions to web video use (e.g., a combination of web video with other technologies) in order to achieve increased impact on their learning.

5.2 Students' Perceptions of Web Video Affordances and Constraints for Learning

The second research question examined students' perceptions of web video affordances and constraints for learning during the Web Video Project. To answer this research question, I used the findings derived from statistical analysis of the data collected from the Web Video Affordances and Constraints survey that was administered before and after the Project. I also used illustrative examples derived from the participants' responses to open-ended survey questions, interview transcripts, and the analysis of participants' artefacts submitted during the study.

Web video affordances for learning. The findings of this study suggest that students perceived web video and its combination with blogging technology as indispensable to their learning. In particular, qualities of web video such as multimodality (i.e., digital capturing and embedding), entertainment, and varying degrees of oversight of content production received an overwhelming positive response from participants by the end of the Project. Furthermore, the participants used increasingly more descriptors indicating the beneficial attributes of web video, such as "user-created content," "diversified representation of information," "instant gratification," and "easy searchability." When comparing emerging web video to previous video technologies, students highlighted four major distinctive attributes of web video technology: (a) accessibility that included easy and immediate access to video content provided by video sharing websites; (b) customized searchability that included the ability to search for relevant web video according to a student's individual needs; (c) the diversity of web video formats and content which represent both professional and "unfiltered" perspectives; and (d) the multimodality of web video artefacts.

In response to Masats and Dooly's (2011) call for more research to understand better the affordances of video technology for learning, this research identifies two large groups of web video affordances for learning through a situated cognition lens: opportunities for content contextualization and student-driven learning. These findings were supported and acknowledged by the participants in this study. Furthermore, in analyzing participants' perceptions about web video affordances for learning, the analysis indicated that the Project came very close to meeting the essential characteristics for

authentic learning, as described by Herrington et al. (2003). It possessed such qualities as real-world relevance, ill-defined challenges, sustained investigation, the use of multiple sources, multiple perspectives, integrated self-assessment, and confronting the complexities and ambiguities of real-world professional practice (see Table 37).

Table 37

Comparison of Participants' Perceived Web Video Affordances for Learning with Characteristics of Authentic Learning

Characteristics of authentic learning (Herrington et al., 2003)	Web video affordances (as reported by participants)
• Exploration of the task from multiple perspectives, using a variety of sources	• Opportunities for learning the subject matter from multiple perspectives and from other people
• Real-world relevance rather than decontextualized tasks	• Opportunities for visualization and learning in context
• Tasks that are ill-defined and open to interpretation	• Opportunities to make learning challenging
• Making one's own choices and reflecting on learning	• Opportunities for active, student-driven participation

Overall, participants in this study appreciated the learning potential of web video attributes, such as user-created content, accessibility, instant gratification, multimodality, diversity of video content, and the possibility for customization. Additionally, the Project helped students to apply these qualities to learning in multiple situations even when they failed to comprehend fully the affordances of web video. Barab and Roth (2006) posited that, in learning contexts where students develop their understanding of the affordances

of resources (in this case, the affordances of web video) and the skills to apply them in constructing knowledge and understanding, new ways of engagement with the real world can emerge, replete with contextual particulars: "education should stimulate an appreciation for, and desire to be part of, contexts through which these networks take on meaning, as well as equipping students so that they can create new and useful affordance networks" (p.11). In this study, the participants appeared to perceive web video as representing different contexts of knowledge and individual perspectives conveyed through networks of user-created content, and recognized it as an enhancement to learning the formal, decontextualized content of the course material within academic networks of scholarly resources.

Web video constraints for learning. As previously noted, the Project's focus was on user-created web video. The data analysis suggests that the main constraint on student learning in the Project came from students' lack of conceptual understanding of user-created content. During the study, the participants communicated their anxieties about the credibility of video producers and the accuracy of video content available on the Web. After their participation in web video mediated activities, students' perceptions of user-created video content and the negative implications for learning posed by potentially low content quality slightly increased, in contrast to their perceptions of other types of constraints. Given student concern over content oversight on video sharing websites, it is important for university educators to teach students the strategies and skills needed for evaluating the accuracy and reliability of user-created web video content. In this way, the university has an opportunity to contribute to the development of 21st-

century skills, and to ensure the high quality of university instruction when integrating user-created content.

Since the participants worked with a diverse range of web technologies and media production software, they perceived most of their constraints as lying with the operation, usability, and application of the technologies in relation to their learning tasks. In particular, the availability of multiple technologies and video sharing websites was the second major constraint on student learning. In this regard, the participants reported overwhelmingly the technical barriers to their learning, including (a) technology incompatibility (such as incompatibility of video formats with MS MovieMaker software; difficulty to download or embed web video when using different web browsers) and (b) the insufficiency of bandwidth and Internet speed at some homes to support the streaming video experience. The rapid growth of video sharing websites became another roadblock that may have made students' searches for web video more difficult and discouraged some from integrating web video into their learning. For instance, students demonstrated a lack of web video navigation skills and experienced difficulty in searching effectively for a relevant web video program. It is important to note that all the students were provided with "on-the-fly" advice and personalized assistance on how to operate different technologies and devices (e.g., how to convert a video taken using a cellphone or camcorder to an appropriate video file format). It appears that the provision of such support may have contributed to the decreased frequency with which participants reported their perceptions of technical constraints to web video mediated learning at the posttest administration.

With regard to the learning challenges perceived during the Project, the survey analysis indicated a moderate concern about time constraints, lack of instructional support, and lack of confidence in using web video. It may be that having adequate technical support and weekly reminders during their work on assignments led to students avoiding serious difficulties that could have discouraged them from integrating web video into their learning. While a handful of students indicated in their responses that they required extra time to complete their project assignments, most of their frustration arose from the stringencies of a fast-paced learning environment and a very short time period for such an intensive Project. The findings of previous studies examining web video use and production (Burke et al., 2009; Lazarus & Olivero, 2009) have also indicated that students felt concerned about time-consuming learning activities. Additionally, the survey analysis showed that one participant's experience was anomalous in relation to those of the majority of students who participated in the Project. In the posttest administration, this person indicated disagreement on most survey items thereby signifying dissatisfaction with the learning experience generated through the use of web video. This individual had earlier expressed frustration with and long-time resistance to technology, factors which may account for an unchanged perception of web video mediated learning in pre- and posttest responses.

Further similarities were found between this study and previous work by researchers (Burke et al., 2009) who identified the lack of video search skills and issues of video content reliability as being major constraints on students during their learning. Based on data analysis, the current study reinforces previous findings and suggests that

providing students with "just-in-time" support and hands-on training does much to improve their searching and video evaluation skills, thereby minimizing unnecessary expenditures of time and frustration in video searching or video production tasks.

5.3 Effect of the Web Video Project on Students' Learning

The third research question examined participants' perceptions of the effect of web video use and production on their learning. To answer this research question, I used the findings derived from statistical analysis of the pretest Background and posttest Web Video Impact surveys, and from relevant qualitative data analysis, such as responses to open-ended questions, learning artefacts, and interview transcripts.

Perceived effect of video-enhanced blogging. The analysis of survey data indicated that students felt comfortable with the idea of documenting their thinking in a rich media format and then broadcasting it in the form of video-enhanced blog postings. In particular, the participants noted that video-enhanced blogging gave them opportunity to relate new concepts and ideas acquired from the assigned readings to self-selected user-created web video, and that they were able to do so in ways that built upon their existing knowledge structures and previous learning experiences. For instance, over 80% of the participants were quite positive about the learning value of adding borrowed web video to facilitate their comprehension of the assigned scholarly readings. The participants identified the following three factors as the most important learning benefits of the video-enhanced blogging activity: (a) an opportunity to consider issues uncovered in the readings on a deeper level; (b) an opportunity to make new connections to the assigned readings; and (c) an opportunity to engage in active and thoughtful reading.

When participants were asked about whether it would be easier to blog without embedding the video, most of them agreed that the mechanics of putting reflections on the blog would be easier. However, they stressed that the incorporation of embedded web video lent a further dimension to their text-based reflections, consequently enhancing their learning. Some students noted that the web video enhanced the written text and added vibrancy and visual dynamism that engaged readers. Others observed that video-enhanced blogging was an easy method to enable other students to understand the blog postings. Conversely, some students viewed embedding web video as a sidestep to learning and applying a new concept.

This study reinforces the argument by Sherwood et al. (1987) and Lee (2010), who examined the use of video to facilitate students' comprehension. Sherwood et al. (1987) have concluded that videos provide much richer context and demonstrate particularities better than solely verbal communication, and Lee (2010) argued that pedagogy needs to reduce reliance on textual readings and verbal lectures in order to satisfy a diversity of learning preferences and styles. The Project in this study was designed to engage students in the sophisticated integration of web video and blogging technology with more traditional authority-driven textual discourses of knowledge making (in the form of articles); it was also intended to create room for students to direct their own learning. In effect, evidence suggests that the embedding of web video into blogging appears to serve students not just as an illustration of practical examples of how concepts can be applied to real life, but it also gives them additional cognitive opportunity to integrate new knowledge into existing knowledge structures, to place the

abstract issues they read about into practical context, and to explore new concepts through applying them in authentic situations as represented in web video fragments. These findings thus suggest that participation in video-enhanced blogging activity enables students not only to contextualize theoretical concepts, but also to apply them convincingly by capitalizing on the "borrowed" web video complementing the scholarly knowledge.

Despite the overwhelming use of scholarly resources in university classrooms, students may absorb course material out of context (Bracher et al., 2005), and student learning is generally circumscribed by the instructor (Bassili, 2008; Haase, 2009; Mitra et al., 2010). In particular, Mitra et al. (2010) emphasized that students' attitudes towards video material largely depend on whether the instructor has explained the relevance of the video to the course material. In this Project, students were invested with total accountability for selecting relevant web videos and relating them to the course material. In other words, students were given a certain degree of freedom when selecting web video content so that they could explore a multiplicity of diverse perspectives, and so that they could contextualize (or visualize) theoretical concepts. Interview data analysis showed a common pattern in how the participants produced their video-enhanced reflections. They began by reading the article and composing a brief written summary of its main points. They then selected one specific point from their summary and began their search for a relevant user-created web video. After selecting an appropriate video, they composed a reflection on the article that included discussion of the related web video. I suggest that giving students an opportunity to search for an appropriate web video

enables them to understand better the topic discussed in the article and encourages them to discuss alternative viewpoints encountered during their web video search process. Evidence supporting this argument can be found in student feedback on the study, in which many articulated their appreciation for the opportunity to choose their own web video and determine its relevance to their reflection. At the same time, a couple of students showed resistance towards the "self-directed" appropriation of web video because (a) one student thought that web resources might distract students from using textbooks, library resources, or other tangible learning materials; and (b) another student was convinced that instructors, as authoritative "knowledge holders," should teach on their own without the use of any visual aids.

Additionally, the data analysis revealed that students liked the idea of being able to see and provide feedback on other students' blogs, which provided different perspectives on the same articles. According to students, this exchange would not be possible in a regular classroom discussion. Yet, they pointed out that if the majority of the class is not at the same level of technological skill, comprehension, and reasoning, they would need an instructor to oversee their performance and use of blogging technology. These findings suggest that students had positive views on mutual knowledge construction in a blogging environment, since it enables them to interact in ways outside of the traditional setting of a classroom discussion.

In the extant literature, questions have been raised by instructors and researchers about the quality of video-enhanced reflection as a self-regulated, analytical activity (Kong et al., 2009; McCrory et al., 2008; Mitra et al., 2010; Zhao, 2010). The qualitative

data analysis of students' reactions to the quality of their peers' reflective blogs showed that the participants seemed to be quite satisfied with the quality of postings. In their self-assessment reports on video-enhanced blogging, 95% of the participants assessed themselves within the 80-100 range of the 100-point assessment rubric. Interestingly, nearly 30% of the participants specified their weak points in the assignment. Data analysis indicated that most students felt comfortable making their own work available for others to view. One participant pointed out, however, that it would be difficult to blog publicly had the topics been more controversial, in which an individual had to give demanding stronger opinions. There were also a couple of students who expressed concern about the quality of self-regulated online reflection, noting that they observed some grammar problems and superficial readings and evaluations of the articles. Overall, the participants' high self-assessment of the quality of their video-enhanced blogging may have been attributed to the novelty of the assignment, students' desire to share their ideas with others, and the self-assessment rubric itself providing direction for the assignment and its expectations.

Perceived effect of web video production. Few research studies (Hakkarainen, 2009) have detailed the methods (and their attendant challenges) used by students when designing their video compositions. Analysis of interview transcripts and participants' responses to open-ended survey questions revealed two patterns of students' engagement in video production that provided insight into how the academic application of web video composition might be expanded. First, all but two students chose to compose their own web video individually rather than with a partner. This finding is quite consistent with a

previous study on multimodal composition (Bishop, 2009), in which students tended to approach a digital composition assignment in an individual capacity, rather than opting to share the responsibility and coordinate the tasks cooperatively. The study reinforces Bishop's finding and supports the value of shifting focus to self-regulated video composition assignments, which might engender enthusiasm in students to learn the process of video production, while also providing for creativity and a sense of challenge.

Another trend among most participants was to make use of two features of the Project – a video composition proposal form and a self-assessment rubric – which were given to students prior to the introduction of the web video production assignment. Students seemed to agree that the proposal and rubric helped to direct the technical process of video production, and offered guidance for designing a meaningful video narrative for a particular audience (e.g., determining the style of video to use [opinion-based, documentary, biographical, "how to," investigative, or newscast], the purpose of the video, the approach to scriptwriting). In addition, these features may have helped them anticipate the questions and problems which arose during the Project, and may have provided them with guidance for processing the learning task. Student attention to this particular feature is notable, reflecting a common sense that, in the rush to complete tasks, students are not always supplied with adequate support and provided with conditions in which to process the management of learning tasks on their own. One student comment is worth noting to highlight this issue:

> It was good to have a web video proposal form. It kind of helps you know how to think…Ok, what can I do to have my own video? How can I tie all

> this [various sources of media] together? What's going to lead into this? And then I just sat down and made a list...this is what I want to do, this is the order I want to go...this would be one minute...this would be two minutes...That's where I am at right now. I think it makes you have to synthesize what you've got and put it together. I really never thought about it...It helps to focus on quality rather than quantity; it helps to process information and have a sort of balance.

Interestingly, during the interview participants reflected on web video composition as being a more efficient medium for transferring knowledge, as compared to the process of traditional essay composition. They remarked on conveying the arguments in their video artefacts through different, multimodal "paragraphs" that supported their theses in the same coherent way that paragraphs would in a traditional essay. Some of them implied that they used "different language" other than text to deliver the message.

Similar to video-enhanced blogging, sharing web video through YouTube and embedding it into Blogger provided students with an opportunity to learn by seeing the videos of their peers and by being able to compare their own video narratives with those of others. In line with Vygotsky's (1978) concept of scaffolding and cooperative learning, web video sharing provided students with an opportunity to model learning behaviour because they were able to see what their peers have been doing, and to improve their own digital video artefacts according to their particular needs and professional aspirations.

5.4 Analysis of Learning Architecture of Web Video Project

A central theme in the design of the Web Video Project was the proposition of integrating web video into university curricula. The rationale behind the use of web video was two-fold. First, I argued that web video has the capacity to situate student learning within the broader contextual environment that embeds authentic (or real-life) experiences or situations. For instance, web videos exposed students to perspectives which were not considered "essential" knowledge, and would not normally be covered in peer-reviewed publications; at the same time, these videos provided background information that contributed to students' understanding of complex concepts and assisted them in connecting material from class readings and lectures to real-life. Second, I argued that video sharing websites serve as distributers of various artefacts of collective intelligence which had been created based on other individuals' conceptions of the world and their cultural experiences. By browsing the volumes of web video on video sharing websites, students were able to see and explore multiple and diverse perspectives on the same topic, thereby increasing their understanding of the subject matter, and expanding the breadth and depth of their knowledge. Following Vygotsky (1978), students who encounter naturally occurring problems over the course of study (e.g., difficulty understanding theoretical concepts) require additional information in order to move forward and face further risks as they emerge. Therefore, web video was positioned in this Project as a supplemental learning resource that helps students establish connections with other sources of knowledge coming from (a) scholarly publications and instructor's lectures, and (b) previous students' learning experience.

Within constructivist learning theories (Barab & Duffy, 2000; Brown et al., 1989; Herrington et al., 2003; Schwartz & Fisher, 2003), students are considered to be the constructors of knowledge. First, they extract relevant information from the sources provided. Second, they appropriate information by arranging its pieces into a coherent mental representation. Finally, they integrate the newly constructed representation with previous experience and embody their knowledge in both verbal and visual forms. Similarly, in the Web Video Project, the learning process was structured into four phases: (a) student-driven reflective learning; (b) collaboration; (c) application of knowledge; and (d) self-assessment.

Student-driven reflective learning was predicated on the coordination of three sources of knowledge: (a) scholarly (or authoritative) knowledge (e.g., peer reviewed articles, textbook chapters, and instructor's expertise); (b) "contextual" knowledge (e.g., authentic practices or others' perceptions and understandings represented in user created web videos); and (c) students' existing knowledge and prior experiences. At this stage, students were expected to make their own choice of relevant Web 2.0 videos in order to help them gain a better understanding of the assigned article (as a representation of decontextualized scholarly knowledge). In personal reflective conversations with each other, students were guided to establish connections between scholarly knowledge, contextual knowledge, and their prior knowledge, and to build new or modified constructs of their own knowledge (in the form of video-enhanced blogging).

Collaboration was carried out through active engagement in small group discussions and group presentations in the classroom. Furthermore, students were

required to read their peers' blogs and provide constructive feedback to their postings. Such engagement in collaborative knowledge construction enabled students to interact with each other both in the classroom and virtual environments, and to review alternative opinions on the readings since each student approached the articles from a different angle. This collaboration could in turn lead to the expansion of their knowledge and thinking skills, and to increased interaction among students and between students and course content.

Application of knowledge took the form of web video production either individually or in small groups. The development of the web video narrative was aimed at enabling students to present their understanding of the topic using multimodal, interactive, digital formats (e.g., images, animations, audio narrative, and video). When the digital video artefact was produced, students uploaded their videos to the Web so that they could share their knowledge with their peers and possibly an even larger audience.

Self- assessment was a critical component of the Web Video Project. When giving students an opportunity to undertake an intellectual risk while constructing their own knowledge, educational constructivists assert that students should play an active role in assessing their own performance by continuously reflecting on their experiences (Slavin, 2003). Therefore, self-assessment became an integral part of the learning process. The criteria for self-assessment in the form of a weighted rubric for a learning activity were co-developed with students before the Project began. Two separate rubrics – one for video-enhanced blogging and the other for web video production – were designed to enable students to carry out a holistic analysis of their learning performance, knowledge

construction, and thinking processes. As supported by research evidence, writing self-assessment reports helped students 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 use of two learning scenarios – the critical appropriation of existing web video and the creative production of students' own web video artefacts – was intended to connect four learning processes: active reading, critical reflection, collaboration, and application. The term "appropriation" retained the idea of borrowing or obtaining web video content for temporary use without manipulating the artefact (merely embedding it into a blog) and adopting the ideas from the video to support or reinforce students' own thinking. This study suggests that video-enhanced blogging holds potential to redefine student reflections in the Web environment. It further suggests that students perceive video-enhanced blogging as a viable learning activity that can facilitate authentic learning, critical reflection, and metacognitive growth. For instance, through appropriating existing web video and embedding it into blog postings, students were able to (a) participate in the discovery of relevant web video content (rather than being involved in a more passive engagement); (b) observe diverse and decentralized viewpoints on the subject matter studied; (c) develop new understandings of knowledge by establishing relationships between their prior knowledge and experience (scholarly or authoritative knowledge prescribed by the instructor through a syllabus) and the contextual knowledge inherent in user-created web videos; and (d) evaluate the reliability of the web video content and its relevance to the topic.

A major challenge for many students appeared to be the ability to connect knowledge previously acquired from the assigned articles with relevant, self-selected user-created web video in a critical reflection. Failure to locate relevant web video may have been influenced by technology incompatibility, constraints of video sharing websites, and the lack of web video searching skills. The ability to locate and retrieve relevant web video appeared to be affected by the level of video searching skills and the ways in which those skills were acquired in the first place. In other words, students should apply their knowledge and skills to practice in the context, otherwise they will not be able to transfer that knowledge and skills to a new situation or context. When confronting the tasks of appropriating existing web videos and producing one's own web video, students experienced problems related to the technical processes of web video use and production (e.g., embedding web video into a blog or editing their own video footage), and to the cognitive processes (e.g., making connections, drawing meaningful conclusions, getting their message across in a video format). In both tasks, students were required not just to complete the assignment on a technical level, but, more importantly, to demonstrate critical reasoning by providing connections to the readings and determining the relevancy of web video (appropriated or produced) to what was discussed in the readings.

This Project reinforces the value of instructors' facilitation and personalized support structures to ensure the success of web video mediated learning. The course instructor's role is not limited to delivering lectures and assigning reading materials, but also extends to arranging learning conditions and providing feedback and ongoing

support suited to the particular learning needs of students. This feedback includes practical support with new technology and Web 2.0 media, and was implemented during the Project in the form of Web 2.0 Boot Camp. Thus, a support framework should be developed before the implementation of web video mediated learning, taking into account the purpose of the support, the technical and conceptual dimensions of support (e.g., technical skills and multimodal composition skills), and the principles of support (e.g., ongoing, personalized, "on-the-fly," hands-on).

In conclusion, the proposed Web Video Project represents a beneficial learning approach that facilitates student learning through self-discovery, critical inquiry, appropriation, and creative production. The results of this study imply that web video mediated activities, with the help of self-assessment rubrics, allow students to undertake learning tasks, construct knowledge, and demonstrate understanding of various aspects of the topic involved. Since the Project was designed as student-driven learning, students were constantly faced with conceptual problems that they needed to solve rather than being provided with ready-made concepts to reproduce in classroom discussions.

5.5 Recommendations for Further Research

Given the limitations of the study outlined in the Introduction Chapter, it is recommended that further investigation be conducted to re-examine the impact of web video mediated learning and to modify the research methodology to explore comprehensively the effectiveness of the "Learning with Web Video" Model. One limitation of this study was the need for a larger sample size in order to test the hypotheses and support the conclusions with an increased number of participants. Further

research is needed to deal with the differences in the perceptions of participants engaging in video-enhanced blogging, as well as in web video production. These are issues for future investigation.

Since the study focussed on the exploration of students' perceptions about web video mediated learning, it is recommended to explore the social, interactive, dimensions of learning mediated with web video and to examine how students take advantage of such an opportunity through discussing their artefacts in blogging and video sharing environments.

Since the quantitative data collection was dominant in this mixed-method case study, it is recommended that a similar study be conducted where the qualitative analysis takes priority. Such an analysis would investigate the content of web video mediated activities – video-enhanced blogging and web video production – and allow for comparative analysis of the artefacts to see if they actually contain new knowledge, and to determine how web video influences the development of student thinking. Specifically, more investigation is needed to examine "different language" students use when composing video narratives and how the composition of multimodal "paragraphs" helps students convey their arguments.

Repetition of this study with an experimental design is recommended in order to compare whether students' perceptions and learning differ in other disciplines. In addition, most students in the study self-reported (via a posttest survey, and self-assessment reports) that their performance and understanding of the material improved. In the future, experimental tests ought to be conducted to determine whether the

integration of user-created web video improves students' factual knowledge and practical knowledge.

Since the amount of time devoted to this Project was found to be insufficient for some students to process their learning and deal with frustrations caused by using different technologies, it is recommended that the effectiveness of the proposed instructional methodology be evaluated in the context of a semester-long course that would provide students with adequate time to adapt to the new technologies.

Lastly, it has been argued that information absorbed with the aid of video does not necessarily enhance the retention of the materials (Saljo, 2009). It is therefore recommended that this study be repeated and students retested after several weeks have elapsed, in order to measure the long-term effects of video-enhanced blogging and web video production activities on learning. Some educators have posited that it is not the technology that influences the process of learning, but rather the re-visiting of the pedagogy in light of the application of technology (Clark, 1994). It is recommended that the effectiveness of the Model in online and traditional learning modalities be investigated, so that it might be determined whether students' perceptions of learning benefits and acquisition of content knowledge differ depending on the instructional paradigm.

Apart from the methodological recommendations, further research needs to investigate emergent experiences involving the use of video analytics and browser-based video editors which are becoming inherent to a new wave of Web development, often suggested in the literature as Web 3.0 or the semantic Web (Berners-Lee, Hendler, &

Lassila, 2001). While the definition of Web 3.0 is problematic, some technologists describe it as the convergence of semantic Web, rich multimedia attributes, and 3D environments into Web-based ecosystems that enable users to bring closer the real world and virtual means of communication, as well as to improve access to information by linking data derived from multiple Web sites and by retrieving relevant information using intelligent agents (Fuchs, Hofkirchner, Schafranek, Raffl, Sandoval, & Bichler, 2010; Karakas & Manisaligil, 2012; Miranda, Gualtieri, & Coccia, 2010). As such, video analytics enable users to retrieve and analyze video content and search for trends in an automated process. By moving into the direction of Web 3.0, software developers are pushing video editing forward by enabling users to create and edit new video content "on the fly" (directly on the Web), without importing a video project into a desktop video editing software. In higher education environments, these and other improvements afforded by Web 3.0 are important to be investigated as they provide learners with new ways to search and organize video content on the Web, as well as to give students additional mechanisms of control over how the video content should be produced, shared, accessed, and viewed. Furthermore, should these new developments in semantically supported web video production and sharing become part of university curriculum, student collaboration and knowledge sharing over the Web may be transformed in a conceptually distinctive and creative way.

5.6 Conclusions

This study's simultaneous examination of two web video mediated learning scenarios (the critical appropriation of existing web video and the creative production of

one's own web video) provide important insights about the role that user-created web video can play in facilitating student learning in a university classroom. First, the findings help to expand our understanding of web video as a culturally new form of knowledge representation. The study likewise permits a reconsideration of web video's affordances and constraints for traditional university instruction, which currently appears to be threatened with an avalanche of amateur content perceived as antithetical to the scholarly knowledge represented by peer-reviewed articles and textbooks. Use of web video in the university classroom not only helps to promote diversity of information and critical awareness of multiple perspectives, but also teaches students to understand the nature of user-created content, and open standards of production and sharing. It also teaches them to recognize the ownership of web video artefacts in the same way that they recognize the ownership of scholarly knowledge presented in peer-reviewed publications or instructors' lectures. The study has demonstrated that video sharing websites may offer students a broader sampling of video content with detailed and specific real-world examples. Although this mode of learning can be perceived as a threat to the traditional authority of teaching and knowledge production, this study offers a strategy for properly balancing the appropriation of existing user-created web videos with scholarly knowledge so that students are able to advance their understanding of the subject matter and to further the breadth and depth of their knowledge in the discipline.

Second, evidence can be broadly interpreted as suggesting that the learning architecture of the Web Video Project was critical to student's success and high satisfaction with the Project, which created conditions for them to become active

participants who are accountable for their learning. This development speaks to students' eagerness to move away from the traditional instructor-focussed teaching model to a new student-driven approach that gives them a certain degree of flexibility in customizing their learning (e.g., through constructing knowledge by extracting information from different sources) and enables them to take accountability for their own progress in the course. In order to improve the effectiveness of student-driven learning inherent in the Project, this study reinforces the need to provide students with the explicit guidelines for the learning experience. It also suggests the need to build pedagogical practices that offer continuous structured support and technology expertise, and to supply students with appropriate course materials suitable to their learning preferences. By having clear guidelines in place, the instructors can help to direct students' efforts towards achieving expected course outcomes and focus them on the critical reasoning and metacognitive skills that are so necessary in the age of open sharing of knowledge. Additionally, instructors' acceptance of the pedagogy involved in web video mediated learning and understanding of the affordance of web video for student learning is of vital importance. This study was only possible because course instructors were highly supportive of the Project and maintained their commitment to improving the quality of the student learning experience with web video throughout its duration.

In conclusion, findings from this dissertation are presented as a first step towards understanding the impact that user-created web video has on students' learning when mobilized as an integral part of university curricula. Data analysis confirmed that students felt comfortable and gained knowledge of and skills in applying web video for

their learning. Furthermore, students appeared to be enthusiastic about fitting web video into their learning strategies, and were capable of diagnosing the affordances as well as the constraints of integrating web video into their learning while experiencing it firsthand. Although a number of concerns were voiced about the accuracy and reliability of web video content and its appropriation for learning, it is possible to conclude that students eventually may have found benefits of learning with web video, benefits attributable to its distinct properties such as immediate accessibility, customized searchability, multimodal functionality, diversity of perspectives, and instant gratification among others. Similarly, students have justifiably criticized the Project for its intensive learning activities, mediated with different new technologies, and its delivery in a fast-paced learning environment. Despite the challenges and barriers, the opportunities for web video integration are also very clear. In particular, this investigation has provided evidence that web video is largely supported by students and perceived as a catalyst for facilitating learning by enabling students to engage in authentic activities, explore alternative aspects of the subject matter, and exercise critical evaluation of different knowledge sources and multiple opinions.

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APPENDICES

Appendix A: York's Human Participants Review Sub-Committee Approval

YORK
UNIVERSITÉ
UNIVERSITY

Certificate #:	**STU 2010 - 005**
Approval Period:	**01/19/10-01/19/11**

OFFICE OF RESEARCH ETHICS (ORE)
5th Floor, York Research Tower

4700 Keele St.
Toronto ON
Canada M3J 1P3
Tel 416 736 5914
Fax 416 736 5837
www.research.yorku.ca

Memo

To: Mr. Denys Lupshenyuk, Faculty of Education, denysl@yorku.ca

From: Alison M. Collins-Mrakas, Sr. Manager and Policy Advisor, Research Ethics
(on behalf of Daphne Winland, Chair, Human Participants Review Committee)

Date: **Tuesday 19th January, 2010**

Re: Ethics Approval

Learning with Web 2.0 video in higher education

I am writing to inform you that the Human Participants Review Sub-Committee has reviewed and approved the above project.

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: acollins@yorku.ca.

Yours sincerely,

Alison M. Collins-Mrakas M.Sc., LLM
Sr. Manager and Policy Advisor,
Office of Research Ethics

Appendix B: UWA's Research Oversight Committee Approval

THE UNIVERSITY OF WEST ALABAMA
LIVINGSTON

December 15, 2009

Dear Mr. Lupshenyuk:

The Research Oversight Committee for the Protection of Human Subjects at the University of West Alabama has approved you to conduct your reach titled "Learning with Web 2.0 Video In Higher Education." The committee determined that there is minimal risk with your research.

I wish you well with your research endeavor. If you have questions or concerns, please do not hesitate to contact me.

Sincerely,

Rodney Granec

Office of Sponsored Programs
126 Bibb Graves Hall • Station 9 • Livingston, Alabama 35470 • (205) 652-3424 • (205) 242-5061 • bharvard@uwa.edu

Appendix C: Informed Consent Forms for Students and Faculty

Informed Consent Form for Students

Date: November 18, 2009

Study Name: Learning with Web 2.0 video in higher education

Researcher: Denys Lupshenyuk, PhD Candidate, Graduate Program in Education, Faculty of Graduate Studies, York University

Supervisor: Ron Owston, PhD, University Professor, Faculty of Education, York University

Purpose of the Research: To explore the influences of Web 2.0 video on the learning process and the variation in students' conceptions of Web 2.0 video-mediated learning.

What You Will Be Asked to Do in the Research: You will be asked to: (a) participate in questionnaires periodically throughout the study; (b) answer interview questions about your concerns related to Web 2.0 video and the nature of your personal learning experience; (c) submit work that will be reviewed as part of the research project; (d) communicate thoughts and ideas in a classroom discussions that will be monitored by the researcher.

Risks and Discomforts: I do not foresee any risks or discomfort from your participation in the research.

Benefits of the Research and Benefits to You: Improvements to our understanding about the influences of Web 2.0 video on learning and knowledge-building will be gained through your involvement and participation in this research project. The implications will help instructors in the future make instructional decisions on how to design learning environments replete with the use of Web 2.0 video. Participants will learn to use Web 2.0 video to support their learning.

Voluntary Participation: Your voluntary participation in the study will involve completing five web-based questionnaires using a secured survey system hosted by York University. Each questionnaire will take 15-20 minutes of your time. In addition, you may choose to voluntarily participate and share your personal experiences in a series of three interviews which will last for 40 minutes each over a period of two weeks. The interview will be conducted in a face-to-face setting at mutual agreeable time to both the interviewee and the researcher. The interviews will be digitally recorded by the researcher using a digital audio recorder and later transcribed for the purpose of interpretation of collected data. While participating in interviewing, you will be asked questions pertaining to your attitudes, concerns, perceptions, reactions, conceptions related to your learning with the use of Web 2.0 video. Your decision not to participate in research activities will not influence your relationship with the researcher, the instructor, the University of West Alabama, York University, or any other group associated with this project either now, or in the future.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to refuse to participate, or to refuse to answer any questions, or to withdraw from the study will not affect your course grades in any way and will

not affect your relationship with the researchers, the instructor, the University of West Alabama, York University, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

Confidentiality: All information you supply during the research will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. Each participant will be assigned a unique identification code number at the time of questionnaire and/or interview administration. The names of respondents and interviewees will be kept strictly confidential and will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. Your data will be safely stored on a password protected computer in my home office and only the researcher will have access to the computer. All collected data will be kept for three years and then securely deleted from my computer. Digital audio recordings will be transcribed immediately after the interviews into my computer and then permanently deleted from the digital audio recorder. Confidentiality will be provided to the fullest extent possible by law. The data will be used for my doctoral dissertation and the results of this study will be disseminated through published articles or conference presentations.

Questions About the Research? If you have questions about the research in general or about your role in the study, please feel free to contact Denys Lupshenyuk, Ph.D. Candidate, Graduate Program in Education, by e-mail denys_lupshenyuk@edu.yorku.ca or my supervisor Dr. Ron Owston, University Professor, Faculty of Education, York University, by telephone 416-736-5019 or by e-mail rowston@edu.yorku.ca. This research has been reviewed and approved by the Human Participants Review Subcommittee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Office of Graduate Program in Education, 282 Winters College, York University (telephone 416-736-5018 or e-mail gradprogram@edu.yorku.ca) or Alison Collins-Mrakas, the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures:

I *(print your name)* _____, consent to participate in *Learning with Web 2.0 Video in Higher Education Research Study* conducted by Denys Lupshenyuk, a Ph.D. Candidate at the Faculty of Graduate Studies of York University. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Signature _____ **Date** _____
Participant

Signature _____ **Date** _____
Principal Investigator

Informed Consent Form for Instructors

Date: November 18, 2009

Study Name: Learning with Web 2.0 video in higher education

Researcher: Denys Lupshenyuk, PhD Candidate, Graduate Program in Education, Faculty of Graduate Studies, York University

Supervisor: Ron Owston, PhD, University Professor, Faculty of Education, York University

Purpose of the Research: To explore the influences of Web 2.0 video on the learning process and the variation in students' conceptions of Web 2.0 video-mediated learning. To help me understand more accurately what challenges and opportunities students experience when they bring Web 2.0 video to the classroom discourse, I would like to conduct classroom observation as a part of the research project. By observing how students interact and engage in collaborative learning activities in the classroom, I will be able to explore the interrelationships between the students and the Web 2.0 video in a collaborative setting.

What You Will Be Asked to Do in the Research: I request your permission to conduct classroom observation while you are teaching an instructional technology course. With your permission, I will attend four class sessions as an observer during the research study period. I will not interrupt students' interactions and will take no part in teaching and evaluation activities. The focus of my observation will be how students act and communicate in classroom discussion activities and how they incorporate Web 2.0 video into their discourse.

Risks and Discomforts: I do not foresee any risks or discomfort from students' participation in the research.

Benefits of the Research and Benefits to You: With your permission to conduct classroom observation, improvements to our understanding about the influences of Web 2.0 video on learning and knowledge-building will be gained. The implications will help instructors in the future make instructional decisions on how to design learning environments replete with the use of Web 2.0 video. Participants will learn to use Web 2.0 video to support their learning.

Voluntary Participation: Participation in this study is voluntary. Your decision whether or not to allow the researcher to observe the classroom will not influence your relationship with the researcher, the University of West Alabama, York University, or any other group associated with this project either now, or in the future.

Withdrawal from the Study: Your decision to withdraw your permission for classroom observation at any time, for any reason, if you so decide, will not affect your relationship with the researcher, the University of West Alabama, York University, or any other group associated with this project. In the event you withdraw your permission, all associated data collected during classroom observation will be immediately destroyed wherever possible.

Confidentiality: All information collected during classroom observation will be kept strictly confidential. Students' name will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. The collected data will be safely stored on a password protected computer in my home office and only the researcher will have access to the computer. All collected data will be kept for a period of 3 years following the completion of this study and then securely deleted from my computer. Confidentiality will be provided to the fullest extent possible by law. The data will be used for my doctoral dissertation and the results of this study will be disseminated through published articles or conference presentations.

Questions About the Research? If you have questions about the research in general or about your role in the study, please feel free to contact Denys Lupshenyuk, Ph.D. Candidate, Graduate Program in Education, by e-mail denys_lupshenyuk@edu.yorku.ca or my supervisor Dr. Ron Owston, University Professor, Faculty of Education, York University, by telephone 416-736-5019 or by e-mail rowston@edu.yorku.ca. This research has been reviewed and approved by the Human Participants Review Subcommittee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Office of Graduate Program in Education, 282 Winters College, York University (telephone 416-736-5018 or e-mail gradprogram@edu.yorku.ca) or Alison Collins-Mrakas, the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures:

I *(print your name)* _____, consent to participate in *Learning with Web 2.0 Video in Higher Education Research Study* conducted by Denys Lupshenyuk, a Ph.D. Candidate at the Faculty of Graduate Studies of York University. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Signature _____ **Date** _____
Participant

Signature _____ **Date** _____
Principal Investigator

Appendix D: Timeframe for Data Collection during Fieldwork

Week	Quantitative Data Collection	Qualitative Data Collection
Week One	• Introduce students to the study and encourage them to participate • Ask students to sign an informed consent form • Administer a series of pretest web-based surveys: o Background survey (pretest only) o Concerns and Levels of Use survey o Web Video Affordances and Constraints survey	• Send out a research interview invitation letter to the interested participants
Week Two		• Conduct a first round of interviews with the participants on an individual basis in a face-to-face format (using a digital tape recorder) • Collect students' personal statements about the use of web video in their learning and teaching
Week Three	No data collection procedures	
Week Four	• Ask students to provide brief midpoint feedback on their progress during the Web Video Project using a web-based survey tool that included five open-ended questions.	
		• Conduct a second round of interviews with the participants on an individual basis in a face-to-face format (using a digital tape recorder)
Week Five		• Collect students self-assessment reports on their video enhanced blogging assignment
Week Six	• Administer a series of posttest web-based surveys: • Concerns and Levels of Use survey • Web Video Affordances and Constraints survey • Web Video Impact survey (posttest only)	• Conduct a third round of interviews with the participants on an individual basis in a face-to-face format (using a digital tape recorder) • Collect students' re-visited personal statements about the use of web video in their learning and teaching • Collect students self-assessment reports on their web video composition assignment • Conduct an interview with two course instructors concurrently in a face-to-face format.

Appendix E: Research Interview Invitation Letter

Dear Participant,

Thank you for showing interest in participating in a three-series interviewing. It is crucial for this research study to examine: (a) what you, as a student, think about your use of Web 2.0 technologies for your learning, (b) how you understand the value of user-created web video for your learning, and (c) why you find using web video either beneficial or discouraging. You are asked to participate in three interviews. Each interview will last 35-40 minutes and will be conducted in a face-to-face setting at mutual agreeable time.

CONFIDENTIALITY OF THE PROCEDURE. All three interviews will be digitally recorded using a digital audio recorder and later transcribed for the purpose of interpretation of collected data. Your names will be kept strictly confidential and will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. Digital audio recordings will be transcribed immediately after the interviews into my computer and then permanently deleted from the digital audio recorder. Confidentiality will be provided to the fullest extent possible by law. The data will be used for my doctoral dissertation and the results of this study will be disseminated in aggregate form through published articles or conference presentations.

While participating in interviewing, you will be asked questions pertaining to your attitudes, concerns, perceptions, reactions, conceptions related to your learning with the use of user-created web video:

- **First interview** (Feb. 01 to Feb. 05). I will ask you about your prior experiences with web video before your engagement with the Web Video Project infused into your ED505 class.
- **Second interview** (Feb. 15 to Feb. 19). I will focus my questions on the details of your current experiences with web video while participating in the Project learning activities.
- **Third interview** (Mar. 01 to 05). I will ask you to reflect on the meaning of your experience with web video and what you have learned from that experience.

Below you will find a schedule for the First Interview. If you can participate in <u>all three interviews</u> with me, please sign-up for the first interview. Select the time slot, convenient for you, in the table below and email it to me back by Tuesday morning (Feb. 02) the latest. Then, I will send you a confirmation with the room number where the interview will take place.

Attached please find the interview information sheet. Your response will be much appreciated and I look forward to hearing from you.

Best regards,

Denys Lupshenyuk, Ph.D. Candidate
Principal Investigator
dlupshenyuk@uwa.edu

FIRST INTERVEW SCHEDULE

Pick a time slot which is convenient to you.

Time	Feb. 01 (Mon)	Feb. 02 (Tue)	Feb. 03 (Wed)	Feb. 04 (Thurs)
10:00 – 11:00				
11:00 – 12:00				
1:00 – 2:00				
2:00 – 3:00				
3:00 – 4:00				

Appendix F: Web Video Project Guidelines

Contents

Project Synopsis

The Web Video Project considers the questions of knowledge, Web 2.0 technologies, and educational praxis in relation to learning and teaching and technology integration into the instructional process. It provides an on-going opportunity to inquire into the areas of user-created web video and its pedagogy, as well as into theories, discourses and practical application approaches in the field of technology and education (e.g., assistive technology, online ethics, ePortfolios, and evaluation of Web 2.0 resources).

Through critical engagement with the readings of scholarly articles, Web 2.0 technologies, class assignments, and with each other, students will articulate and refine their understandings of web video as an emergent medium for learning as they begin to identify and develop their own perspectives on educational technology and the application of Web 2.0 technologies in their own learning and teaching. These intellectual explorations will provide a knowledge base and hands-on experience appropriate to the needs and aspirations of a 21st-century teacher.

This project is intended to stimulate examination of user-created web video and its combination with academic knowledge and develop a community of learners dedicated to academic excellence in a climate of collaborative critical inquiry, creativity, and tolerant, constructive peer review. It invites the multiple diverse viewpoints and voices of all ED 505 learning participants.

Project Evaluation Rubric (30% of your final course grade)

Assignment Name	Assignment Description	Points
Statement of personal philosophy about the role of web video in learning and teaching (Part 1)	Write a statement of your current theory of learning with web video and how this connects in your mind with what you see as good learning and teaching (300-500 words).	10pts.
Video enhanced blogging (reflection)	Compose at least four video blogging entries (summary, embedded video, reflections, and thought-provoking questions) and post at least 4 constructive peer commentaries.	30pts.
Participation in small-group discussions in class	Contribute to classroom discussions of assigned articles at least two times.	10pts.
Production of web video	Design, create, and publish on the Web a digital video project on assistive technology (5-10 min in length). The video composition should incorporate purposefully the following elements: authentic video footage, borrowed video segment, animation, text, audio, and still image.	40pts.
Revision of the statement of personal philosophy (Part 2)	Re-visit your initial statement of personal philosophy to what you have learned since the Project has started (300-500 words).	10pts.
Total		100pts.

Detailed Overview of Assignments

Assignment 1: Statement / Re-statement of personal philosophy about the role of web video in learning and teaching[1] (20pts.)

Part 1 (Due Feb. 10/11, 10pts.): Write a statement of what you think currently of Web 2.0 technologies, particularly blog and YouTube (or also referred to as user-created web video) for yourself as a learner and how it connects in your mind with what you see as good teaching. At the end of the Web Video Project, please revisit your views.

You should address ALL of the following questions in this assignment:

- *What do you currently understand learning with web video to be – for yourself as a learner and for your students if you teach?*
- *What role does web video play in your learning?* You may recall a recent instance in which you found a relevant web video to your learning, web video that helped you understand an issue you were struggling with or web video that led to an action or decision. As well, you may describe that incident in enough detail so that the reader can visualize the situation.
- *Why (on what basis) do you hold those views, both for yourself and for your students?* If you are not a teacher think of a situation where you have taught somebody something.

[1] This approach is a revision of a course assignment which the researcher came across when taking the *CTL 1608 Constructive Learning & Design of Online Environments* graduate course at the Ontario Institute for Studies in Education of the University of Toronto in 2008-09 academic year.

- *What role does knowledge play in learning?* Do you agree or disagree with the following statement: "A combination of academic knowledge (e.g., scholarly journals) and Web 2.0 content (i.e., user-generated content, such as YouTube or Wikipedia) will become the norm for school-based education."
- *What role do others play in your learning (e.g. peers, teachers etc)?*

Part 2 (Due Mar. 03/04, 10 pts.): You will re-vise your initial statement of personal philosophy towards the end of the project, using the same questions.

Assignment 2: Video enhanced blogging (30 pts.)

This assignment will be self-assessed. You are expected to read deeply and engage critically with the scholarly articles individually, find a relevant web video (i.e., user-created web video, such as YouTube), and share your thinking with the rest of the class via your blog.

Your interpretations of the readings and borrowed web videos are central to the Project; most important are the changes in understanding that are revealed as you re-read your blog entries and re-consider your initial responses to what you have read and watched. In the course of the Project, the preposition "re" takes on strong significance, as in re-search (to seek again), re-cognize (to know again), re-view (to view again), re-read, etc. This process is very useful for deepening responses to readings.

To these end, you will be asked to keep a video enhanced blog where you will summarize the main points of the articles, reflect on several points that strike you as significant, and identify one persisting question that remains with you. In addition to the readings, you will be asked to find and embed a relevant web video into your blogs to support the readings and your own reflections.

NOTE: You are not permitted to use in any way commercial video with copyright restrictions for blogging or any other learning activities in this Project.

In keeping with the collaborative nature of learning, you will be asked to establish "learning community" connections with other fellow students by commenting on their blog entries in a constructive and supportive way. Additionally, you may supplement your text-based commentaries with a relevant web video embedded into your commentary postings.

Video enhanced blog structure. For each assigned reading, prepare a video enhanced blog entry of the following[2]:

1. *Summary of the article* (no more than 100 words). This part should give a person who has never read the article a sense of what it includes. Try to be as "objective" as possible at this stage. Be succinct and precise.
2. *Borrowed web video* (at least one video per entry). Search for a relevant web video to support the readings and your reflective thinking and embed it into your blog entry.
3. *Your personal reflection* (150-200 words). Choose and record four or five salient points from the article that strike you as significant. These should not be a summary. Also, prepare a three or four sentence reflection on how the web video you have selected for your blog relates to the content of the article, to your experience, other readings, and expectations.
   Helpful hints (Kanevsky, 1994, Triple Entry Notebook Guidelines):
   - Begin by reflecting on the major points made in the reading that you have included in your summary and the web video you have selected and viewed. Your statement should reflect thoughtful views on the implications of what the author of the article is saying.
   - Do you agree or disagree with the author of the article or the author of the web video? Why?
   - What impressed you / annoyed you about the reading / viewing the web video?
   - How does this fit in with your beliefs, philosophy, or prior knowledge off the subject?

[2] This approach is a revision of a critical reflection journal assignment which the researcher came across when taking the *EDUC 5100 Research and Issues in Language, Culture and Teaching: Doctoral Seminar* at York University in 2007-08 academic year.

- Where have your ideas changed / been confirmed? The reflections should be deeper than "I like this idea?" or "I've never met a person who could live up to this."

4. *A thought-provoking question* (at least one question per entry). When you think you are done, write one persisting question that remains with you after the steps above. Give a reason why this question continues to be significant.

Self-assessment rubric for evaluation of video enhanced blogging. Please consider this rubric during these four weeks, and consider how it might be modified to better reflect the video weblogging experience.

80-100	70-80	60-70	0-50
• Weekly entries contain all four elements: a summary of the article, web video, personal reflection, and a thought-provoking question. • All entries are concise and precise and consistently show connections to the readings, borrowed web video, and personal experience. • All entries reflect your own attempt to grapple with ideas encountered while reading your peers' posts, in relation to your own development and identity as a graduate student. • One constructive commentary was made to your peers' blogs each week.	• Weekly entries contain all four elements: a summary of the article, web video, personal reflection, and a thought-provoking question. • All entries are concise and precise and mainly show links to the readings and/or borrowed web video. • Most entries reflect your own attempt to grapple with ideas encountered while reading other students' posts, in relation to your own development and identity as a graduate student. • One commentary was made to other students' blogs each week.	• Weekly entries contain all four elements: a summary of the article, web video, personal reflection, and a thought-provoking question. • Entries mainly characterized by summary and limited connections to other sources of knowledge – the article, web video and personal experience. • Commentaries were not regularly made to other students' blogs.	• Weekly entries do not contain all four elements. • Entries were infrequent and characterized primarily by summary with limited connections to other sources of knowledge. • There was one commentary made.

Note: To calculate points for the video enhanced blogging assignment – use rubric to evaluate your weekly contributions (3 weekly contributions in total): 3 x student's mark /10; e.g., 3x95/10=28.5 pts.

Assignment 3: Participation in small-group discussions (10pts.)

You will form small groups for discussing and exploring in the classroom the issues represented in the assigned articles, relevant web videos, and your prior knowledge and personal experience. You will have 15-20 minutes for your preparation and in-group discussion. Each small group is responsible for presenting one answer to one of the thought-provoking questions posted on your blogs. Then, the rest of the class will ask and probe challenging questions. You should come to class prepared to participate in these discussions. The classroom discussion activity will be facilitated by the course instructor.

Assignment 4: Production of web video (40pts.)

You will be asked to create and publish on the Web your own digital video representing your understanding of the assistive technology topic. The web video composition will integrate multiple modes of representations (authentic video footage, borrowed video segment, animation, audio, still images, PowerPoint slides, and text) to share your knowledge and thinking. The web video composition process will include the following stages:

a) Selecting a topic;
b) Scripting the design;
c) Collecting own video footage and/or remixing/reusing other videos;
d) Editing the video footage using MS MovieMaker, video-editing software;
e) Publishing the digital video composition either to YouTube or TeacherTube websites.

Self-assessment rubric for evaluation of web video composition. Please consider this rubric when evaluating your own web video production experience.

CATEGORY	4	3	2	1
Purpose of web video composition	Establishes a purpose early on and maintains a clear focus throughout.	Establishes a purpose early on and maintains focus for most of the video.	There are a few lapses in focus, but the purpose is fairly clear.	It is difficult to figure out the purpose of the video.
Originality	Your video shows considerable originality and inventiveness. The content and ideas are presented in a unique and interesting way.	Your video shows some originality and inventiveness. The content and ideas are presented in an interesting way.	Your video shows an attempt at originality and inventiveness.	Your video is a rehash of other people's ideas and/or graphics and shows very little attempt at original thought.
Overall content	Strong message. Covers topic in-depth with details and examples. All content throughout the video is accurate. There are no factual errors.	Message is clearly communicated. Includes essential information. Most of the content is accurate but there is one piece of information that might be inaccurate.	Message is vaguely communicated. Includes some essential information with few facts. The content is generally accurate, but one piece of information is clearly flawed or inaccurate.	Message is unclear. Includes little essential information and one or two facts. Content is typically confusing or contains more than one factual error.
Digital enhancements or effects (visual effects, transitions)	Digital enhancements are planned and purposeful, adding impact to the story line or focus. Video moves smoothly from shot to shot. A variety of transitions is used to assist in communicating the main idea and smooth the flow from one scene to the next. Shots and scenes flow seamlessly. Digital effects are used appropriately for emphasis.	Any digital enhancements that are used combine smoothly and effectively with the video. A variety of transitions are used. Good pacing and timing.	Digital enhancements accompany video, but there is little sign of reinforcement. Some tendency toward randomness with effects. Transitions from shot to shot are choppy, and the types of wipes and fades selected are not always appropriate for the scene. There are many unnatural breaks.	Little or no enhancements add interest to the video, or excessive use of random enhancements detracts from the video. No transitions between clips are used. Raw clips run back to back in the final video.

Audio editing	The audio is clear and effectively assists in communicating the main idea. Background audio is kept in balance.	The audio is clear and assists in communicating the main idea.	The audio is inconsistent in clarity (too loud/too soft/garbled) at times and/or the background audio overpowers the primary audio.	The audio is cut-off and inconsistent or overpowering.
Titles and credits	All titles and credits are accurate, legible and draw the viewer's attention.	Most titles and credits are accurate, legible and draw the viewer's attention.	Some titles and credits are accurate, legible and draw the viewer's attention.	Few (less than 75%) titles and credits are accurate, legible and draw the viewer's attention.
Duration of video composition	Length of video was 5-7 minutes.	Length of video was 4-5 minutes.	Length of video was 3-4 minutes.	Video was less than 3 minutes or more than 10 minutes long.
Required elements	All four media sources of information (own video footage, existing video fragments, still image, and audio) are logically incorporated in the video podcast.	Most media sources of information are incorporated in the video podcast.	At least two media sources of information are incorporated in the video podcast.	Only one media source of information is incorporated in the video podcast.
Mechanics	Grammar and usage were correct and contributed to clarity and video style.	Grammar and usage were typically correct and errors did not detract from the video narrative.	Grammar and usage were typically correct but errors detracted from the video narrative.	Repeated errors in grammar and usage distracted greatly from the video narrative.
Copyright	Citations give proper credit. Every video, photo, graphic or sound file is either original or permission for its use by the owner is documented.	Citations are given, sources of multimedia are identified, but permission to reproduce is missing.	Citations are given, but some multimedia sources are not identified with references, and permission to reproduce is missing.	There are no citations or are no references to copyright information for photos, graphics, and music created by others.
Scale:	40-36 = Exemplary	35-26 = Proficient	25-15 = Developing	14 and less = Incomplete

Appendix G: Calendar for the Web 2.0 Boot Camp Training Sessions

Project Week	Topics on the Boot Camp agenda	Technology utilized during Boot Camp sessions	Skills learned during Boot Camp sessions
Week 1 User-created web video and its convergence with blogging	• User-created web video, its classification • Video sharing communities, its classification • YouTube, its layout and functionalities • How to search for web video using Google Video and YouTube • How to evaluate web video clips • Blogs and video enhanced blogging	• All-purpose video sharing communities (YouTube, DailyMotion, MetaCafe, Viddler) • Educational video sharing communities (YouTubeEdu, TeacherTube, EduTube) • Intellectual video sharing networks (TED, ForaTV, BigThink) • Blogger, a popular blog platform	• Creating a personal YouTube channel • Web video searching skills • Web video evaluation skills • Setting up a Blogger account • Embedding web video into blogs
Week 2 Pre-production: Plan your digital video composition	• Developing the idea for students' digital video artefacts • Styles of digital video compositions	• MS Office (Word) • YouTube	• Developing a digital video proposal • Writing script and storyboard for a particular style of video • Scheduling/establishing timelines for digital video project
Week 3 Digital video production: Gathering resources & filming	• Presentation of students' own plans for web video projects • Gathering materials • Training in the use of video capturing technologies, e.g., desktop video capture, cell phones, webcams etc.	• Memory sticks • Paint, an image editing software • MS Research AutoCollage • Xtranormal, an animation making tool • Voki, a digital avatar making tool • Audacity, audio editing software • Screencasting technologies (Jing, Webinaria) • FlipCamera, cell phones with built-in camcorders • Video conversion tools (Vixy.net, Zamzar.com, FLV Converter, Free Video Converter v. 2.5)	• Media searching skills • Media storage and management skills • Video shooting techniques • Importing raw video files to a computer • Creating video animations and personalized speaking avatars • Image editing skills

Week 4 Digital video editing with Windows MovieMaker	• Training in the use of Windows MovieMaker • Development of a draft storyboard with all resources collected • Work with projects and clips in MovieMaker	• Windows MovieMaker • Video conversion tools	• Navigating MovieMaker Interface • Creating a project in MovieMaker • Downloading raw video from camera to the computer • Importing digital media files (e.g., video clips, images, and/or animation) from a memory stick to the project • Basic digital video editing skills (splitting a clip, combining clips, trimming a clip, creating clips)
Week 5 Digital video polishing	• Audio or music import • Narration • Titles and credits • Transitions and special effects	• Windows MovieMaker	• Advanced digital video editing skills (adding audio tracks, sound clips, and narration; adding titles and credits; adding transitions and special effects)
Week 6 Publishing digital video to the Web	Showcase of students' own web videos	• YouTube	

Appendix H: Students' Background Survey

All survey data will be kept confidential and is only reported in aggregate form for research purpose only. The collected data will not be used to evaluate you or your instructor. Time needed to complete the questionnaire - 5 to 10 minutes.

THANK YOU FOR TAKING TIME TO COMPLETE THIS TASK.

For continuity in processing this data, please enter your student identification number.

SECTION 1: YOUR PERSONAL PROFILE

1. Gender

- Female
- Male

2. To which generation group do you belong?

- Baby Boom Generation (over 45 years old)
- Generation X (30 to 45 years old)
- Generation Y (under 30 years old)

3. Please indicate below how many years of higher education (undergraduate and graduate) you have completed:

4. Please indicate below how many years of teaching experience, including this school year, you have.

5. What academic fields are you majoring in? Check all that apply.

- Elementary Education
- School Counseling / Psychology
- Language Arts
- Physical Education
- Mathematics / Science
- Special Education
- Other

If other, please specify below.

6. Have you previously taken any instructional technology courses?

- No
- Yes

7. Have you previously taken any courses online?

- ● No
- ● Yes

8. Have you previously taken a course that used Web video (such as YouTube and the like)?

- ● No
- ● Yes

SECTION 2: YOUR EXPERIENCE WITH TECHNOLOGY IN UNIVERSITY CLASSROOM

9. How often does your instructor use the following technologies as part of course instruction? Using the scale provided, please rate each of the following.

	Never	Some classes	Most classes	Every class
Cameras / Camcorders	●	●	●	●
Mobile devices (e.g., PDAs, iPhone, iPod)	●	●	●	●
Blog	●	●	●	●
Wiki	●	●	●	●
YouTube, TeacherTube or other Web video sharing websites	●	●	●	●
Social networking (e.g., Facebook, MySpace)	●	●	●	●
Social bookmarking (e.g., Delicious)	●	●	●	●

10. Please rate your PREFERENCES for each of the following activities in which you have participated as part of your previous study at university. Use a scale of 1 to 5, where 1 is least preferred and 5 is most preferred.

	N/A	1	2	3	4	5
Blogging	●	●	●	●	●	●
Watching user-created Web video	●	●	●	●	●	●
Listening to an audio podcast	●	●	●	●	●	●
Embedding Web video into blog (i.e., video enhanced blog)	●	●	●	●	●	●
Commenting on other people's blogs	●	●	●	●	●	●
Creating an audio podcast	●	●	●	●	●	●
Producing a web video	●	●	●	●	●	●

SECTION 3: YOUR ASSESSMENT OF INTERNET AND WEB 2.0 TECHNOLOGY SKILLS

11. How many hours per WEEK do you spend using the Internet?

- None
- 1 to 5 hours
- 5 to 10 hours
- 10 to 15 hours
- 15 to 20 hours
- More than 20 hours

12. How would you rate your Internet and Web 2.0 skills? Using the scale provided, please rate each of the following skills:

	None	Extremely Poor	Below Average	Average	Above Average	Excellent
Search the Web for information using search engines (e.g., Google, Yahoo, Bing, etc.)	●	●	●	●	●	●
Locate necessary information on the Web	●	●	●	●	●	●
Create and contribute to a blog	●	●	●	●	●	●
Create and contribute to a wiki	●	●	●	●	●	●
Search images over the Web using search engines (e.g., Google, Yahoo, Bing)	●	●	●	●	●	●
Search videos over the Web using search engines (e.g., Google, Yahoo, Bing)	●	●	●	●	●	●
Search videos using video sharing websites (e.g., YouTube, TeacherTube, BlipTV, etc.)	●	●	●	●	●	●
Embed Web video (such as YouTube video) into a blog	●	●	●	●	●	●
Produce a web video	●	●	●	●	●	●
Upload an audio podcast / digital video to the Web	●	●	●	●	●	●
Use drawing or paint programs (e.g., Paint, Photoshop, and the like)	●	●	●	●	●	●

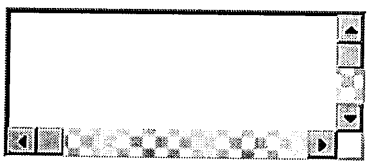
SECTION 4: YOUR PERSONAL USE OF WEB VIDEO

13. Which Web 2.0 video sharing networks / communities have you used before?

	No	Yes
YouTube	●	●
BlipTV	●	●
DailyMotion	●	●
MetaCafe	●	●
Veoh	●	●

TeacherTube	●	●
EduTube	●	●
Viddler	●	●

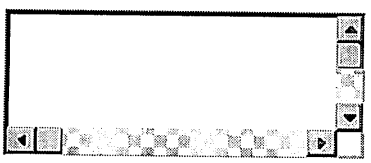
Other (please specify)



14. Please rate how often you watch YouTube or other Web 2.0 video for the following purposes:

	Very Rare	Rare	Sometimes	Often	Very Often	Not Applicable
Fun, entertainment	●	●	●	●	●	●
Personal learning	●	●	●	●	●	●
Study (e.g., preparing a course assignment)	●	●	●	●	●	●
Work	●	●	●	●	●	●
Communication with others (through posting comments)	●	●	●	●	●	●
News	●	●	●	●	●	●

Other (please specify below)



SECTION 5: PARTICIPATION IN 3-STAGE INTERVIEW

15. If you would like to share your experience about your learning and take part in a series of three interview, please provide your email below. All information you provide will be kept strictly confidential and under no circumstances will your individual responses be released to the University. I would greatly appreciate your taking the time to participate in a three-stage interview.

Appendix I: Students' Web Video Concerns and Levels of Use Survey

All survey data will be kept confidential and is only reported in aggregate form for research purpose only. The collected data will not be used to evaluate you or your instructor. Time needed to complete the questionnaire - 10 to 15 minutes.

THANK YOU FOR TAKING TIME TO COMPLETE THIS TASK.

For continuity in processing this data, please enter your student identification number.

SECTION 1: YOUR CONCERNS ABOUT WEB VIDEO

Please mark each item on a 0 to 7 scale in terms of YOUR PRESENT CONCERNS, or how you feel about your involvement with Web video at the present time. For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you DO have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

0 - This statement seems IRRELEVANT to me.
1 - This statement is NOT AT ALL TRUE of me at this time.
4 - This statement is SOMEWHAT TRUE of me now.
7 - This statement is VERY TRUE of me at this time.

	0	1	2	3	4	5	6	7
1. I am concerned about the value of Web video in learning.	●	●	●	●	●	●	●	●
2. I now know of some other approaches that might work better.	●	●	●	●	●	●	●	●
3. I don't even know what Web video is.	●	●	●	●	●	●	●	●
4. I am concerned about not having enough time to organize my study each day.	●	●	●	●	●	●	●	●
5. I would like to help other students in their use of Web video.	●	●	●	●	●	●	●	●
6. I have a very limited knowledge about Web video.	●	●	●	●	●	●	●	●
7. I would like to know the effect of reorganization on my study.	●	●	●	●	●	●	●	●
8. I am concerned about conflict between my interests and my responsibilities.	●	●	●	●	●	●	●	●
9. I am concerned about revising my use of Web video for learning.	●	●	●	●	●	●	●	●
10. I would like to collaborate with other students using Web video.	●	●	●	●	●	●	●	●
11. I am concerned about how Web video affects learning and knowledge building.	●	●	●	●	●	●	●	●
12. I am not concerned about the use of Web video at this time.	●	●	●	●	●	●	●	●
13. I would like to know who will make the decisions in the choice of Web video.	●	●	●	●	●	●	●	●
14. I would like to discuss the possibility of using Web video.	●	●	●	●	●	●	●	●
15. I would like to know what resources are available if the instructor decides to integrate Web video in the course.	●	●	●	●	●	●	●	●

16. I am concerned about my inability to manage all that the integration of Web video requires.	●	●	●	●	●	●	●	●
17. I would like to know how my learning is supposed to change.	●	●	●	●	●	●	●	●
18. I would like to familiarize others (e.g., students, instructors, colleagues, etc.) with the use of Web video.	●	●	●	●	●	●	●	●
19. I am concerned about the quality of Web video and how it impacts the quality of learning and knowledge building.	●	●	●	●	●	●	●	●
20. I would like to revise my approach of using Web video for learning.	●	●	●	●	●	●	●	●
21. I am completely occupied with other things.	●	●	●	●	●	●	●	●
22. I would like to modify my use of Web video based on the experiences of other students.	●	●	●	●	●	●	●	●
23. Although I don't know much about Web video, I spend little time thinking about its use in learning.	●	●	●	●	●	●	●	●
24. Web video makes learning interesting, challenging, and authentic.	●	●	●	●	●	●	●	●
25. I am concerned about time spent working with non-academic problems related to the integration of Web video.	●	●	●	●	●	●	●	●
26. I would like to know what the use of Web video will require in this course.	●	●	●	●	●	●	●	●
27. I would like to coordinate my efforts with others to maximize the effects of Web video.	●	●	●	●	●	●	●	●
28. I would like to have more information on time and energy commitments required by the integration of Web video in the course.	●	●	●	●	●	●	●	●
29. I would like to know what other students are doing with Web video.	●	●	●	●	●	●	●	●
30. At this time, I am not interested in learning about Web video.	●	●	●	●	●	●	●	●
31. I would like to determine how to supplement, enhance, or replace the use of Web video in my learning.	●	●	●	●	●	●	●	●
32. I would like to use other students' feedback about the use of Web video to change my approach to knowledge building and learning.	●	●	●	●	●	●	●	●
33. I would like to know how my role as a student will change when I'm using Web video.	●	●	●	●	●	●	●	●
34. Coordination of learning tasks and technologies is taking too much of my time.	●	●	●	●	●	●	●	●
35. I would like to know how Web video is better than what we have now.	●	●	●	●	●	●	●	●

SECTION 2: YOUR LEVEL OF WEB VIDEO USE

36. Please read the descriptions of each of the eight levels related to adoption of Web video. Choose the level that best fits where you are in the adoption of Web video at this time.

- I have little or no knowledge of Web video in education, no involvement with it, and I am doing nothing toward becoming involved.
- I am seeking or acquiring information about Web video in education.
- I am preparing for the first use of Web video in learning.
- I focus most effort on the short-term, day-to-day use of Web video with little time for reflection. My effort is primarily directed toward mastering tasks required to use Web video.
- I feel comfortable using Web video in knowledge building and learning. However, I am putting forth little effort and thought to improve my approach to use Web video in learning.
- I vary the use of Web video in learning to increase the expected benefits. I am working on using Web video to maximize the effects of my learning.
- I am combining my own efforts with other technologies and/or other students to achieve greater impact on my knowledge building and learning.
- I re-evaluate the quality of use of Web video in learning, seek major modifications of, or alternatives to, present innovation to achieve increased impact, examine new developments in the field, and explore new goals for myself and my learning.

Appendix J: Web Video Affordances and Constraints Survey

All survey data will be kept confidential and is only reported in aggregate form for research purpose only. The collected data will not be used to evaluate you or your instructor. Time needed to complete the questionnaire - 5 to 10 minutes.

THANK YOU FOR TAKING TIME TO COMPLETE THIS TASK.

For continuity in processing this data, please enter your student identification number

SECTION 1: BARRIERS, CONSTRAINTS, AND CHALLENGES

1. Based on your current experiences, please describe in your own words WHAT YOU LIKE LEAST about Web video (e.g., YouTube video)?

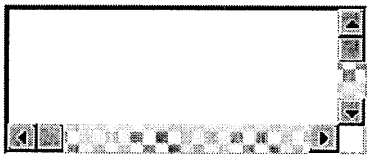
What do you currently think to be the biggest problems in using video sharing websites (e.g., YouTube)? Using the scale provided, please rate the extent to which you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
2. Not being able to find the video I am looking for.	●	●	●	●	●
3. Not being able to efficiently store and organize the videos I find.	●	●	●	●	●
4. Not being able to find the video I know is out there.	●	●	●	●	●
5. Not being able to return to the video I once watched.	●	●	●	●	●
6. Not being able to determine where I am (i.e., lost in the video sharing community).	●	●	●	●	●
7. Not being able to visualize where I have been and where I can go (e.g., view portions of video sharing networks and their tools).	●	●	●	●	●
8. Rapid growth of video sharing networks (e.g., too many networks, don't know which one to use).	●	●	●	●	●
9. It takes too long to view a video clip.	●	●	●	●	●
10. Not being able to download a video clip to my computer / jump drive.	●	●	●	●	●
11. Having problems with my browser (e.g., freezing up, poor interface, getting disconnected, timing out)	●	●	●	●	●
12. Limited bandwidth / Slow connection	●	●	●	●	●
13. Technical problems with Web video sharing networks (e.g., each network has its own unique interface, layout, and functionalities).	●	●	●	●	●

What do think to be the biggest PROBLEMS, CHALLENGES, or BARRIERS to using Web 2.0 videos in learning at the university level? Using the scale provided, please rate the extent to which you agree or disagree with the following statements regarding the potential barriers to your using Web 2.0 video in learning.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
14. Web video is more hype than fact.	●	●	●	●	●
15. Lack of understanding of what Web video really is.	●	●	●	●	●
16. Use of Web video requires an additional training in using Web video (e.g., using YouTube, embedding video into a blog, producing a video, etc.).	●	●	●	●	●
17. Feeling anxious about the credibility of the person who publishes Web video (e.g. might contain biased and questionable information).	●	●	●	●	●
18. Feeling anxious about the quality of the content of Web video (e.g., poor audio/video quality, grammatical errors).	●	●	●	●	●
19. Insufficient instructor's support in how to use Web video effectively (e.g., vague instructions, lack of support with using video technology).	●	●	●	●	●
20. Lack of learning management skills.	●	●	●	●	●
21. Lack of confidence when using Web video.	●	●	●	●	●
22. Lack of basic Internet skills.	●	●	●	●	●
23. Anxieties about the negative impact of Web video on learning.	●	●	●	●	●
24. Use of Web video results in neglecting important traditional learning resources (e.g., scholarly journals, textbooks).	●	●	●	●	●
25. Learning with Web video takes too much time.	●	●	●	●	●

26. Please elaborate (e.g., state why you agree or why don't you agree) on any three (3) of the barriers you have rated above.

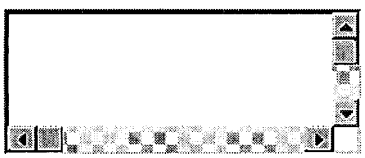


SECTION 2: MOTIVATORS, AFFORDANCES, AND BENEFITS

27. Which of the following Web 2.0 technologies do you consider "INDISPENSABLE" for learning? Using the scale provided, please rate the following:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Professional audio podcasts, such as iTunes podcasts, lecture podcasts, news podcasts, and the like	●	●	●	●	●
Professional online video, such as iTunes video podcasts, video lectures, educational video presentations, and the like.	●	●	●	●	●
User-created Web video (e.g., YouTube)	●	●	●	●	●
Blogs	●	●	●	●	●
Wikis	●	●	●	●	●
Social networks (e.g., Facebook, Myspace)	●	●	●	●	●

28. Based on your current experiences, please describe in your own words WHAT YOU LIKE MOST about Web video (e.g., YouTube video)?



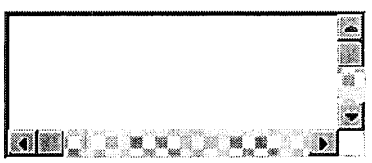
Which of the following qualities of Web video do you consider beneficial for your learning? Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
29. Web videos are entertaining.	●	●	●	●	●
30. Web videos come from many of sources with varying degrees of content oversight.	●	●	●	●	●
31. Web videos offer multiple perspectives on the issue.	●	●	●	●	●
32. Web videos represent real-life issues.	●	●	●	●	●
33. Web videos can be linked to or embedded into other websites.	●	●	●	●	●

What do you think to be the biggest benefits in using Web video in learning? Please indicate to what extent you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
34. Use of Web video increases academic achievement.	●	●	●	●	●
35. Use of Web video motivates me to get more involved in learning activities.	●	●	●	●	●
36. Use of Web video makes learning more challenging.	●	●	●	●	●
37. Use of Web video makes learning more authentic.	●	●	●	●	●
38. Use of Web video enables me to explore broadly other people's ideas and perspectives.	●	●	●	●	●
39. Web videos help to set the context.	●	●	●	●	●
40. Web videos help to visualize ideas and theoretical concepts.	●	●	●	●	●
41. Web videos enhance understanding of theoretical concepts.	●	●	●	●	●
42. Web videos help to focus attention on topic.	●	●	●	●	●
43. The integration of Web video enables me to work through course material at my own pace.	●	●	●	●	●
44. The use of Web video promotes collaboration with my fellow students.	●	●	●	●	●
45. The use of Web video gives me an opportunity to be an active participant instead of "a consumers of information."	●	●	●	●	●
46. Production of Web video promotes the development of online communications skills (e.g., writing and presentation skills)	●	●	●	●	●

47. Please elaborate (e.g., state why you agree or why don't you agree) on any three (3) of the statements you have rated above.



Appendix K: Web Video Impact Survey

All survey data will be kept confidential and is only reported in aggregate form for research purpose only. The collected data will not be used to evaluate you or your instructor. Time needed to complete the questionnaire - 15 to 20 minutes.

THANK YOU FOR TAKING TIME TO COMPLETE THIS TASK.

For continuity in processing this data, please enter your student identification number.

SECTION 1: YOUR ASSESSMENT OF INTERNET AND WEB 2.0 TECHNOLOGY SKILLS

1. How many hours per WEEK did you spend using the Internet?

- 1 to 5 hours
- 5 to 10 hours
- 10 to 15 hours
- 15 to 20 hours
- More than 20 hours

2. On average, how often did you access video sharing websites (e.g., YouTube) for search and viewing Web videos?

- Once a week
- A few times a week
- Once a day
- A few times a day
- Many times a day

3. Please select which of the following video sharing websites you have used on this project. Mark those which apply.

- YouTube
- BlipTV
- DailyMotion
- MetaCafe
- Veoh
- TeacherTube
- EduTube
- Viddler
- Other

If Other, please specify below.

4. How would you rate your Internet and Web 2.0 skills? Using the scale provided, please rate each of the following skills:

	None	Extremely Poor	Below Average	Average	Above Average	Excellent
Search the Web for information using search engines (e.g., Google, Yahoo, Bing, etc.)	●	●	●	●	●	●
Locate necessary information on the Web	●	●	●	●	●	●
Create and contribute to a blog	●	●	●	●	●	●
Create and contribute to a wiki	●	●	●	●	●	●
Search images over the Web using search engines (e.g., Google, Yahoo, Bing)	●	●	●	●	●	●
Search videos over the Web using search engines (e.g., Google, Yahoo, Bing)	●	●	●	●	●	●
Search videos using video sharing websites (e.g., YouTube, TeacherTube, BlipTV, etc.)	●	●	●	●	●	●
Embed Web video (such as YouTube video) into a blog	●	●	●	●	●	●
Produce a digital video	●	●	●	●	●	●
Upload digital video to the Web	●	●	●	●	●	●
Use drawing or paint programs (e.g., Paint, Photoshop, and the like)	●	●	●	●	●	●

SECTION 2: YOUR PERCEPTIONS OF VIDEO ENHANCED BLOGGING ACTIVITY

5. Once you had found Web 2.0 videos you needed, what were the most decisive factors for you to select a relevant video for your weblog? Please rate the IMPORTANCE to you of each of the following factors, using a scale where 1 is Not at all Important and 5 is Extremely Important.

	1	2	3	4	5
Web video is relevant to a weekly topic (e.g., assistive technology, web 2.0 ethics, e-portfolio).	●	●	●	●	●
Web video is relevant to the content of the assigned article.	●	●	●	●	●
Web video illustrates one of the concepts depicted in the assigned article.	●	●	●	●	●
Web video represents a real-life situation.	●	●	●	●	●
Web video represents an example of practical application.	●	●	●	●	●
Web video is controversial and challenges the discourse of the article.	●	●	●	●	●
Web video is enjoyable to watch regardless of whether it is related to the article.	●	●	●	●	●

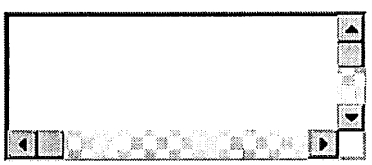
If Other, please specify below.

6. Read carefully the following statements and indicate to what extent you agree or disagree with each statement:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
The combination of Web video helped me develop a position on the topics studied.	●	●	●	●	●
The combination of Web video with blogging encouraged me to question knowledge (ideas, perspectives) presented in scholarly articles.	●	●	●	●	●
The combination of Web video with blogging helped me engage in thoughtful reading and reflect on what I read.	●	●	●	●	●
The combination of Web video with blogging helped me appreciate others' opinions and perspectives.	●	●	●	●	●
As a result of using Web video in blogging, I was able to make new connections to the assigned readings.	●	●	●	●	●
I felt that the combination of Web video with blogging helped me take the issues to a deeper level.	●	●	●	●	●

SECTION 3: YOUR PERCEPTIONS OF WEB VIDEO PRODUCTION ACTIVITY

7. How much did your involvement in producing your own video reinforce your understanding of assistive technology? Please explain briefly your position.



8. Read carefully the following statements and indicate to what extent you agree or disagree with each statement below:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Being able to produce and share my own digital video over the Web gave me a voice within our learning community and beyond.	●	●	●	●	●
Web video production helped me clarify my ideas and knowledge about the topic (i.e., assistive technology).	●	●	●	●	●
Being able to produce and share digital video over the Web enabled me to share and discuss my ideas with others.	●	●	●	●	●
Sharing our web videos enabled me to see how differences of opinion are presented and conveyed in my peers' videos.	●	●	●	●	●
Web video production was not relevant to my learning needs.	●	●	●	●	●

SECTION 4: YOUR PERCEPTIONS OF WEB VIDEO MEDIATED LEARNING

9. When you think about the term "LEARNING," what does it mean to you? Consider each of these statements carefully, and then rate them in terms of how close they are to your own way of thinking about it.

	Very close	Quite close	Not so close	Rather different	Very different
Making sure you remember things well.	●	●	●	●	●
Developing as a person.	●	●	●	●	●
Building up knowledge by acquiring facts and information.	●	●	●	●	●
Using all your experience in life.	●	●	●	●	●
Being able to use the information you've acquired.	●	●	●	●	●
Understanding new material in a way that it makes sense to your own frame of reference.	●	●	●	●	●
Seeing things in a different and more meaningful way.	●	●	●	●	●

10. In terms of learning materials needed for building your knowledge and understanding, what priority would you give to the utilization of Web video?

- ● High Priority
- ● Mild Priority
- ● Unsure
- ● Low Priority
- ● No Priority

11. What type of Web video would you prefer to utilize for your learning? Use a rating scale where 1 is least preferred and 5 is most preferred.

	1	2	3	4	5
Web video produced by instructor	●	●	●	●	●
User-created video (such as YouTube video)	●	●	●	●	●
Professional web video coming from an established media publishing company	●	●	●	●	●

12. How did you weigh the risks and benefits of the integration of Web video into your learning?

SECTION 5: YOUR OVERALL SATISFACTION WITH THE WEB VIDEO PROJECT

13. Having participated in this project, would you seek out such projects/courses in the future?

- Definitely Not
- Probably Not
- Maybe
- Cautiously Yes
- Definitely Yes

14. Overall, how did the project make you feel?

15. Read carefully the following statements and indicate to what extent you agree or disagree with each statement:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I enjoyed working with Web 2.0 video on this project	●	●	●	●	●
The project concentrated on the subject content, on what I had to learn.	●	●	●	●	●
In this project I was provided with detailed instructions on what to do and how to do it.	●	●	●	●	●
I learned new skills using the technologies on this project.	●	●	●	●	●
The technologies I used on the project might help me in my future teaching career.	●	●	●	●	●

16. Please list key learnings or take-aways gained during the six-week project.

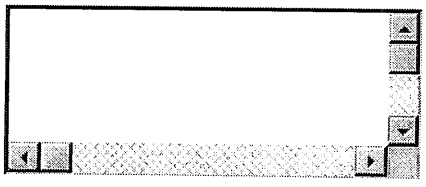
17. Please give examples of how you have been applying what you learned on this project and the difference it is making.

18. Is there anything else you would like to tell us about this project?

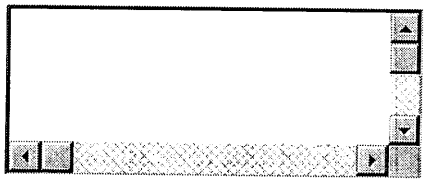
Appendix L: Midpoint Feedback Survey

For continuity in processing this data, please enter your student identification number.

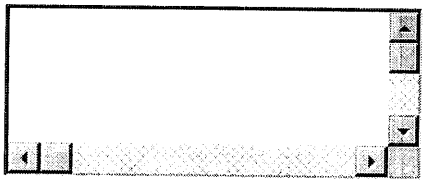
1. What are your current perceptions about the Web Video Project (i.e., blogging, embedding Web video, producing your own digital video)? Have your expectations been met?



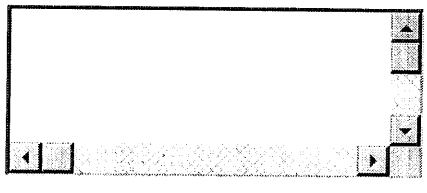
2. Based on your experience over the past three weeks, what aspects of this Project you find encouraging and motivating? Please state why or why not.



4. What problems or challenges have you been experiencing since the launch of this Project? What elements of this Project are making it difficult to learn? Why?



5. In your opinion, what changes are needed in relation to this Project?



Appendix M: Interview Schedule

A GUIDE FOR A THREE-STAGE INTERVIEW WITH STUDENTS

Each interview with students will last 35 minutes and will be digitally recorded using a digital audio recorder and later transcribed for the interpretation purpose only. Student's name will be kept strictly confidential and will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. Confidentiality will be provided to the fullest extent possible by law.

First round of interviewing

Purpose: To talk about participant's previous experience with Web video.

Sequence of topics to use for interviewing students:

- *Questions about Understanding of Web Video.* E.g., What do you know about Web video? What does the rise of user-generated video content (open concept, easily accessed and shared) mean for you?
- *Questions about Previous Experience with Web Video.* E.g., How would you describe your experience with Web video before taking this course?
- *Questions about Previous LEARNING Experiences with Web Video.* E.g., Based on your previous experiences, could you think of what were most frustrating and most beneficial in your learning experience with watching/using Web video? Can you give me an example of that experience?
- *Questions about the Relevance of Web Video to its Integration into University Learning.* E.g., What do you think are the affordances and challenges in bringing Web video to the instructional process at university?

Second round of interviewing

Purpose: To talk about concrete details of participant's current learning experience with Web video in the Project.

Sequence of topics to use for interviewing students:

- *Questions about Current Learning with Web Video.* E.g., What are your current perceptions about this Project? What's it like to use Web video to support learning? Can you walk me through how you use Web video in your learning? How would you describe the integration of Web video into the blogging assignment?
- *Questions about the Relevance of Web Video to its Integration into University Learning.* E.g., What do you think are the affordances and challenges in bringing Web video to the instructional process at university? Why do you feel Web video should be / should not be part of university course curriculum? Based on your current experiences, what do you think to be the biggest benefits in using Web video in learning?

Third round of interviewing

Purpose: To ask the participant to reflect on what the use of Web video means to him or her.

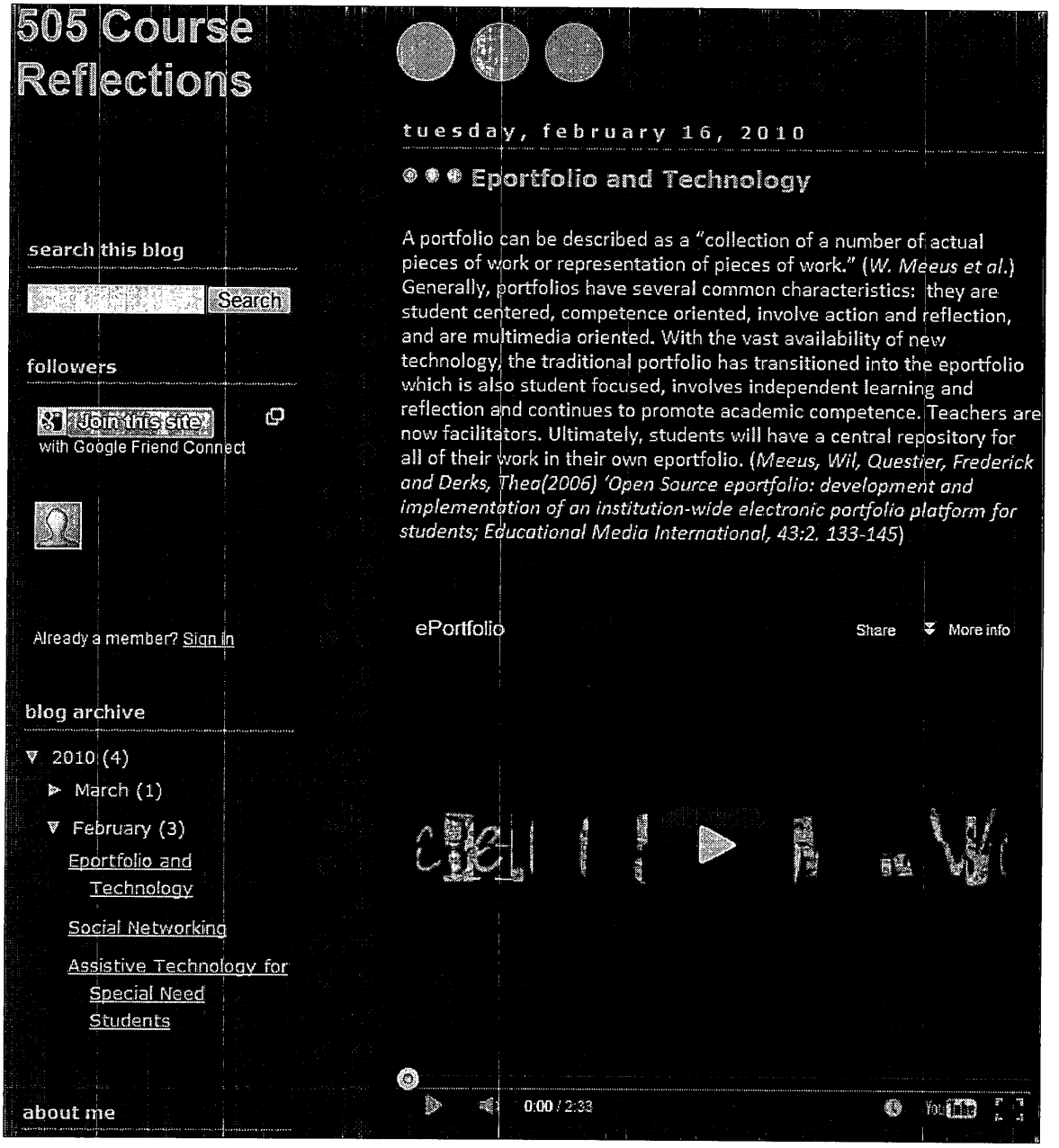
Sequence of topics to use for interviewing students:

- *Overall Learning Experience with Web Video.* E.g., What role did Web video play in your learning and knowledge building during this project? What benefits have you found for yourself while using Web video? What drawbacks have you found for yourself while using Web video? Given what you have said about your experience with Web video before your engagement with this Project and given what you have said about the use of Web video during this Project, how do you perceive Web video as a supplement to your learning?
- *Questions about Project Experience.* E.g., What kind of technology was more (or less) valuable for your learning: Web video, blogging, printed material? Have you accomplished the learning objectives/expectations you set yourself for this Project? How did the Project make you feel? How do you expect to use Web 2.0 video after this project? Given what you have reconstructed in these interviews, what do you think needs to be done so that the use of Web video will be meaningful?
- *Closing the Interview.* Is there anything about the use of Web video or the production of video that you would improve? Is there anything else you would like to tell about this Project?

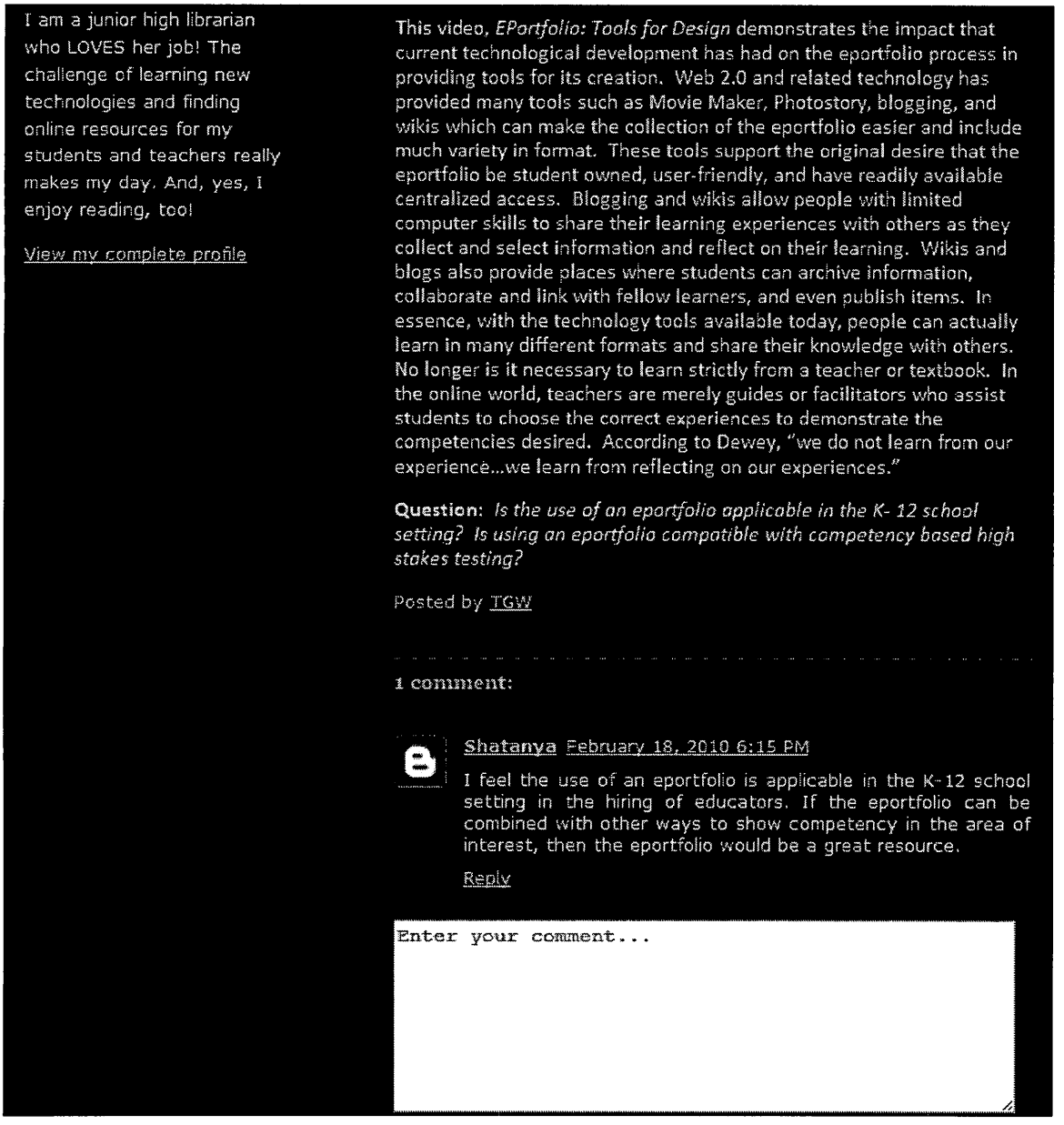
Appendix N: Interview Guide for Instructors

Focus of interview	Interview questions
Perceptions about the Project	• What do you make of this project? • What have you learned from this project? • Are you satisfied with students' performance during the project? What kinds of complaints have you heard from your students? • Have anyone one dropped out because of the project? • What do you think about the use of self-assessment rubrics?
Thoughts about the use of web video as a supplement to traditional learning resources:	• What do you think are the factors that make YouTube so powerful among university students? • What are the challenges in bringing web video to university instruction? • Why do you feel that web video should be part of university course curriculum? • What pedagogical benefits of web video have you seen during this Project?
Use of web video in further teaching:	• What factors will influence your decision to integrate Web video in your future classes? • Is there anything about the Project you would change?

Appendix O: Sample of Participant's Video-Enhanced Blog Posting

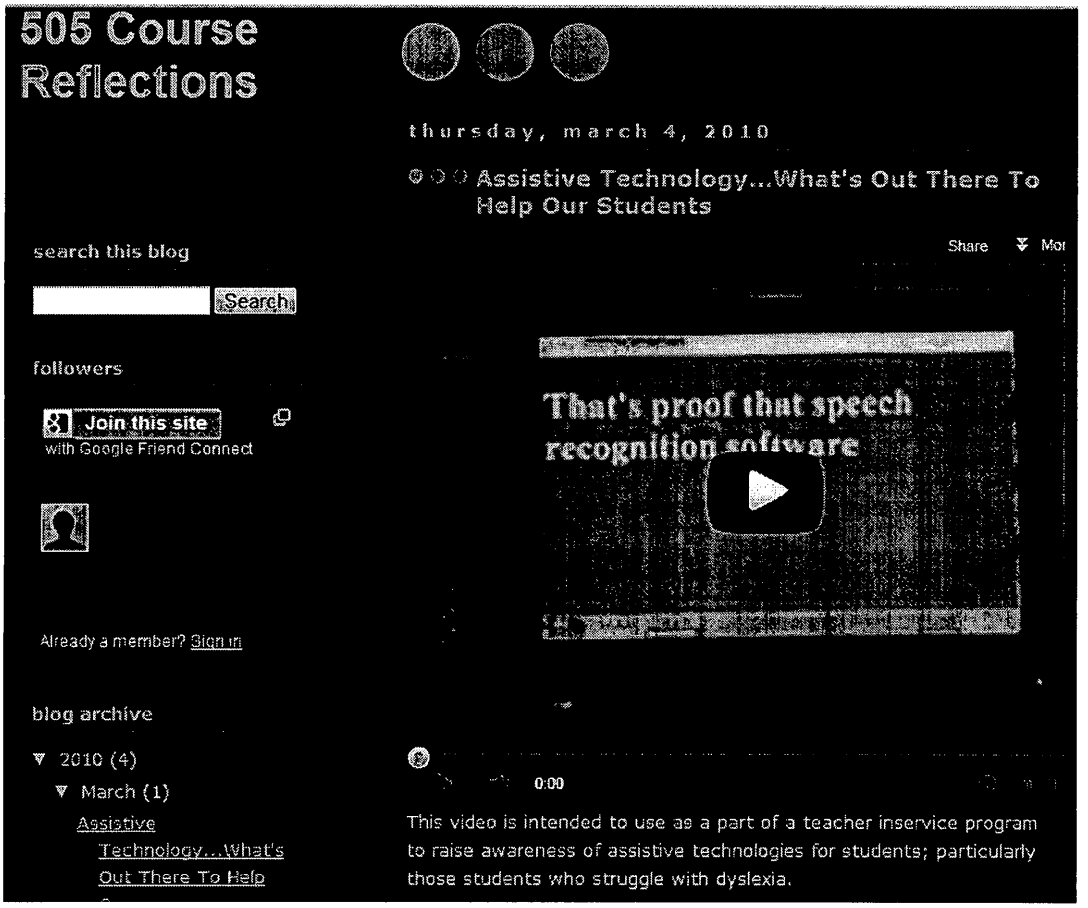


Description 1. Screenshot of participant's blog entry. It includes a summary of the article and a relevant YouTube video.

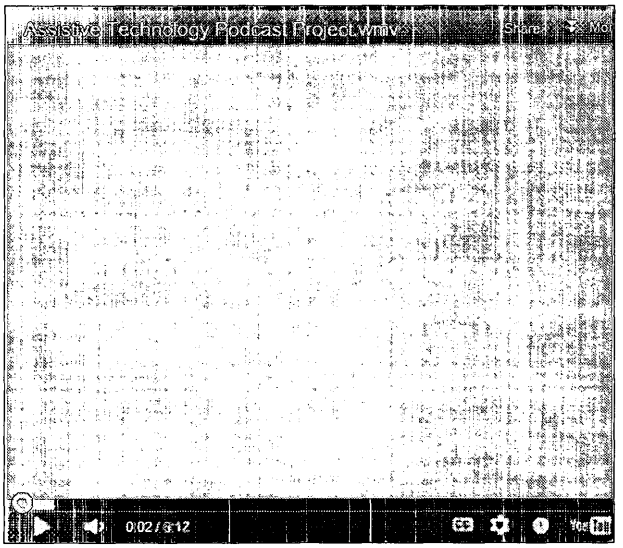


Description 2. Screenshot of participant's blog entry (continued). It includes the reflection and the rationale for embedding the self-selected YouTube video in the blog, a thought-provoking question, and peer's commentary on the blog entry.

Appendix P: Sample of Participant's Web Video



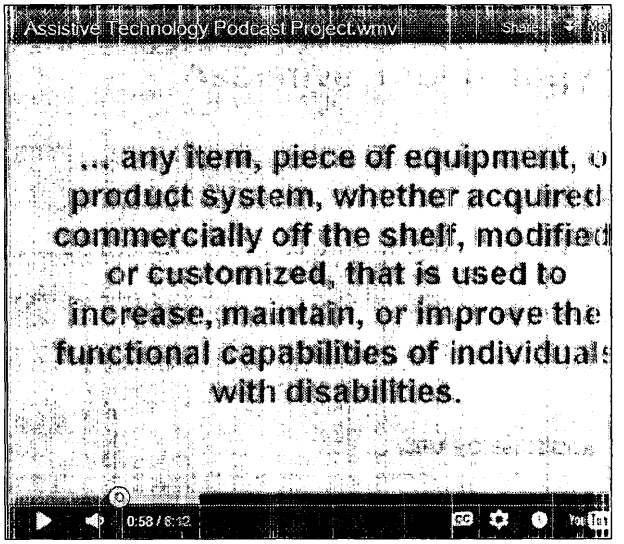
Description 3. Screenshot of participants' own web video embedded into the blog. It includes the title, the video clip, and its purpose. This web video represents an introduction-type video program aimed at raising awareness of assistive technology in a public school.



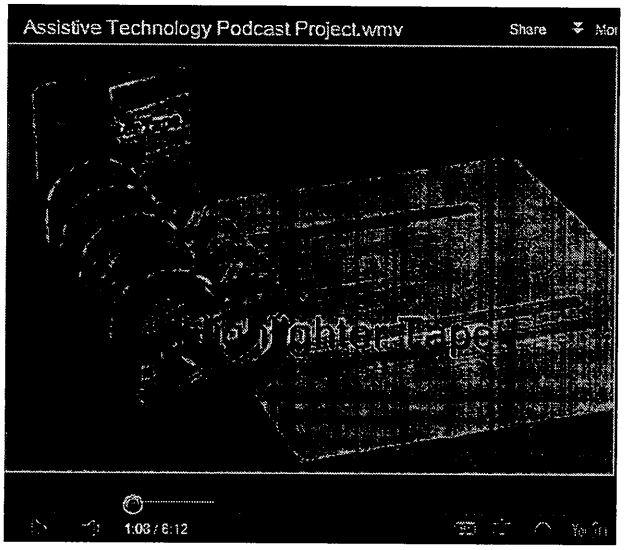
Description 4. Screenshot of participant's web video. It begins with the title animation that is shown on a blank background.

Description 5. Screenshot of participant's web video (continued). In a series of clips, the participant interviewes her colleagues about their use of assistive technology in their classrooms.

Description 6. Screenshot of participant's web video (continued). To record interviews, the participant captured interview scenes with FlipCam, and then selected fragments of the digital video footage were incorporated in the video.

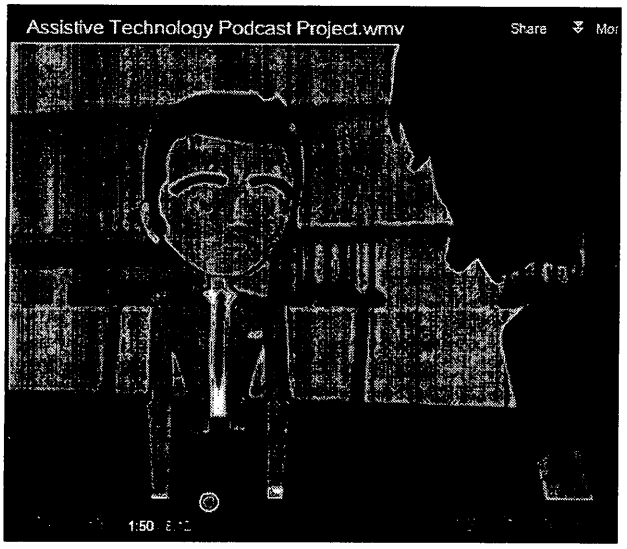


Description 7. Screenshot of participant's web video (continued). This clip introduces a definition of assistive technology. This fragment was created by incorporating a PowerPoint slide into the video.

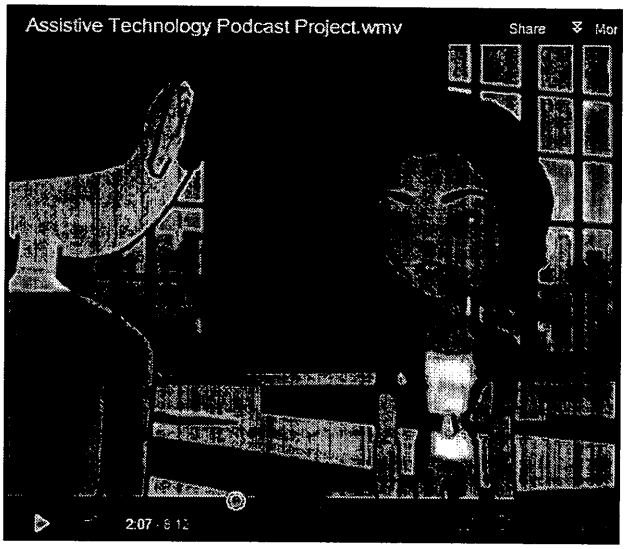


Description 8. Screenshot of participant's web video (continued). This fragment shows an example of assistive technology (highlighter tape). The participant added an existing image of the technology to the video and then displayed a title over the video to introduce the technology.

Description 4. Screenshot of participant's web video (continued). This fragment depicts another example of assistive technology (touchscreen). The participant also added royalty-free audio of soft music in the background of the video to create a relaxing atmosphere.

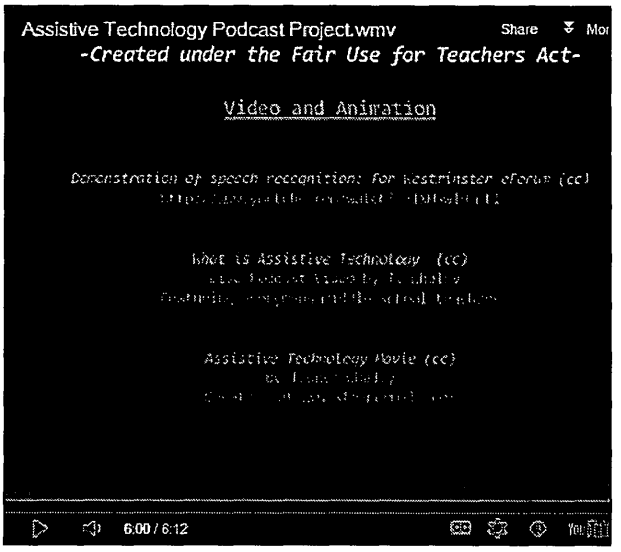


Description 10. Screenshot of participant's web video (continued). This fragment shows an interactive conversation between two teachers discussing ways to support the dyslexic student.



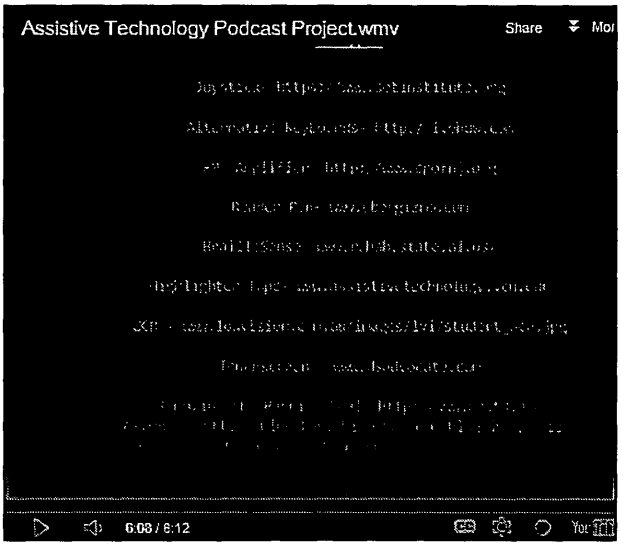
Description 11. Screenshot of participant's web video (continued). With the help of Xtranormal, the participant created interactive animation and then incorporated it into the video.

Description 52. Screenshot of participant's web video (continued). In this clip, the participant incorporated a fragment from existing YouTube video. This fragment depicts a real-life example of how an individual with dyslexia can benefit from using Dragon Naturally Speaking (voice recognition software).



Description 13. Screenshot of participant's web video (continued). At the end of the video, the participant acknowledged how others contributed to this video. This fragment tells the viewer who produced the video.

Description 64. Screenshot of participant's web video (continued). This fragment references music and sound clips, and software that was used to produce the video.



Description 75. Screenshot of participant's web video (continued). This fragment references images used in the video.