EXPLORING THE IMPACT OF MEDIA LITERACY INSTRUCTION AND VIDEO PROJECTS IN A COLLEGE TECHNOLOGY COURSE

by

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A.A. Cloud County Community College, 1997
B.S. Kansas Wesleyan University, 1999
M.S. Fort Hays State University, 2004

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Curriculum and Instruction
College of Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2015

Abstract

This study explored the impact of requiring a video term-paper project and media literacy instruction to address the desired educational goals of increasing student ownership of learning, learning course-related concepts, providing evidence of communication skills, and increasing knowledge of key media literacy concepts.

Study participants came from convenience samples drawn from a technology course taught by the researcher and from a writing course taught by a colleague. The sixty participants were male (41) and female (19) college students in different years of their courses of study. Participants comprised traditional-age (18-24) and non-traditional-age (25+) students possessing varying levels of familiarity with the skills examined.

A quasi-experimental, two-group control/intervention design was used, augmented by additional data collected from the intervention group. The quasi-experiment consisted of pre-and post-test measurements of media literacy, with both groups receiving media literacy instruction an intervention in the form of a video term-paper research project completed by the intervention group. Additional data were gathered from student surveys and interviews conducted with the intervention group.

The quasi-experiment did not provide evidence that either the media literacy instruction or the video term-paper project increased knowledge of media-literacy concepts. However, the data collected indicated that the video project was a relevant challenge that engaged students in active participation in their learning.

Despite the inherent difficulties in the use of writing and communications skills in technology classes, science and technology educators should investigate the benefits of using media projects in their courses.

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Dedication

This work is dedicated to the two men who inspired me to undertake this project: my father, Darrell Genereux, who was a life-long educator in Kansas public schools and also a graduate student of the K-State College of Education, and my father-in-law, the late Dr. Everett Sechtem, a professor of Economics at the University of Nebraska, Kearney.

Chapter 1 - Introduction

Background for the Study

Technology is changing how we think and how we live—sometimes in ways we might not even consider. In 2008, Nicholas Carr wrote an article for *The Atlantic Monthly* entitled "Is Google Making Us Stupid?" Carr noticed how his own thinking had been reshaped into something new, and he suspected it was due to the conditioning effects of using digital technology.

> I'm not thinking the way I used to think. I can feel it most strongly when I'm reading. Immersing myself in a book or a lengthy article used to be easy... Now my concentration often starts to drift after two or three pages...The deep reading that used to come naturally has become a struggle (Carr, 2008, p. 56).

Carr (2008) suggested that because the Internet now plays a critical role in our lives, it exerts a stronger influence over our thoughts and behaviors than previous communication systems; yet, there has been little consideration of how it may be reprogramming us. In 2010, Carr wrote *The Shallows* as a follow-up to his initial magazine article (Carr, 2010). Other authors, such as Andrew Keen (2007), Sherry Turkle (2011) and Douglas Rushkoff (2010), also have written cautionary works discussing the hidden influences and potential harmful effects related to digital connectedness. Other writers, including Yochai Benkler (2006), Cathy N. Davidson (2011), and Clay Shirkey (2008, 2010), have written about the benefits of digital connectedness. In a recent Pew Internet and American Life report entitled "Millennials Will Benefit and Suffer Due to Their Hyperconnected Lives (Anderson & Rainie, 2012)," technology experts were surveyed about the future of hyper-connected young people. Among these experts, there was an almost even division of opinions about the future for young adults. According to the report:

> Analysts generally believe many young people growing up in today's networked world and counting on the Internet as their external brain will be nimble analysts and decision-makers who will do well. But these experts also expect that constantly connected teens and young adults will thirst for instant gratification and often make quick, shallow choices (p. 1).

Prior to the development of what Benkler (2006) called the networked information economy, the means of producing the world's information, including that produced by printing presses, was controlled largely by professional media makers. However, producing and distributing information is now becoming accessible to a much larger segment of the world's population:

> The material requirements for effective information production and communication are now owned by numbers of individuals several orders of magnitude larger than the number of owners of the basic means of information production and exchange a mere two decades ago (Benkler, 2006, p. 4).

Before the networked information economy, every increase in the availability of information required a proportional expenditure of capital (Benkler, 2006). The recent shift in information production—due to the drastic reduction in costs of production, storage, and distribution of information through digital media—has placed the means of production within the reach of billions, rather than an elite few.

As Shirkey (2010) has suggested, we are in the midst of transformational times with new technologies that impact nearly every aspect of our lives. "We live, for the first time in history, in a world where being part of a globally interconnected group is the normal case for most citizens" (Shirkey, 2010, p. 23). Having awareness of technology's influence on our thinking, our perceptions, and our lives is an important skill for living in the digital age. This revolution in information technology has rewritten the rules for how the world operates. Upon examination, though, we find that the schools in which we prepare young people for life in this digital world often fail to reflect the reality of the revolution that is taking place.

We are presently experiencing, for just the second time in human history, a complete shift in the very nature of what it means to be literate. The first such seismic shift in literacy occurred in the 15th century with the introduction of the printing press (Scheibe & Rogow, 2012, p. 1). Historically, one of the central purposes of formalized education was the teaching of literacy. The etymology of the adjective "literate" is derived from the Latin word *literatus* meaning "educated, learned" translated as "one who knows the letters" (Harper, 2013). Indeed, the Latin root word of "literate" is *litera* ("the letter"), so we can immediately see the direct link between the historic definition of literacy and the reading and writing of alphabetic letters. For centuries,

literacy has meant possessing the ability to read and write. The related tools of literacy were pen and paper.

Human beings have long used tools other than pen and paper for recording their thoughts and ideas. Paleolithic cave paintings found in Lascaux, France, dating back some 10,000 to 15,000 years, depict various animals and may depict a hunting narrative (Figure 1). A modern thinker might not consider such paintings as "writing," but the author of these early "texts" might easily have conceptualized them as such. This was not the beginning of art. Rather, it was "the dawning of visual communication, because these early pictures were made for survival, and for utilitarian and ritualistic purposes" (Meggs & Purvis, 2006, p. 4). The early cave paintings depict scenes that even small children could "read." Although they are symbolic, these paintings visually represent events that are simple enough to interpret. Indeed, images laid the foundation for what we today recognize as literacy.

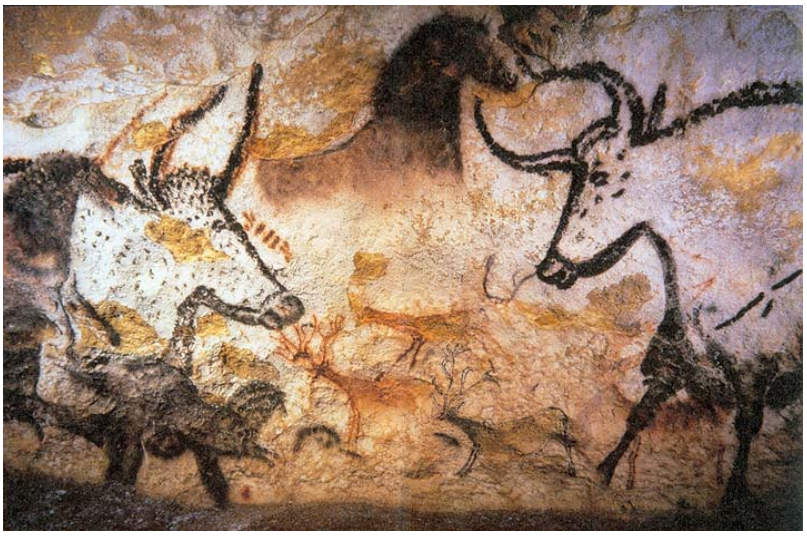


Figure 1. Lascaux cave painting (Saxx, 2006).

Eventually, recording ideas as images evolved into what we now know as writing. The earliest known written records are those found on the clay tablets of Sumer circa the 3 or 4th century B.C. (Figure 2). Formed from the mud of the rivers of the Fertile Crescent, these tablets are thought to be the records of prehistoric accountants tabulating agricultural and manufactured goods whose marks were scratched into the clay with a sharpened stick or stylus (Bromley, 2010; Carr, 2010; Meggs & Purvis, 2006). With the technological advance of writing began a transformation of the human psyche. By making written records, recorded thoughts became

abstractions in which the marks contained information meaning something entirely different than what was depicted in their outward appearance.

Figure 2. Clay tablet of ancient Sumer (Collins, 2010)

Writing, by its nature, contains a level of abstraction that involves the encoding of ideas with an expectation that someone will later decode them through the process of reading. Comprehending this new level of complexity is not innate to humans, explaining our need to "learn" to read (Poe, 2012). By adopting the technology of reading and writing, we give up simple interpretation in favor of a more concise and portable recording of thoughts and ideas.

We often behave as though adopting new technologies comes without any costs. Kevin Kelly, author of the book *What Technology Wants*, argues that some experts who examine this issue overestimate the cost/benefit ratio of technology adoption. In Kelly's estimation, the cost/benefit ratio might be close to a 50/50 split, with the positive benefits of adoption having only a slight advantage over the negative costs (Kelly, 2010). In any case, it is important to recognize that the costs of technology adoption do exist and often are hidden from view. Neil Postman (2005) suggests that ignoring the costs misses an important truth about technology:

> To be unaware that a technology comes equipped with a program for social change, to maintain that technology is neutral, to make the assumption that technology is always a friend to culture is, at this late hour, stupidity plain and simple (p. 157).

Just as the adoption of writing added complexity to our lives, the adoption of new digital communications tools such as computers and computer networks adds complexity as well (Bromley, 2010). Each new technology requires new ways of coping and adapting to the new environment:

> Feedback from an expanded audience offers tremendous possibilities for dialogue, collaboration, and the generation of new knowledge. But the ability to quickly connect with each other will have other outcomes. For example, we may experience mental stress and sensory overload as we are bombarded by more electronic input. Or, this sensory overload may cause us to deliberately ignore possibilities as we read more narrowly so as not to be overwhelmed by the possibilities of online print (Bromley, 2010, p. 100).

It takes attention, self-awareness, and an understanding of the various forms of media we use to recognize that this is happening and to make conscious decisions that are in our best interests (Davidson, 2011; Rheingold, 2012). In other words, we need to be literate in ways that align with the digital environment.

Redefinition of Literacy

We now live immersed in digital technologies. From mobile smart phones to high-speed Internet connections to video on demand and digital video recorders, the tools and toys of always-on digital media are present everywhere we turn. This affects each of us in both positive and negative ways; but as Carr (2008) notes, we rarely pause to consider exactly how we are being affected. To counter digital media's potential for causing ill effects, Postman (2005) makes a strong case for meaning-making through a sophisticated understanding of it, stating that "only through a deep and unfailing awareness of the structure and effects of information, through a demystification of media, is there any hope of our gaining some measure of control over television, or the computer, or any other medium" (p. 161).

Educators are concerned with developing the literacy skills of students, which traditionally has meant the mastery of reading and writing through print media. Various forms of electronic communications media, such as phonograph records, radio, and film (Wei, 2012), have been around for more than a century, but the teaching of literacy with electronic media is not as widespread as the teaching of print literacy. There is evidence to suggest that "education as an institution is populated by persons who work to preserve practices of the past, few of which depend on or explore the advantages of digital literacies" (O'Brien & Scharber, 2008).

Video Literacy

Perhaps the most familiar form of non-textual media found within the mainstream of education is the motion picture, a form of communication that Elizabeth Daley, Dean of the USC

School of Cinematic Arts, refers to as "the language of the screen" (Daley, 2003). Television has been an important part of the culture in the United States for more than half a century, and motion pictures for even longer than that. Only with the introduction of inexpensive and accessible digital video tools during the past two decades have non-professionals outside of these mainstream media fields had practical and widespread access to creating and publishing in these media forms.

The low-cost availability of new digital networks, computing power, and software tools combined with the microminiaturization of digital cameras has created a new reality of any-place, any-time digital video. Young people are already creating and publishing videos on the Internet, often without adult assistance or supervision. Meanwhile, a many young-adult college students have completely missed this technological advance, limiting their communication tools to those that are the least complicated and most familiar to them (Kvavik & Caruso, 2005; Schmidt, 2013).

Historically, text, pictures, and sound were created with distinct and separate processes. Photography required film and chemical processing. Audio recordings were made with magnetic tapes. Typewriters and typesetting machines produced the printed page. However, new media are composed of digital information—ones and zeros—regardless of whether they represent sound, pictures, or text. The effect of this convergence has been to "reduce the privileged place of written text in Western culture" (Cope & Kalantzis, 2010, p. 96), with visual and other modes having a greater role.

From the inception of the World Wide Web in the early 1990s, futurists and educational visionaries (Gates, 1996; Papert, 1993) envisioned schools immersed in technology. The promise of an "information superhighway" that would connect classrooms to the world in never-before-possible ways is yet to be realized for many, with a whole generation of schoolchildren who experience much of their education in low-tech environments.

Use of Digital Media in Higher Education

Possibilities for expanding the learning beyond four walls of a classroom by using new media technologies exist, but relatively few students in higher education fully experience what is available. Although 40% of college faculty now use blogs, wikis, and other social media in their teaching (Rogers, 2013), the ability of faculty members to integrate technology into teaching is

still a concern (Winston, 2013). We appear to still be in the early stages of reimagining possible uses of technology in higher education.

With popular course-management systems such as Blackboard, proprietary curricula that include multimedia content can be purchased for certain textbooks. Many professors are turning to YouTube as a source of entertaining video content for use in classes. Others are using new technologies, such as podcasting, for dissemination of course material. However, these technologies are typically utilized with a 20th-century approach to media that puts students in the position of consumers rather than creators of media (Shirkey, 2010). This is a cause for concern; some media scholars argue that the production of digital media offers students a chance to explore and deepen their own thinking about and relationship with media (Gainer, 2010; Goodman, 2003; Tyner, 1998).

Traditionally, college students who learn to create various forms of media are in very specialized career paths and majors, such as communications, journalism, or fine arts. Some scholars argue that all students can learn media literacy and media-creation skills, not merely those studying in areas with obvious connections to the media, and that this sort of learning could be made a standard practice in classroom instruction (Burniske, 2008; Daley, 2003; Davidson, 2011; Goodman, 2003; Hobbs, 2011; Masterman, 1985). Some higher-education professors outside of media-oriented fields are beginning to find success with utilizing digital media as alternative communications tools (Abulencia, Vigeant, & Silverstein, 2012, 2013; Greene & Crespi, 2012; Jarvinen, Jarvinen, & Sheehan, 2012; Jenkins, 2008; Juhasz, 2007; Lichter, 2012; Ludlow, 2012; Poe, 2012; Wesch, 2009a).

Overview of the Study

Statement of the Problem

New forms of digital-media communication are emerging. There is a lack of information about effective instructional strategies with which to teach communication using these technologies, particularly within curricula that are not directly related to media and communications. Research is needed to guide educators in aligning instruction with the new forms of digital-media communication.

Purpose of the Study

The purpose of this study was to explore the impact of requiring a video term-paper project and media literacy instruction in a college-level technology course to address the educational goals of increasing student ownership of learning, learning course-related concepts, providing evidence of communication skills, and increasing knowledge of key media literacy concepts. Media literacy is, in large part, a specialized form of critical thinking—a skill universally valued in education (Arke, 2005). Because of this connection with critical thinking, "media literacy can be seen as a means of achieving widely subscribed to academic goals" (Arke & Primack, 2009). However, media literacy extends beyond being a critical media consumer; it involves becoming a media producer as well. Numerous authors recommend expanding the concept of what it means to be literate in a digitally connected world (Burniske, 2008; Daley, 2003; Davidson, 2011; Hobbs, 2011; Masterman, 1985).

Description of the Study

This study used a mixed-method, action-research approach to investigate the impact of the integration of media-literacy instruction into a college-level technology course. Within the tradition of action research, the course professor served as both instructor and participant-observer researcher. Two weeks of a 16-week college undergraduate course in computer networking technology were dedicated to media-literacy instruction.

Research Questions

1. What level of experience with editing and uploading digital video online do undergraduate college students have and what is the nature of that experience?
2. Does learning differ between students who create media while receiving media-literacy instruction and students who receive media-literacy instruction alone without creating any media? If so, how?
3. Do "video term paper" projects and lessons in media literacy improve student engagement and ownership of learning? If so, how?
4. What are the perceptions of students who receive media-literacy instruction and complete a video project in a technology course? Specifically, what do such students report regarding:
    a. interest in learning about the subject?

b. comfort with producing videos?
c. awareness of the video production techniques used in the television, film, and videos that they view?
d. awareness that such instruction and projects are valuable and relevant to their future lives and careers?

Do differences in age, gender, year in college, and subject major affect these students' perceptions?

5. Do "video term papers" produced by students demonstrate evidence of communication skills and of learning course-related content? If so, how?

This study used a quasi-experimental, two-group control/intervention design augmented by data collected solely from the intervention group. Two groups of students received one hour of instruction on media literacy. The control group received no further instruction. The intervention group received an additional two weeks of instruction on media production and work time to develop a 2- to 4-minute video to be posted on YouTube. Pre- and post-assessments of participants' understanding of key media literacy concepts were administered to both groups. At the conclusion of the intervention, those who produced the videos posted on YouTube completed a survey on their perceptions of the impact of the video project on their communication skills, engagement and learning in the course, and comfort with using video production technologies. Structured interviews were conducted with nine volunteers from the intervention group. Finally, a panel of experts assessed the video projects submitted by participants in the intervention group.

Definition of Terms

Action research – a process of inquiry utilized by participant-observer educators involving identification of problems, gathering and analyzing data, and designing a plan of action for the purpose of improving the practice of education (Craig, 2009).

Communication – a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior. (Communication, n.d.)

Critical thinking – Critical thinking is the process of conceptualizing, applying, analyzing, synthesizing, and/or evaluating information as a guide to belief and action. It is based on the intellectual values of clarity, accuracy, precision, consistency, relevance, sound

evidence, good reasons, depth, breadth, and fairness (Foundation for Critical Thinking, n.d.).

Level of experience – the amount of previous exposure and practice a person has with using video-making technologies, such as the number of times previously using video-editing software, the number of videos previously published online, and completion of any previous high-school or college courses that required video production. For the purposes of this research, these levels were defined as: 1) never, 2) 1-2 times, 3) 3-9 times, or 4) 10 or more times.

Media assets – components required to assemble a video project, such as images, video clips, and sound recordings.

Media literacy – the ability to think critically about, and to effectively communicate with, media; the ability to decode, analyze, evaluate, and produce communication in a variety of forms (Tyner, 1998).

Non-traditional age students – for the purposes of this study, non-traditional age students were defined as students who were 25 years of age or older.

Participant observer – a researcher who takes part in all activities in the environment being studied and interacts naturally with subjects in the environment (Craig, 2009).

Remix – to mix and re-record digital multimedia files, such as sound, images, or video, into something new. (Lessig, 2008)

Storyboard – a sequence of drawings that show the scenes that are planned for a video or film production.

Student engagement – the connection and enjoyment a student feels with being involved in a course as demonstrated by actively learning the material and participating in course activities. (Ludlow, 2012).

Traditional age students – for the purposes of this study, traditional age students were defined as students between the ages of 18 and 24.

Video term paper – a student research assignment similar to a written term paper that uses a form of "writing" with digital video technology (Avery, 2007), expanding traditional notions of literacy beyond printed literacy. (An original term coined by the researcher).

Video production – using the digital software and hardware tools and techniques required for creating and publishing an edited video piece in an online context for others to see. Such

usage may include rearranging scene length and order, adding music or audio sound effects, and adding text or titles as needed.

Significance of the Study

This study was important because it investigated the impact of including media-literacy instruction and a media-production project in a college-level technology course. Media literacy education in the United States lags that of many developed countries (Arke & Primack, 2009; Avery, 2007), but it is increasingly relevant to those who work and live in a digitally connected world. New insights that were gained as a result of this study could inspire others to include media-literacy instruction and media projects in technology or other contexts not traditionally associated with developing communication skills.

Limitations of the Study

This study was conducted in a college-level technology class located on a small branch campus associated with a large, mid-western land-grant research university. In many respects, the learning environment of this branch campus resembles that of a small, private college. The branch campus is well connected with the large research university, having many of the same resources available to students doing research. Although the study utilized a mixed-methods approach, it was primarily qualitative in nature. Qualitative research does not typically seek to generalize findings to larger populations. The small sample size used suggests that any quantitative findings were difficult to generalize beyond the local context. Therefore, the results of this study represent what was learned within a single college-level technology course taught on a small campus using a convenience sample.

Assumptions

1) Students involved in the study answered interview questions honestly.

2) Students made an honest effort when taking the pre- and post-tests of media literacy.

3) Students involved felt comfortable and at ease, understanding that participation in the study would not impact their grades or standing in the course.

4) The researcher successfully managed the dual role of conducting the research and simultaneously teaching the course.

About the Researcher

Researcher bias is always an issue in action research; therefore, a brief description of the researcher is necessary to disclose any biases that may be present. The researcher is a tenured faculty member in the Engineering Technology department on the campus where this research took place. He is mid-career, having more than a decade of teaching experience in higher education. Prior to that, he had many years of various industry experiences related to computer technology.

The researcher has a keen interest in understanding the impact of technology on society. He believes, as Kevin Kelly suggests in *What Technology Wants* (Kelly, 2010), that technology generally has a net positive benefit to humanity. However, he also believes that it has some very concerning attributes, as noted by Sherry Turkle in *Alone Together: Why We Expect More from Technology and Less from Each Other* (Turkle, 2011). He believes that students should be taught to understand the technology that they use, particularly the various forms of media that they consume. In short, the researcher strives to maintain a balanced attitude towards the adoption and use of technology, being neither dismissive nor utopian. Of primary interest to the researcher was the current use of digital-media tools for the empowerment and creative expression of people who previously did not have access to such tools and opportunities for expression.

Chapter 2 - Review of Literature

Written Literacy

Writing has long been viewed as a powerful pathway to learning. As William Zinsser (1988) suggests:

> Writing organizes and clarifies our thoughts. Writing is how we think our way into a subject and make it our own. Writing enables us to find out what we know — and what we don't know — about whatever we're trying to learn. (p. 16)

To Zinsser, writing and learning are deeply intertwined. Furthermore, he argues, "the teaching of writing should no longer be left just to English teachers but should be made an organic part of every subject" (Zinsser, 1988, p. 12), a perspective shared by other researchers.

> Writing across the curriculum is a means to connect writing to learning in all content areas. Writing is the process through which students think on paper, explore ideas, raise questions, attempt solutions, uncover processes, build and defend arguments, brainstorm, introspect, and figure out what is going on (Lester, Bertram, Erickson, Lee, Tchako, Wiggins & Wilson, 2003, p. 7).

Banta & Maharaj-Boggs (1997) state that writing "constitutes a complementary and powerful path to cognition vis a vis the standard derivation/problem solving exercises common in engineering and science courses" (p. 1564).

The implementation of this perspective on writing and literacy in higher education can vary according to discipline, academic unit, and even individual professors. The academic unit in which this research took place utilizes the Accreditation Board for Engineering and Technology (ABET) as the accrediting body for several of the engineering technology degree programs offered. ABET (Accreditation Board for Engineering and Technology, 2013) provides a comprehensive list of student learning outcomes that are to be met within accredited engineering technology programs. Although most ABET student-learning outcomes pertain to scientific and technological knowledge, some of the outcomes are related to the acquisition of a broad-based general education that emphasizes skills for success in career and society. Among these broader outcomes are "An ability to communicate effectively with a range of audiences" and "An ability to analyze the local and global impact of computing on individuals, organizations, and society" (Accreditation Board for Engineering and Technology, 2013).

Communication and other interpersonal skills can often make or break the career of an engineer. J. Ben O'Neal (1990) notes that "most engineers are limited in their career not by a lack of technical knowledge, but by an inability to reason verbally, communicate their ideas to others, and furnish leadership" (p. 32). Written communication is a skill that is recognized as important by the field of engineering but is traditionally taught by writing faculty instead of directly within engineering courses and curricula (Gunnink & Bernhardt, 2002).

One approach to integrating writing skills with subject matter acquisition has been the encouragement of "writing across the curriculum" (WAC) initiatives that sometimes involve interdisciplinary collaborations or team teaching using both writing and individual subject experts as teachers (Dugan & Polanski, 2006). While such writing initiatives have been widely encouraged through training and professional development, actual use within college technology courses is not widespread (Dansdill, Hoffman, & Herscovici, 2008). In a survey conducted in 2008, Dansdill et al. found that 94% of the computer science educator respondents believe writing is an important part of computer science education but fewer than half include writing assignments as a regular part of their teaching. Garvey (2010) suggests that much of the difficulty may arise from some technology educators feeling inadequate or unqualified to teach in this area and others lacking interest or the willingness to dedicate course time towards this. Availability of time during a course semester is also a concern. As Dansdill et al. (2008) suggest, it may be that "most faculty in most departments may simply revert to prevailing departmental culture and practice, particularly when faced with large classes, or diverse preparations, or the need to cover different skill areas" (p. 32).

Benefits of Undergraduate Research

Lopatto (2006) suggests there are numerous benefits of undergraduates performing research, including high rates of "learning a topic in depth," "developing a continuing relationship with a faculty member," "understanding the research process in your field," and "readiness for more demanding research" (p. 24), as well as more sophisticated thinking and committed learning. Doing research is not only preparation for graduate school but also a central part of the undergraduate experience. "The ability to develop a nuanced thesis, to seek out supporting materials, and to organize these into a coherent research paper are not simply the

tools of graduate research; they are the essential abilities developed through a good liberal education" (Chapman, 2003, p. 10).

When undergraduate student research is performed, the end result is often a written paper having an anticipated audience of one—the professor who gave the assignment. Chapman describes an example of sharing student research in a public student showcase instead of leaving research papers unclaimed at the end of a semester after having been read only by the professor. In the showcase, students were expected to make oral presentations of their work and take ownership of their learning. "Their oral presentations are given with a seriousness that often belies their years and experience. In one sense, these exercises are pretenses. But they are absolutely essential for the internal transformation that takes place as a student begins to understand what it means to be a scholar and a researcher" (Chapman, 2003, p. 11). Although Chapman's students' oral presentations might be "pretenses," the Internet now makes it possible for students to publish authentic work to a much larger audience.

While not an example of writing or doing research at the undergraduate level, Connecticut middle school teacher Paul Bogush (2008) introduced blogging to his social studies students. Bogush reported noticing a profound effect on student engagement as they realized that they were writing not just for a teacher but also for a potentially global audience. When Bogush asked his students how writing for a worldwide audience through blogging had changed the way they write, they offered responses such as "It has made me think about what I write before I write it because everyone can see it" and "It has enabled me to be able to write, making sure that anyone who reads it, will be able to understand what I am saying" (Bogush, 2008, p. n/a).

One example of undergraduate research published in an online digital-media format comes from the Biovisions group at Harvard University. Each summer, a small group of undergraduate students doing research in the biological sciences produces animations based upon their work in the laboratory (Student Animations, 2013). According to director Robert Lue, Biovisions creates high-end videos for the sciences using digital tools developed in Hollywood and previously available only to people like George Lucas (Lue quoted in Lambert, 2013).

Student research projects may also be beneficial to brain development, health, and growth. The brain develops best in what Eric Jensen describes as enriched environments that include novel, challenging, authentic, and relevant learning that actively involves the learner (Jensen, 2008). Ideally, student research projects can establish these enriched environments of

learning in which students are not passive learners but active participants in gathering, organizing, synthesizing, and creating knowledge. Because undergraduate student research typically pertains to self-selected topics of interest, well-designed student research projects, particularly those that are shared beyond the classroom, may be ideal for creating an enriched learning environment because of the authenticity and relevance of the work being done.

Expanding the Concept of Literacy

> Hollywood film director Martin Scorsese describes how visual media have evolved: When I was in grade school, there was no attempt at teaching any kind of visual literacy. Today, our society and our world are saturated with visual stimulation. The visual image has taken over, in a sense, for better or for worse. But the reality is that if one wants to reach younger people at an earlier age to shape their minds in a critical way, you really need to know how ideas and emotions are expressed visually. Now, that visual form can be video or film, but it still has the same rules, the same vocabulary, the same grammar… You have to make room for film in curriculum… Young people have to know that this way of communicating is a very, very powerful tool (Scorsese quoted in Cruikshank, 2013, p. n/a).

Similarly, George Lucas, creator of the Star Wars series of movies, notes:

> Most kids relate to each other through music or graphics. They are regularly bombarded with images and sound. Most of their awareness comes through the language of moving images and cinema. That's why it's so important that they learn the language of it (Lucas quoted in Daly, 2004, p. n/a).

In a 2003 *Educause Review* article, Elizabeth Daley, Dean of the School of Cinema-Television at the University of Southern California, asserts that the language of the multimedia screen has become the new vernacular, noting that the screens of televisions and computers are what most people in our culture use to obtain information and entertainment. She observes that the language of the screen is "capable of constructing complex meanings independent of text" and "enables modes of thought, ways of communicating and conducting research, and methods of publication and teaching that are essentially different from those of text" (pp. 33-34). While Daley (2003) argues that the language of the screen is different than text, Scorsese describes

visual communication with video or film using terms such as *vocabulary* and *grammar* that are traditionally linked with words and printed texts (Scorsese quoted in Cruikshank, 2013, p. n/a).

Media scholars are reimagining what it means to be literate and what qualifies as a text. According to Renee Hobbs, "a text doesn't have to be written. A pop song is a text. So is a movie. Text can be defined as symbolic expressions created by humans to share meaning" (Hobbs, 2011, pp. 22-23). Daley suggests, "those who are truly literate in the twenty-first century will be those who learn to both read and write the multimedia language of the screen" (2003, p. 34). George Lucas agrees: "Learning how to communicate with graphics, with music, with cinema, is just as important as communicating with words. Understanding these rules is as important as learning how to make a sentence work" (Lucas quoted in Daly, 2004, p. n/a).

Lucas also notes, "We have built up hierarchies and prejudices against various forms of communication that make them less important in the educational system, and as a result, kids have to learn many of their communication skills on their own" (Lucas, quoted in Monaghan, 2006, p. A33). The typical experience for many young people is still working primarily with printed texts at school. After school they immerse themselves in digital media, continuing to engage in informal learning (Prensky, 2006; Tapscott, 1998). Prensky (2006) refers to this phenomenon as *bifurcation of learning*, with the school part of learning being accomplished in analog, text-oriented ways and the outside-of-school part of learning being accomplished in digital contexts. Various forms of media are competing with family and school to be the main teacher and storyteller in the lives of young people (Goodman, 2003; Smith, Christoffersen, Davidson, & Herzog, 2011).

Integrating Technology in the Classroom

Tyner (1998) argues that technology use in education should be linked to the core curriculum and authentically assessed. O'Brien & Scharber (2008) state that:

> Some tech enthusiasts might be tempted to import into school the most enjoyable aspects of young people's social worlds and pleasures gained from creating and using digital literacies. This desire should be tempered with the understanding that the use of digital technologies in schools should be driven by educational purposes rather than social ones (p. 67).

Paul Bogush, a middle school teacher in Connecticut, agrees

> I don't use technology in my class because it's cool. I don't create projects around a certain type of 2.0 tool. I don't look at my toolbox before I start designing a lesson. I don't use it to motivate or teach the kids. I don't use it to make my units more exciting or engaging. The design of my units makes the use of technology necessary... Every unit should have a reason why technology should have to be used to meet the goals and objectives of the lesson, otherwise our kids' is [sic] learning is dictated by the tools we give them (Bogush, 2009, p. n/a).

Finally, elementary school teacher Kathy Cassidy, in Saskatchewan, Canada, echoes Bogush's sentiment with a critique of what she refers to as the "digital worksheet" approach to technology.

> Technology should not be used as simply a digital worksheet. There are many apps and Internet sites available that are simply a technological version of a paper task, forcing students to practice over and over a skill that they may already have mastered...students should spend most of their time using technology for more creative purposes (Cassidy, 2012, p. n/a).

Using Film and Video as Aids to Instruction

The use of motion pictures in educational settings has nearly a century-long history that has been reviewed by Snelson & Perkins (2009). From silent reels of the early 20th century to film projectors with sound to videocassette tapes and, most recently, to online digital videos, the motion picture has been a staple of instruction almost from its introduction (Snelson & Perkins, 2009). Movies communicate in ways that still photos and textual accounts cannot. Historically, some common instructional uses of motion pictures include demonstrations or process overviews, time alteration with slow-motion or high-speed playback, viewing of dangerous or distant locations, and dramatizations or performances (Snelson & Perkins, 2009).

An early and innovative use of digital video technology involved training school psychologists on interviewing techniques through interactive videos that included written transcripts and a student commenting system (Hansen, 1990). In one study of pre-service teachers, the effectiveness of video editing for reflections on teaching practice was examined (Calandra & Brantley-Dias, 2010). Viewing YouTube videos was an effective supplement to text-based readings in a recent computer-science course for non-majors (Chtouki, Harroud, Khalidi, & Bennani, 2012). According to Jennifer Hillner (2012), many instructors for students

at all age levels are using YouTube for teaching. Although YouTube contains some content inappropriate for young viewers, it also contains age appropriate material that can be safely accessed.

These examples illustrate the versatility of video as a teaching and communications medium, supporting Daley's (2003) notion that visual multimedia can communicate powerfully in ways different from the static page. However, the integration of video and motion pictures into the classroom is not without its skeptics. While studies in specific contexts suggest that learning benefits of the practice exist, Snelson & Perkins (2009) report that decades of research about the effects of moving pictures in the classroom remain inconclusive, due to difficulties in fully isolating the medium as an independent variable.

New Media, New Literacies

While exploring an ever-expanding concept of "literacy" for this literature review, the researcher encountered many related terms and definitions. Terms such as information literacy, digital literacy, computer literacy, technology literacy, video literacy, visual literacy, and even programming literacy seemed to have relevance to the discussion. A naturally occurring convergence of technologies, the condition in which previously distinct systems merge toward doing the same task (Jenkins, 2001), seems to be making many of the distinctions among the various literacies less relevant. For example, the technologies of telephone and television were once completely separate and distinct from each other. Through digitization, these two technologies can now be delivered via a single medium of digital binary packets. They have converged (Jenkins, 2001). Because of digital media, the lines between the technologies are blurring and, in turn, between the various forms of literacy. For the purposes of this study, the term media literacy was utilized as a catch-all phrase that describes each of the various forms of new literacy skills under a single umbrella—bearing in mind that each of the new literacy forms is duly noted as important and relevant.

Media Literacy Defined

What exactly then is media literacy? The most frequently cited definition is that devised by the Aspen Institute in 1993 and still widely used in the literature: having an ability to access, analyze, evaluate, and create media in a variety of forms (Aufderheide, 1993). Scholars have attempted to expand upon exactly what media literacy entails. Richard W. Burniske, author of

Literacy in the Digital Age, offers that "media literacy is the ability to read and understand a communications medium by looking through the processes it enables, interpreting its signs and symbols, while also looking at the medium's effect on an author, audience and message" (Burniske, 2008, p. 11). For Burniske, the essence of media literacy is having the ability to examine and understand the language of media and recognize the implications of this understanding. This media language is sometimes known as the *language of the screen* (Daley, 2003, p. 33).

Framework of Media Literacy

Over time, a comprehensive framework of media literacy has emerged that identifies its key components (Aufderheide, 1993; Hobbs, 2011; Thoman & Jolls, 2003). According to the framework, media literacy is critical thinking about, responding to, and creating various forms of media. Renee Hobbs (2011) identifies the key components as:

1. Access - Finding and sharing appropriate and relevant information using media texts and technology well
2. Analyze - Using critical thinking to analyze message purpose and meaning
3. Create - Composing or generating media content
4. Reflect - Considering the impact of media messages and technology tools on our thinking and actions
5. Act - Working individually or collaboratively to share knowledge and solve problems (p. 12)

Thoman and Jolls (2003) suggest that this media-literacy framework is derived from five core assumptions about the nature of media:

1. All media messages are "constructed."
2. Media messages are constructed using a creative language with its own rules.
3. Different people experience the same media message differently.
4. Media have embedded values and points of view.
5. Most media messages are organized to gain profit and/or power. (p. 37)

These assumptions can be restated as the five critical questions a media literate person should ask. These questions are:

1. Who created this message?
2. What creative techniques are used to attract and hold my attention?
3. How might different people understand this message differently from me?
4. What lifestyles, values, and points of view are represented in or omitted from this message?
5. Why was this message sent? (Thoman & Jolls, 2003, p. 37)

Previous Measures of Media Literacy

Hobbs & Frost (2003) investigated media literacy among American 11th-grade high-school students. The instrument consisted of a series of open-ended questions as well as checklist-style questions related to the five critical questions of media literacy (Aufderheide, 1993; Thoman & Jolls, 2003). Student written responses to the open-ended questions about print, radio, and television media were analyzed and coded. To enhance scoring precision, checklist questions for identifying message purpose and target audience were included to produce consistent results. Inter-rater reliability of the instrument response coding was measured with Cronbach's alpha, with scores ranging from 0.89 to 0.93.

Arke & Primack (2009) explored the relationship between critical thinking and media literacy skills among college students using a theoretical framework based on the key questions of media literacy (Aufderheide, 1993; Thoman & Jolls, 2003) and Bloom's taxonomy of learning (Bloom, Hastings, & Madaus, 1971). Student participants provided open-ended answers to short essay-style questions that were converted to numeric scores in a process guided by the work of Worsnop (1996). Internal consistency/reliability of the Arke & Primack (2009) instrument was measured using Cronbach's alpha, with values for radio, TV, and print media questions calculated at 0.74, 0.79, and 0.75 respectively. The Cronbach's alpha for the combined total score was 0.90. Construct validity for the instrument used in Arke & Primack's study (2009) was examined by measuring the correlation between student scores of media literacy and student scores of critical thinking obtained from the commercially available California Critical Thinking Skills Test (Insight Assessment, 2003). The correlation ($r = 0.32$, $p = .03$) was sizeable and statistically significant.

Ashley, Lyden & Fasbinder (2012) investigated media literacy of college freshmen at a mid-western U.S. university. Researchers in that study developed an instrument using open-ended questions based upon the key questions of media literacy (Aufderheide, 1993; Thoman &

Jolls, 2003) with links to Arke & Primack's (2009) framework and Bloom's Taxonomy (Bloom et al., 1971). Researchers in that study followed an iterative coding process using a grounded theory approach. They grouped student responses into meaningful categories that described orientations to modes of thinking. The orientations highlight different types of meanings that the students constructed in response to the open questions. Three outside scholars reviewed the categories and labels to establish consensus. For example, with the question about the message sender of an Old Spice television commercial, the researchers grouped student responses into such categories as: *Brand Orientation* for answers that stated the Old Spice company or brand was the sender; *Actor Orientation* for answers suggesting that the actor speaking in the commercial was the sender; and *Combined Orientation* for answers that said both the actor in the commercial and the Old Spice company were the media message senders. Students of Ashley et al. (2012) were best able to ascertain the sender, purpose, and meaning of advertising messages, but they were less able to identify the same information about news broadcasts or public-relations messages.

Paradigms of Teaching Media Literacy

There are three distinct—and sometimes overlapping—paradigmatic approaches associated with the teaching of media literacy (Schmidt, 2010). The first approach, known as the inoculatory/protectionist perspective, is focused on preventing bad media from influencing youth. Within this perspective, there are good art and bad art; it is the duty of those being inoculated to embrace the good and to avoid the bad. *Cultural Literacy: What Every American Should Know* is a typical example of what constitutes good art (Hirsch, 1987). According to Masterman (1985), one of the earliest instances of the inoculatory/protectionist perspective is exemplified in Leavis and Thompson's book entitled *Culture and Environment*, which issued a call to resist the corrupting forces of the mass media. Leavis and Thompson (1950) wrote, "We cannot, as we might in a healthy state of culture, leave the citizen to be formed unconsciously by his environment; if anything like a worthy idea of satisfactory living is to be saved, he must be trained to discriminate and to resist" (Leavis & Thompson, p. 5) the harmful influence of mass media.

While the desire to protect children is understandable, blanket policies that restrict access to new media forms may block access to the good as well as the bad (Boss, 2008). According to

Schmidt (2010), the inoculatory/protectionist model of media education continues to be promoted in certain programs today, because some educators feel that any impact that media has on individual attitudes, thoughts, or behaviors is validation for assuming a protectionist stance. However, Scheibe & Rogow (2012) write:

> It does not make pedagogical sense to approach education from the perspective of protecting children from harmful content; educators don't teach children to read in order to protect them from bad books, and though we recall days of junior library cards and locked stacks that kept adult materials away from children, we have never encountered a teacher who taught lessons about "book safety." Those types of protectionist strategies cannot work to make students skilled readers of books, and they will not produce skilled readers of other media. (p. 2-3)

In the late 1960s and early 1970s, two other approaches to media literacy emerged. The popular-arts approach "took shape around the central idea that popular culture/art could be just as authentic as high culture/art" (Schmidt, 2010, p. 66) and that the culture is a product of society, not solely a product of the elite. Within the popular-arts approach, instead of categorizing certain media forms (such as television or film) as bad, it became important to distinguish between the bad and good within the popular media (Schmidt, 2010). Although for-profit, commercial television would still be considered a bad art form, nonprofit, educational public television could now be considered a good form of media (Schmidt, 2010). The most recent development in media-literacy education, the critical/representational/semiological approach, focuses on "critical cultural questions of ideology" and suggests "students should learn of their role as an active participant in the mediated message meaning making process" (Schmidt, 2010, p. 70). While there is some overlap among the three approaches that cannot be dismissed, the third perspective, the critical/representational/semiological approach, guides this study.

Media Literacy Education

Technological Fluency of College Students

Today's high school graduates have grown up immersed in digital media. They have never known a time when the Internet and the media-rich World Wide Web did not exist. Sometimes referred to as the net generation (Tapscott, 1998) or digital natives (Prensky, 2001), these students are often thought to be technologically fluent because of their affinity for using

various forms of digital technologies. The following section examines how media-literacy instruction and video projects are used in higher education.

Based on the assumption that college students use the technology they own, college students frequently use digital technology, with 89% of students in the United States owning laptop computers and 77% owning mobile smartphones (Dahlstrom, Walker, & Dziuban, 2013). Looking more specifically at the software tools used, a 2005 Educause study of 18,000 college students from 63 institutions of higher learning in the United States (Kvavik & Caruso, 2005) showed that 99% of the respondents reported being users of e-mail and Web browsers. Comparing this with students' reported use of other software tools, 65% were slideshow presentation software users and 48% were graphics-editing software users. Twenty-five percent had made Web pages and 24% had used video- or audio-editing software. In a 2008 survey of 1,973 Australian undergraduate students, representing 25.3% of the first-year students at the University of Melbourne (Kennedy, Judd, Churchward, Gray, & Krause, 2008), 50% had never created a Web page and 53% had not edited a video with computer software. However, 84% reported using graphics-editing software, 89% had used slideshow presentation software, and 99.5% had used word-processing software. The literature suggests that the more complex and specialized the software tools are, the less likely it is to be used (Kennedy et al., 2008; Kvavik & Caruso, 2005; Schmidt, 2010).

When the college students in the 2005 Educause study were asked about their reasons for learning particular technologies, the most frequently cited reason was a class or major requirement (Kvavik & Caruso, 2005). For example, 41% of 18- and 19-year-olds and 49% of 20- to 24-year-olds gave this reason for learning spreadsheet software; for learning slide-presentation software, 47% of the 18- and 19-year-olds and 56% of those aged 20 to 24 gave this reason. However, by comparison, only 7% of 18- and 19-year-olds and 10% of 20- to 24-year-olds reported having a class or major requirement motivating them to learn the more specialized category of graphics software applications (Kvavik & Caruso, 2005). As the software tools became more specialized, such as those used for graphics or video editing, personal interest became the more prevalent reason for learning the tool than did a requirement to learn it in a class or major. Interestingly, college students tend to use the tools learned because of personal interests much less often than tools required by the curriculum, suggesting a strong influence of major and course requirement on learning technology tools (Kvavik & Caruso, 2005

Schmidt (2010) conducted a smaller study of digital technological use by undergraduates at a metropolitan university in Pennsylvania. Schmidt used written surveys to collect data from 409 undergraduate students who had completed at least one college class, representing approximately 4% of the undergraduate population at that institution. In addition, he conducted qualitative interviews about the faculty members' perception of the media-creation skills of their students. Sixteen faculty members teaching in the departments of education, communications, and English were interviewed. As a result of that study, Schmidt (2010) notes that students are more likely to complete media projects in middle or high school than during their college-education experience. Schmidt also reports that "student involvement in media creation is very limited, and that students are incompetent in at least certain dimensions of media creation" (Schmidt, 2010, p. 132).

Use of Technology and the Curiosity Gap

Technological advances with mobile computing allow young adults to have unlimited, always-on access to the Internet. We live in a time in human history with the greatest access to the world's knowledge, but empirical studies suggest that the typical college student's use of technology is of a somewhat limited scope—mainly focused on connecting with friends and being entertained through consuming media (Lenhart, Madden, Macgill, Manager, & Smith, 2007; Madden, 2007; Schmidt, 2010). While some young people are doing amazing things with technology (Ito et al., 2010), there seems to be a great disparity between what is technologically possible (as used by a few) and what is actually accomplished through technology (as used by most). Michael Wesch describes this disparity as a "curiosity gap," suggesting an environment in which those who are curious in a world of readily available information can race far ahead of those who are not (Wesch quoted in Waters, 2011). The challenge to today's college educator is finding ways to span this curiosity gap by connecting the information-rich environment to relevant questions in ways that are compelling to college students. At first glance, an apparent solution to the problem might be to include more tech-oriented assignments, such as video projects, in college teaching in hopes of engaging young people with a familiar technological environment. However, this approach is often problematic. As Wesch notes, "The surprising-to-most-people-fact is that students would prefer less technology in the classroom (especially

participatory technologies that force them to do something other than sit back and memorize material for a regurgitation exercise)" (Wesch, 2009b, p. n/a).

Simply adding technology in instruction and expecting it to engage students with learning does not work, based on early research. Nearly 30% of the 17,800 students in the 2005 Educause study reported that they preferred to have limited or no technology integrated into the courses they take (Kvavik & Caruso, 2005). The curiosity gap is likely related to issues such as student epistemological development (Belenky, Clinchy, & Goldberger, 1997; Perry, 1970), their perceptions of its relevance, and even—perhaps surprisingly to some—a lack of technological know-how. Attitudes towards the relevance and utility of technology skills improve as students mature or gain experience in the workforce (Kvavik & Caruso, 2005).

Media Literacy of Undergraduate Students

In a recent study of the media literacy of undergraduate students of non-communications majors at a large mid-western university, researchers found that the 99 student participants were "poorly versed in analyzing and understanding a variety of media messages" (Ashley et al., 2012). Using instruments based on the key questions of media literacy (Thoman & Jolls, 2003), Ashley et al. (2012) found that the students were better able to ascertain the sender, purpose, and meaning of advertising messages than about news broadcasts or public-relations messages. At all levels of education in the United States, media-literacy education lags the initiatives that teach students about the media and its messages in many other countries (Arke & Primack, 2009). Canada, Australia, and United Kingdom have mandatory media-literacy curricula; other countries, such as Russia, Austria, South Africa, Japan, Israel, and Italy, are expanding their efforts at teaching media literacy (Scheibe & Rogow, 2012).

Media-literacy education appears to be integrated into some higher-education academic majors and there is variation within these majors with regard to any expectation of students creating media. According to Schmidt (2010), there are four areas of study that commonly address media literacy: Communications, Mass Media, English, and Education. Of these, Mass Media is the degree program that finds media literacy central to its purpose. Media-literacy topics having potential for general education appeal are often found within the mass-media program curricula, but typically "only majors are exposed to a systematic program of study that exposes them to both media production and criticism skills" (Schmidt, 2010, p. 53). Other degree

programs contain important elements but fall short of what media scholars might recognize as a complete education in media literacy. Communications or speech degree programs "frequently neglect the consideration of media, and focus on rhetorical, interpersonal, or group applications of communication theory" (Schmidt, 2010, p. 53). As a required subject for all college students, English is "well positioned" to help with attaining college-level critical media literacy, but it "largely neglects the media creation dimension of media literacy" (Schmidt, 2010, p. 53-54). Additionally, pre-service teacher-education programs often include instruction on using media technologies as tools for teaching but do not include components of media criticism or even creating media (Schmidt, 2010).

Benefits of Media Production

Goodman (2003) argues that one of the most effective ways of teaching critical media literacy is through the use of student-created media. However, little is known about the actual impact of learning to produce media upon having an ability to understand and critically analyze similar forms of media produced by others. Renee Hobbs (1998) suggested that the role of media creation was one of seven great debates among media-literacy scholars. However, most of these scholars hold that media production is an essential component of a complete media-literacy education, as demonstrated by the inclusion of "create" within the media-literacy framework.

Creating a work of media engages students in a number of ways. Through creating media, students can begin to understand the multiple layers of information that make up the television or videos they watch and the magazines or websites that they read. They can see for themselves how words can be deleted or added to sentences and made to seem as if they had originally been spoken that way; how causes and effects can be made into their opposite; and how perceptions of time, space, power, and history can all be altered without seeming to be (Gainer, 2010). Students can understand how "the media acts as a frame and a filter on the world while appearing to be a clear window" (Goodman, 2003, p. 6). Media production is multimodal, involving the expression of multiple intelligences, and may have broader appeal to more students than does traditional writing. "Since media messages are transmitted through so many different mental processes, the combination of analysis with production also incorporates multiple intelligences in the learning process (linguistic/verbal, logical/mathematical, musical/rhythmic, visual/spatial, body/kinesthetic, intrapersonal and interpersonal)" (Thoman & Jolls, 2003, p. 21).

Student-Created Video Projects

Since the early 1990s digital video-making technologies have become increasingly available (Rubin, 2000), but the dearth of literature related to student-made digital-video projects at the college level (Hofer & Swan, 2005) suggests that most areas of higher education have been slow to adopt digital technology as a valid communications medium. If students have educational experience with creating digital video at all, Schmidt (2010) found that they were more likely to experience video-making projects while in high school than when taking college courses. Schmidt's survey of 409 non-media major undergraduate students at a metropolitan university in Pennsylvania found that 53% of student participants completed a video-creation assignment in high school, but only 29% of the same students reported doing a video-creation assignment in college (Schmidt, 2010).

More recently, student-made video projects have been implemented in college courses in the fields of chemical engineering, chemistry, business, history, neuroscience, and education, using various approaches and project goals (Calandra & Brantley-Dias, 2010; Greene & Crespi, 2012; Jarvinen et al., 2012; Lichter, 2012; Ludlow, 2012; Poe, 2012). The students involved in these projects tend to enjoy and become engaged with completing these digital-video projects, often recommending them for future classes. However, it is also common for some students to initially resist doing such projects, largely due to a lack of prior experience and skills with using this form of technology (Greene & Crespi, 2012; Jarvinen, et al., 2012). With adequate supports in place, initial attitudes of student skepticism can often shift to surprise and a sense of accomplishment in having learned a new skill (Jarvinen et al., 2012). Some researchers exploring college-level digital-video projects have expressed surprise at students' lack of technical abilities with digital filmmaking (Greene & Crespi, 2012).

Video Assignment Examples and Attributes

In a review of the literature on video assignments, the duration of the video-project assignments ranged from two weeks (Greene & Crespi, 2012) to an entire semester (Ludlow, 2012; Calandra & Brantley-Dias, 2010), with a duration of approximately five weeks being a common time for completing a video assignment (Lichter, 2012; Jarvinen, et al., 2012). Another varying aspect of these projects was the amount of in-class time that was allocated. While several projects included in-class instruction on making videos or offered outside-of-class tutoring and

tech support, another offered no in-class time or out-of-class support, leaving it to the students themselves to acquire the technical skills needed (Greene & Crespi, 2012). Each of the class projects reviewed emphasized communications skills; some connected the project to student professional development and future careers (Ludlow, 2012; Poe, 2012; Greene & Crespi, 2012; Calandra & Brantley-Dias, 2010). "With the ease and availability of video recorders and platforms such as YouTube, visual communication using small videos is becoming more prevalent. More practicing professionals will be expected to develop short informational videos to share concepts, document operations and train coworkers" (Ludlow, 2012, p. 1).

Video Projects in a College-Level Advertising Course

Greene & Crespi (2012) describe using student-made video projects in a college advertising course. This study assigned a video project, followed by the collection of survey data to measure student perspectives at the conclusion of the project. Seventy-three students worked in small groups (two to five members) on creating an advertising video. The students were given the last two weeks of a semester to develop, outside of regular class meeting times, a video product advertisement to be screened on the last day of class. No support or instruction was provided for the technical aspects of making a video. The student survey results were generally positive towards the video project, but not strongly so. The survey used a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The mean rating for the "video project as an important exercise" was 4.59, "as a useful experience" was 4.67, and the "most useful project in the class" as 4.15. "Enhancing learning in the class" received a mean score of 4.75. Stronger support was for the video project being an "enjoyable experience," with a score of 5.01, and an "interesting experience," scoring 5.08. The only question receiving a slightly negative score (3.84) was the video project being "helpful in a future career." A number of comments provided in the student survey feedback indicated student frustration with a lack of knowledge or equipment to do the assignment. It should be noted that Greene & Crespi (2012) reported a bimodal distribution of responses with few individual scores in the middle; most were either strongly positive or strongly negative. However, only the mean scores were reported without standard deviations. The study did not include any details about the quality of the video content created. Greene & Crespi (2012 also noted that the students generally failed to connect the experience of video production to their future careers in business.

Video Projects in an Introductory Chemistry Course

Lichter (2012) describes a case study investigating the use of digital video as a supplemental aid to learning in a college-level introductory chemistry class. Students in this large-lecture course (n = 181) were given the opportunity to create a YouTube video on 'solubility rules' for optional extra credit. Twenty-seven percent of the class (n = 48) opted to work in small groups to create a video project.

To measure learning outcomes related to the solubility rules, exam questions of medium difficulty level were included on a mid-term and subsequent final examination. Students who participated in making videos on the solubility rules outperformed students who did not on questions specific to the solubility rules on both the mid-term and final exams, suggesting that making videos about a given topic can aid student learning. In doing the extra-credit video project, these students reported having to break the subject down into its component parts, thereby improving their understanding of the topic. Interestingly, students who viewed the videos made by classmates but did not themselves make a video outperformed students who neither made nor viewed videos on the exam questions specific to solubility rules. This suggests a potential peer-instruction effect that occurs when students view videos made by other students.

Survey data collected indicated that students used the textbook more often than the videos for studying, and they used the lecture notes and videos for studying with about the same frequency (Lichter, 2012). However, the students affirmed that the videos made studying the topic (of solubility rules) easier and that including the video project made the course more enjoyable. The students who made the videos generally agreed that making the video helped with preparing for the exam and, to a lesser degree, that the project increased their interest in general chemistry.

Video Projects in a Neuroscience Course

A recent study by Jarvinen et al. (2012) at a small liberal-arts college in the northeastern United States examined the use of video projects in a neuroscience course. Two sections of an undergraduate course on neuroscience were given a video creation project in which one section (n = 29) was assigned the topic of the "scientific method," while the other section (n = 27) was assigned "neurotransmission." In total, there were 56 traditional-age sophomore student participants in the study (46 women and 10 men) representing majors in biology, chemistry, philosophy, and psychology. Students in the course were to work individually to make a 3- to 5-

minute video containing simple text, a song, and multiple graphics, using freely available Microsoft Windows Moviemaker or Apple iMovie video-editing software. The project lasted approximately five weeks. Most of the video-making efforts occurred outside of the regular class time. An out-of-class tutorial session was provided for using the video-editing software, and students were encouraged to consult with the professor for additional guidance when needed (Jarvinen et al., 2012).

Data collection in the study consisted of a student response paper written at the conclusion of the video assignment as well as a direct measure of learning using questions specific to the topics of "scientific method" and "neurotransmission" embedded in the final exam Participants in this study reported that while the tools and technology needed were easier to use than expected, the project itself took longer than anticipated to complete. As with the chemistry course (Lichter, 2013), students reported experiencing the process of breaking a complex topic down into understandable parts. The authors of this study compared the project as similar to tried-and-true research-paper projects, with the added complexity of linking video and sound (Jarvinen et al., 2012).

In general, students in the neuroscience course reported having little or no experience with video making, despite the fact that more than 98% of them reporting owning a computer with installed video-editing software. In this study, students were assigned a topic with which to work, but the survey revealed that most would have preferred choosing their own topics (scientific method: 66%; neurotransmission: 70%). Both the scientific method and neurotransmission groups agreed that they understood their topic better as a result of the project (scientific method: 93%; neurotransmission: 93%). The direct measure of student learning through the embedded final-exam questions revealed that students who made videos about the scientific method scored higher on questions pertaining to the scientific method (88.6% ± 3.0) than did students in the neurotransmission group (73.3% ± 4.8), while students who made videos about neurotransmission scored higher on the exam questions about neurotransmission (87.9% ± 2.5) than did students in the scientific-method group (76.2% ± 3.7), suggesting that creating a video project about a given topic improves student learning on that topic (Jarvinen et al., 2012).

Video Projects in a Thermodynamics Course

Ludlow (2012) investigated the use of student-made digital-video projects in an undergraduate chemical engineering course on thermodynamics taught in subsequent semesters

of fall 2011 and spring 2012. The stated purpose of assigning the video project was for students "to research, summarize, teach and give a real world example of some concept associated with: the mathematical description of the state of material; the mathematical estimation of thermophysical properties; applications of the first law of thermodynamics, volumetric properties of pure fluids, the thermodynamic properties of fluids; and heat effects of processes" (Ludlow, 2012, p. n/a). Students created the videos in small groups and received little or no instruction on video-production techniques. While the assignment given is described as using a YouTube-style approach to creating the video, Ludlow's students were asked not to actually post videos to YouTube.

Ludlow reported on student perceptions of the video-making project obtained from a short survey administered at the conclusion of the project. The survey focused on three main areas: student interest in doing the video project, viewing of other student-made videos for learning course content, and the impact of completing the video project on learning course content. The survey questions were rated on a Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). The survey results published by Ludlow did not indicate the number of survey respondents or whether or not the reported average scores were a composite of the two semesters under review.

The thermodynamics course had 42 students in the fall 2011 semester and 60 students in the spring 2012 semester. The results of the survey indicated agreement that the video assignment should be continued in future semesters (average score of 3.3), and that watching the videos was enjoyable (average score of 3.1). Ratings related to student learning outcomes were less positive, with a 2.8 average score for having videos of others available as a learning aid and a 2.7 average score for perceived learning from the videos. A question on whether completing the video project helped with learning thermodynamics concepts received a neutral average rating of 2.0. However, in response to a question about doing a research project instead of the video, the students indicated a preference for doing the video over a traditional term paper or research project.

Video in a Media-Studies Course

In an experimental course in media studies entitled "Learning from YouTube" at a small, liberal-arts college in California, Professor Alexandra Juhasz not only required her students to create videos for YouTube, but recorded and published each class session on YouTube. It can be

challenging for college students who have favored written communication throughout their academic careers to make the shift into "writing with video." Juhasz's students, "realized how well trained they actually are to do academic work with the word—their expertise—and how poor is their media-production literacy" (Juhasz quoted in Jenkins, 2008, p. n/a). A common solution to the dilemma is for novice moviemakers to incorporate familiar formats into the new medium. Professor Juhasz observed that her students "ended up inventing or recycling a wide range of methodology for academic research and 'writing'" (Juhasz quoted in Jenkins, 2008, p. n/a). She characterizes these methods as "word-reliant, the illustrated summary, and the YouTube hack," in which academic content takes on forms commonly found on YouTube, such as music videos, how-to videos, or advertisements (quoted in Jenkins, 2008, p. n/a).

Juhasz's word-reliant format appears to be a safe and familiar approach utilized within some other college-student–created videos as well. Students in the neuroscience course (Jarvinen, et al., 2012) also appear to have made videos that were exclusively word-reliant, making text-based slides that were similar in form to a PowerPoint presentation. Some of the students in Ludlow's chemical engineering study followed a similar PowerPoint-style approach that included narration or text-only slides with background music (Ludlow, 2012).

Video Creation, Learning, and Creativity

Poe (2012) argues that students who make successful videos must learn to read texts closely and to think critically. Ludlow (2012) identifies the student-created video project as a reasonable substitute for written research term papers that are traditionally assigned and presented in college courses. Some of the researchers described student video projects as flexible and easily integrated into courses, regardless of academic area, and even suggest that students can learn material from videos made by other students. (Jarvinen et al., 2012; Lichter, 2012). However, perhaps more interesting to educators is the connection between video production and learning. Several of the studies reviewed have linked video production to improved learning of course material (Calandra & Brantley-Dias, 2010; Greene & Crespi, 2012; Jarvinen et al., 2012; Lichter, 2012). Most of the students in these studies who did video projects indicated (via survey) that their learning was enhanced by the experience. However, Hofer & Swan (2005) indicated that video projects can easily become overly focused on technological proficiency, rather than learning and communicating course content.

While creativity is a common theme found in student-made video projects, none of the studies reviewed appeared to explicitly emphasize aesthetics or visual appearance of the videos. One aspect of student video projects that was noticeably missing in this literature review was elements pertaining to media literacy, such as critically examining messages or understanding other points of view. This is somewhat understandable, in that each of the projects emphasized course-related content and provided an opportunity for practice in communicating this content to others.

Summary

Efforts to describe the skills involved in working in the current digital environment introduced terms such as information literacy, digital literacy, computer literacy, technology literacy, video literacy, visual literacy, and even programming literacy. The construct of media literacy seems to be the most encompassing term and has been adopted for this research. Media literacy is defined as having an ability to access, analyze, evaluate, and create media in a variety of forms (Aufderheide, 1993). Hobbs (2011) used this definition to create the five key components of media literacy: access, analyze, create, reflect, and act. Thoman and Jolls (2003) then converted the components into five critical questions used as the framework for an instrument to measure media literacy developed by Hobbs and Frost (2003). More recent instruments to measure media literacy include one that links critical thinking and media literacy (Arke & Primack, 2009) as well as an open-ended questionnaire developed by Ashley et al. (2012). Elements of these instruments were integrated in the instrument developed for this study.

Video-production assignments in higher education seem to be uncommon (Hofer & Swan, 2005), and student experience with producing video is limited (Kennedy et al., 2008; Schmidt, 2010). However, some researchers are beginning to explore the use of student-created video projects outside of traditional media-oriented subjects for various learning purposes (Calandra & Brantley-Dias, 2010; Greene & Crespi, 2012; Jarvinen et al., 2012; Lichter, 2012; Ludlow, 2012; Poe, 2012). Some evidence for learning course-specific content through video projects is beginning to emerge in these studies.

Chapter 3 - Research Methodology

Purpose and Research Questions

The purpose of this study was to explore the impact of requiring a video term-paper project and media literacy instruction in a college-level technology course to address the desired educational goals of increasing student ownership of learning, learning course-related concepts, providing evidence of communication skills, and increasing knowledge of key media literacy concepts. Some scholars propose that integrating media-literacy instruction into various courses is an effective way of addressing these educational goals (Arke & Primack, 2009; Hobbs, 2010); however, little is known about integrating media-literacy instruction in technology courses. The new knowledge gained in this study is of interest to other educators who are considering integrating digital video projects and media literacy education into their courses.

The following research questions were explored:

1. What level of experience with editing and uploading digital video online do undergraduate college students have and what is the nature of that experience?
2. Does learning differ between students who create media while receiving media-literacy instruction and students who receive media-literacy instruction alone without creating any media? If so, how?
3. Do "video term paper" projects and lessons in media literacy improve student engagement and ownership of learning? If so, how?
4. What are the perceptions of students who receive media-literacy instruction and complete a video project in a technology course? Specifically, what do such students report regarding:
    a. interest in learning about the subject?
    b. comfort with producing videos?
    c. awareness of the video production techniques used in the television, film, and videos that they view?
    d. awareness that such instruction and projects are valuable and relevant to their future lives and careers?

    Do differences in age, gender, year in college, and subject major affect these students' perceptions?

5. Do "video term papers" produced by students demonstrate evidence of communication skills and of learning course-related content? If so, how?

Action Research Methodology

The methodology used in this study was rooted in the action research tradition of education and social science research. Dorothy Craig (2009) cites three main reasons for conducting action research: "1) to bring about change and improvements, 2) addressing targeted goals and objectives that are attainable by the researcher, and 3) promoting collaboration and community among research participants which may result in improving conditions and situations for all members of the learning community" (Craig, 2009, p. 6). One difficulty for many practicing educators is the challenge of transforming theoretical educational research into practical uses in the classroom. Action research can serve as a bridge between theoretical and practical knowledge (McIntyre, 2005). It can provide educators with opportunities to do research that can make a difference in their own classrooms, without needing big-budget research methodologies requiring large sample sizes. It is practical research that addresses an immediate, local need while providing opportunities for deep reflection leading to individual professional growth (G. L. Anderson, Herr, & Nihlen, 2007). Action research uses a participant observer studying his or her current environment. The problem addressed in this study—a lack of information about teaching media literacy with digital technologies in a technology-based course—was readily accessible through action research. Action research was utilized in this study because the researcher had a desire to increase what was known about the use of media-literacy projects while teaching technology courses in higher education.

Overview of the Study Methodology

This study used a quasi-experimental, control/intervention design augmented by additional data collected solely from the intervention group. Two groups of students received one hour of instruction on critical medial literacy. The control group received no further instruction. The intervention group received an additional two weeks of instruction and work time to develop a 2- to 4-minute video to be posted on YouTube. Five instruments were used for data collection. Participants in both groups completed a survey that provided demographic information as well as self-reported experience with video production (SVE) as well as pre- and post-assessments of participants' understanding of key media-literacy concepts (TAVV). At the conclusion of the

intervention, those who produced the video posted on YouTube completed a survey on their perceptions of the impact of the video project on communication skills, engagement and learning in the course, and comfort with using video production technologies (SP). A panel of experts assessed the video projects submitted by participants in the intervention group using a rubric developed from assessments of traditional written communication (VMR). Finally, nine participants of the intervention group volunteered to participate in a structured interview designed to explore the challenges encountered, problems solved, and course/subject knowledge gained, as well as any impact on how video/television/film media are consumed. The instruments are described in more detail in later sections of this chapter.

Description of the Intervention

As described earlier, this study used a quasi-experimental design in which knowledge of media literacy was compared for participants in control and intervention groups. What follows is a description of the course from which students in the control group were drawn, the course from which students in the intervention group were drawn, the one-hour media literacy instruction used for both groups, and the video project instruction and assignment used with the intervention group.

Description of the Writing Course – Control Group

The writing course from which members of the control group were chosen is a required general-education course in persuasive writing with discussion, workshops, and conferences that emphasize the writing process. The course is offered by the Department of Arts, Science, and Business in cooperation with the Department of English housed on the main campus. Students in the course were primarily first- or second-year undergraduates from a variety of subject majors. Multiple sections of this writing course are taught; however, control group participants were drawn from only two sections. The professor teaching these sections had professional experience in visual communication and the arts and was interested in collaborating in this study, largely due to its integration of visual communication into a technology course. Historically, the campus where the course is taught has focused on technology and aviation majors. This has changed in recent years, as new academic programs in social work, family studies, and personal finance have been made available. Additionally, some students take general-studies coursework, including this writing course, with the intention of transferring to another campus or institution

to complete their majors. Consequently, students in the control group came from a variety of academic majors.

> The course overview provided in the instructor's syllabus mentions that:
>
> … students will need to make decisions about what evidence to choose, what organizational patterns to employ, and what tone and style to use. Importantly, this course enhances their ability to imagine the needs and values of their readers and to understand the reasons for why they might hold differing viewpoints (R. Moritz, personal communication, January 14, 2014).

This consideration of audience, tone, style, and evidence demonstrates that the course emphasizes critical thinking and communication skills that are compatible and consistent with the aims of the media literacy outcomes that were examined in this study. In fact, among the explicitly named learning outcomes for the course are 1) analyzing "specific audiences for print, *visual, and media texts*" and 2) producing "a broad range of arguments for various contexts and audiences: evaluations, proposals, *digital media, visual advocacy and advertising* 'texts'" (R. Moritz, personal communication, January 14, 2014).

Description of the Technology Course – Intervention Group

The technology course from which members of the intervention group were drawn is part of a computer technology curriculum offered by the Department of Engineering Technology. The course provided an introduction to topics related to computer networking technologies such as routers, switches, hubs, and related protocols. Students learned about the hardware and software that makes computer networks function. To help students see the importance and relevance of the subject, a good deal of emphasis was placed on the technology of the Internet.

The course is required for all computer systems technology majors, as well as for majors in electronics technology, digital media technology, and unmanned aerial vehicles/aviation. Computer engineering technology and aviation students comprised the largest academic major in the course, followed by a small subset of electronics engineering technology students. Students majoring in digital media were the smallest major group. A primary goal of the technology course was to ensure that each student take away a better understanding of the technology that interconnects us in the digital age.

The course followed a lecture/lab format (two hours of lecture along with weekly labs) that explored a given topic related to computer networks. Examples of the laboratories include

network cabling, FTP and Web server software, protocol analysis through packet sniffing, the OSI model of computer networks, TCP/IP protocol suite, routing protocols, programming with Python, and, in a lab activity pertinent to this study, digital video editing. Because of the diversity of majors represented and varying levels of interest in this subject area, the course presents a difficult instructional challenge in engaging all students. In addition to lectures and labs, active learning activities were frequently used to draw students into learning the material, including the use of skits, simulations, and small group discussions, as well as the video term paper project that was the focus of this research.

Media-Literacy Instruction

After taking a pre-test of media literacy knowledge, students in both the control group and the intervention group received approximately 40 minutes of media literacy instruction. A class review and discussion of the video clips viewed during the pre-test was held. During the discussion, the five key questions of media literacy (Thoman & Jolls, 2003) were introduced, along with possible answers to these questions as related to the videos. Because it was central to constructing compelling videos, significant attention was given to "What techniques are used to attract my attention?" Students were given the opportunity to consider the constructed nature of these videos. Topics addressed included the use of lighting, sound and music, scene editing, and various shot types such as close-ups, medium range shots, establishing shots, and so forth.

The first example provided in this class session highlighted the editing techniques used in a "Happy Princess Wonderland" commercial from Citibank that was viewed as part of the pre-test along with two other slightly different versions of the same commercial that demonstrated how stories in video can easily be changed through clever editing. A second example featured film director Alfred Hitchcock discussing this same topic (Fraser, 2012). In this video, Mr. Hitchcock showed two sequences of scenes that told entirely different stories using an editing technique originally developed by the Russian filmmaker Vsevolod Pudovkin (Giannetti, 2008; Richards, 2013). Both scenes showed Mr. Hitchcock looking at something and then cutting away to show what he was looking at, followed by a shot of the director smiling. In the first sequence, a scene of a mother playing with her child was inserted between the shots of Mr. Hitchcock looking and then smiling (Figure 3). In the second sequence, the mother was removed and a

beautiful girl in a swimsuit replaced her, while the looking-then-smiling shots remained identical (Figure 4). The story that was implied was dramatically altered

Figure 3. Hitchcock sees a mother and child.

Figure 4. Hitchcock sees a beautiful girl.

This Hitchcock video also played a role in the experimental intervention. While both the control group and the intervention group students saw this example and participated in a class discussion about it, the intervention group students also completed a laboratory activity in which they edited their own video-clip example using the looking-then-smiling Alfred Hitchcock.

Description of the Video Project – Intervention Group

During the first half of the intervention group course, a video term paper research project was assigned requiring students to research a topic on computer networks or the Internet (See Appendix A) and create a video "term paper" that shared what they had learned with classmates and online viewers through YouTube. Two weeks of the 16-week intervention group course were dedicated to completing this video term-paper project, with instruction linked to the following core media-literacy competencies: 1) search strategies, 2) reading, viewing, listening, and discussion, 3) close analysis of texts, and 4) multimedia composition (Hobbs, 2011). Students in the course received instruction on critical viewing of videos as well as techniques related to making and editing videos for communicating with a broad audience.

To assist with the preparation for this task, four of the hour-long course lecture sessions and one two-hour lab session during the project were developed for use as a workshop for working with video production topics and issues. The first classroom session was devoted to administering the pre-test of media literacy with critical video viewing and analysis using the TAVV instrument. The remaining time in this session was used to provide the same media-literacy instruction provided to the control group. During the second classroom session, the instructor introduced requirements of the video term-paper assignment. After the project was introduced, a staff librarian gave a 45-minute presentation on useful research strategies. Accessing the various research databases that are available through the library website was demonstrated, along with finding appropriate sources for acquiring video assets to be incorporated into the finished videos. A discussion of copyright and fair use was included in this session. In the third class session, the instructor provided a demonstration of the video-editing software that was available on public campus computers. This software included Sony Vegas and Adobe Premiere in a departmental computer lab, as well as the Pinnacle Studio app installed on iPad tablet computers that could be checked out from the library. After the third classroom session, a two-hour laboratory activity was held in which students become familiar with using the video-editing software tools and techniques. Students doing the lab activity were asked to edit the Alfred Hitchcock video (described in the previous section) to make their own version of the looking-then-smiling story. Once the lab activity was completed, students began working on their video term-paper projects. One additional in-class session was allocated to have student questions about the project answered and to resolve any technical issues encountered.

Video Project Requirements

Students were provided the following parameters for completing their video assignment:

- Select a topic from the list of approved topics (See Appendix A).
- Create an original video essay that informs the viewing audience about a particular topic related to digital computer networks and/or the Internet.
- Length of video is 2 to 4 minutes, including credits. No more, no less.
- The format of the video should be a minimum of 360p (640x360). You may make it higher resolution, but this is the minimum requirement.
- The video must be uploaded and made available for public viewing on YouTube. You may publish under an anonymous pseudonym that does not identify you.

- Comments on your video should be turned off to eliminate the need for commentary moderation.
- Like a well-written research paper or informative speech, the video should have a clear and logical structure with an introduction, a body, and a conclusion.
- The video should not be an opinion piece but rather the result of research you have conducted about your topic, with arguments supported by credible, authoritative sources. One of these sources must be a printed book obtained from the library or through interlibrary loan. Two of these must be from edited journals or periodicals. Additional sources can be from the Internet and can be in multimedia form.
- All sources used must be cited in the video credits or in the video description on YouTube. If you use someone else's work in any form that you did not yourself create, such as graphics, video, images, sounds, etc., it must be cited as such. Non-original video clips should not exceed 15 to 20 seconds in length.
- In creating the video, you must obey all applicable laws, including those pertaining to copyright and privacy.
- The video should be technically well executed. Things to consider: lighting, sound, composition, camera angles, scene transitions, and pacing.
- The video should be visually interesting and aesthetically pleasing to watch. Be succinct, to the point, and, when possible, entertaining.
- The video should demonstrate a mastery of the information conveyed. You researched it, and you are the expert; your video should show this expertise.
- The video must be explicitly connected to the course topic of computer networks. For example, a video about Bill Gates should not simply be a biographical piece but should convey his contribution to the development and operation of computer networks.

Other Video Project Recommendations and Suggestions

- Use the library's Networking 1 LibGuide webpage as a starting point for your research.
- Use a musical score to supplement your piece. The music you choose should bolster and not detract. You need to have permission or a legal right to use the music. Consider using Creative Commons-licensed work for this purpose.

- Use actors you recruit, do a stop-motion or Flash animation, narrate a slideshow or computer-screen presentation, or assemble pieces of video you find online into an original, finished work.
- Use an automobile (parked and not running) as an audio-recording booth. It does a surprisingly good job for recording narration.
- Be entertaining, surprising, insightful, refreshing, joyful, engaged, and passionate about your topic.

Using the assignment guidelines, students created video term papers on their research topics with a length between 2 and 4 minutes. The video length requirement was firm. No exceptions were made for videos that were shorter or longer. Major mileposts built into the video project assignment included: 1) selection of research topic from the instructor-provided list of appropriate topics (Appendix A), 2) compilation of a list of possible references and resources to be used, 3) submission of a rough draft video for instructor review, and 4) publication of a final version video on YouTube. Students created videos for their chosen topics using video editors of their choice according to the assignment guidelines. After finishing this video, each student was required to create an account on YouTube and publish his or her work to it. After the student-made videos were finished and posted on YouTube, an in-class viewing of their work was held during two lecture sessions of the intervention group class. This intervention began in early April 2014 and concluded in early May 2014.

Because the videos were composed of video footage, students faced the problem of obtaining usable footage for their video projects The most straightforward solution was to create original video footage using camcorders, animation tools, screen-capture software, and stop-motion photography; however, this was also the most technically demanding technique. Another acceptable option was to locate and download online videos for editing into the final project. Including the video work of others in an academic work as a critique or commentary falls under the "fair use" protections provided in copyright law, provided that the financial viability of the original work is not damaged (Hobbs, 2010). Students were working on 2- to 4-minute video productions, so it is difficult to imagine a situation where a copyright owner would sustain a financial loss from such a use, especially when students followed the requirement of making

their own transformative "original work" that was distinct and unique from the original by using only small excerpts (not exceeding 15 to 20 seconds in length).

Description of the Data Sample

The data sample used in this study were convenience samples drawn from 1) a writing course taught by a colleague (control group) and 2) a technology course taught by the researcher (intervention group) at the same branch campus of a large, land-grant research university in the Midwest. Other options for possible control groups were considered, including using another science or technology course. However the enrollment in the technology course has grown substantially larger than similar technology courses offered on the same campus. The writing course tends to have similar enrollment numbers as the technology course. Students in the control group were mainly traditional-age students under the age of 25, first-year undergraduate students coming from a variety of majors, and an even mix of women and men. Students in the intervention group were in technology-related majors, both traditional and non-traditional aged students, fairly evenly distributed with regard to year in college, and mostly men. More detailed demographic similarities and differences are presented in Chapter 4.

Development and Testing of Data Instruments

As described earlier, five instruments were developed with which to collect data. Two of the instruments, a survey of student demographics and prior experience with video experience (SVE) and a test of critical media literacy (TAVV) were administered to both the control and intervention groups. Two of the instruments, the SP student perceptions survey and the VMR video assessment rubric, were used to collect data from the students in the intervention group. The fifth instrument was an interview protocol used to collect data from nine student volunteers from the intervention group. What follows is a description of each instrument.

Survey of Video Experience (SVE)

The first instrument used in the study was the Survey of Video Experience or SVE (Appendix B1). This instrument was used to collect basic demographic information as well as data pertaining to students' past experience with video-making technologies. Based on the existing literature related to the use of video projects in science and technology courses (Jarvinen et al., 2012; Lichter, 2012; Ludlow, 2012) along with studies discussing the technology literacy

of undergraduate students (Ashley et al., 2012; Kennedy et al., 2008; Kvavik & Caruso, 2005; Schmidt, 2010), age, gender, year in school, and subject major were included in the SVE. As traditional-aged students progress through a four-year undergraduate course of study, their thinking matures (Belenky et al., 1997; Perry, 1970) and their attitudes towards using technology change (Kvavik & Caruso, 2005). Knowing the level of prior student experience with video-making was also important, as more experienced video-makers may tend to focus more of their cognitive efforts on producing quality, course-related content, while those with less experience may have had to expend more energy on the technical aspects of completing the video assignment. Prior research suggests that as the complexity and specialization of technology tools increases, fewer students use them (Kvavik & Caruso, 2005)

A first version of the SVE instrument was tested in a 2013 pilot study. Slight adjustments were made to the demographic data being collected, such as reducing the age categories from the original four to the current two categories that describe traditional versus non-traditional aged students. Subject major categories not selected by the pilot sample were removed from the instrument as well. (See Appendix E for additional detail on the pilot study.)

Test of Analytical Video Viewing (TAVV)

To compare the media literacy knowledge gained by the control and intervention groups, the Test of Analytical Video Viewing (TAVV) (See Appendix B2) was administered as a pre-test to both the control group and the intervention group immediately prior to the 40-minute media literacy instruction. Three video clips were used in the pre-test and post-test. (See Appendix C). The TAVV was administered again as a post-test to both groups at the conclusion of the video project completed by the intervention group. The researcher developed the TAVV by adapting instruments used in Arke & Primack (2009), Hobbs & Frost (2003) and Ashley, Lyden, & Fasbinder (2012). The TAVV used a framework similar to Hobbs' (2011) media literacy conceptual framework: access, analyze, create, reflect, and act; and was aligned with the related five key questions of media literacy (Aufderheide, 1993; Thoman & Jolls, 2003). Table 1 shows the links between Thoman & Jolls' (2003) key questions of media literacy and the questions on the TAVV instrument.

Table 1

Relationship of TAVV Questions to Key Questions of Media Literacy

Test of Analytical Video Viewing Instrument (TAVV)	**Key Questions of Media Literacy**
1. Who is the sender of this message? From where did the information originate?	1. Who created this message?
2. In a sentence or two, describe the main message of the video using your own interpretation.	5. Why was this message sent?
3. Are there other possible interpretations of this video's main message? If so, provide an example of how others might interpret the main message.	3. How might others understand this message differently from me?
4. Who is the target audience of this video? From the perspective of the video's creator, describe the ideal characteristics of viewers of this video.	4. What lifestyles, values and points of view are represented in, or omitted from, this message?
5. What specific techniques are used in this video to attract and hold your attention?	2. What techniques are used to attract my attention?
6. What is the purpose of this video? Check all that apply.	5. Why was this message sent?

The instrument developed for Arke & Primack (2009) upon which the TAVV instrument was primarily based reported internal consistency with Cronbach's alpha at 0.90, and average inter-item covariance of 0.35 on 21 items measuring media literacy for radio, TV and print media. Although it was not published in the original article, the researcher requested and received a copy of the instrument used in Arke & Primack (2009) from co-author Dr. Edward Arke. Upon receiving that instrument, the TAVV was developed using a similar format as what was used for the TV measure of media literacy. Internal consistency for the TV portion of Arke & Primack's (2009) instrument was reported with Cronbach's alpha at 0.79, and average inter-item covariance of 0.41 on 7 items.

Prior to the study, a pilot test of the TAVV instrument was conducted. The results of this test can be found in Appendix E. The TAVV used in this study was not modified as a result of the pilot test.

Student Perceptions of the Networking 1 Video Project (SP)

A student survey (Student Perceptions of the Networking 1 Video Project (SP)) was given to the intervention group at the conclusion of the video project (Appendix B3). Developed by the researcher, this instrument was also grounded in the media-literacy framework described by Hobbs (2011):

1. Access - Finding and sharing appropriate and relevant information using media texts and technology well

2. Analyze - Using critical thinking to analyze message purpose and meaning
3. Create - Composing or generating media content
4. Reflect - Considering the impact of media messages and technology tools on our thinking and actions
5. Act - Working individually or collaboratively to share knowledge and solve problems (p. 12)

Three colleagues with expertise in computer technology and written and verbal communications examined this instrument for appropriateness and validity of the questions. A pilot test was conducted in the spring 2013 semester in the computer technology class to test the video term-paper intervention and the SP. The results of the survey data collected during the pilot test are presented in Appendix E. Some minor changes were made in the final version used in this study. In the pilot test, the SP included demographic questions as well as questions about previous experience with using video technologies. These questions were removed from the SP and placed in the SVE. Additionally, one question was added that explored the students' ability to assess the quality of various information sources.

Interview Protocol

To gain additional evidence not gleaned directly from the SP instrument (Appendix B3), follow-up interviews with nine students were conducted to gather data about student perceptions of the video projects. An audio recording of each interview was made and transcribed for coding and analysis.

The interview protocol (Appendix B4) was developed using the media-literacy framework (Aufderheide, 1993; Hobbs, 2011; Thoman & Jolls, 2003) and key questions of media literacy (Hobbs, 2011) as a guide. Two expert faculty members from the areas of computer technology and communications reviewed the interview protocol for validity. A test run of the interview protocol was conducted with three students who participated in the previous semester's video project. The students were able to respond to the questions in meaningful ways that provided data useful in answering the relevant research questions. The questions in the final version of the interview protocol were largely unchanged from those used in the pilot test; however, unexpected insights were gained when a student described how other students in the

class were affected by the video project. As a result, a question related to having conversations about the project with other students was added to the final version of the interview protocol.

Video Maker's Rubric (VMR)

The VMR rubric (Appendix B5) is a modified form of two example writing rubrics—the first being a rubric designed for the 6+1 trait® writing model (Kozlow & Bellamy, 2004) and the second a part of the Association of American Colleges and Universities VALUE rubric series (Finley, 2012). Reliability information for the Kozlow & Bellamy (2004) rubric was not available, nor was reliability information about the written communication VALUE rubric. However some information for the VALUE rubrics as a series was found (Finley, 2012). Finley (2012) claims that the VALUE rubrics have a high degree of face validity because teams of faculty from across the nation that were involved in teaching and assessment developed them, and approximately eleven thousand people from three thousand institutions and organizations have accessed them. Finley reported that using faculty experts on the rubric development team contributed to content validity. Finally, inter-rater reliability was calculated using a kappa statistic with a -1.0 score representing perfect disagreement between scorers and a +1.0 representing perfect agreement. The kappa statistic for the combined average of the three rubrics was 0.69. Additionally, a percentage of agreement score was calculated in which an approximate agreement in scores between raters was measured. The percentage of agreement average for the three rubrics was 80%. However, it must be noted that these reliability estimates were for only three of the 15 VALUE rubrics (Finley, 2012) and not for the written communication VALUE rubric that was a model for the VMR in this study.

Videos using the VMR were rated along five dimensions: Ideas, Content, and Purpose; Organization and Structure; Voice and Creativity; Delivery, Visuals, and Aesthetics; and Technical Requirements. Scores for each dimension ranged from 1 to 4 points, for a possible total of 20 points. The first category, Ideas, Content, and Purpose, was used to measure how well the student demonstrated a specialized understanding of the networking technology concept that he/she had researched. The Organization and Structure category dealt with how the video was arranged and organized. The Voice and Creativity category examined how the video creator communicates with his or her audience. The Delivery, Visuals, and Aesthetics category measured how well the video communicated in ways that were pleasing to the eye and ear. The

Technical Requirements category assessed how well the video adhered to the length and video resolution requirements.

A three-person video assessment team consisting of the researcher, a computer faculty member, and a writing faculty member tested an early version of the VMR and provided feedback for improvements using real student videos from a previous semester. The assessment team felt that having only three rating levels did not provide enough granularity to distinguish between low-medium and high-medium work, so an additional level was added to the middle rating. The rating system used was: 1 point for beginning, 2 or 3 points for developing work, and 4 points for exceptional work.

Data Collection and Analysis

Anonymous Participant Codes

Before data collection began, each study participant was randomly assigned an anonymous code that was used to uniquely identify individuals without revealing any identities. The Department of Engineering Technology administrative assistant, using the course rosters downloaded from the university courseware system, created a master list of codes and associated student names in the Excel file "ParticipantCodes.xls." The administrative assistant attached a printed copy of each participant's code to a copy of each data collection instrument that was distributed to students. Each participant then removed and kept their code for future reference. Participants were also asked to record their codes in a safe place that was easily accessible, such as a mobile phone, because they needed to refer to the same code for use on a variety of instruments throughout the study. The administrative assistant kept the ParticipantCodes.xls file to assign codes to each data collection instrument, and then deleted the file at the conclusion of the study.

TAVV Administration Protocol

Detailed protocols were used to administer both the TAVV pre- and post-tests. These protocols can be found in Appendix F.

Video Submission Form

Students in the intervention group submitted their completed video projects for assessment and grading via an online survey form that protected each person's identity by asking for only two pieces of information: the anonymous participant code and the URL for the video posted on YouTube. This form, hosted by Qualtrics, used the survey system provided by the university for secure data collection. After the anonymous participant codes and associated video URLs were submitted, an electronic file in CSV format was downloaded from the Qualtrics system for the assessment and grading of the videos by the video assessment team.

Data Analysis

Table 2 summarizes which data collection instruments were used to answer each of the five research questions. Descriptive statistics were used to summarize the data gathered from the SVE, TAVV, SP, and VMR. Where appropriate, t-tests of paired samples were used to explore differences, as described in more detail in Chapter 4. Data gathered from the interview protocol was initially examined question by question in terms of emergent themes. These themes were later synthesized with an analysis of the quantitative data in answering the research questions.

Table 2

Relationship of Instruments to Research Questions

Research Question	SVE	TAVV	SP	Interview	VMR
1	X			X	
2		X			
3			X	X	
4			X	X	
5			X	X	X

Ethical Considerations

Video as a New Experience

This study was designed with the safety and well being of the college student participants in mind. Aspects of the study could have been perceived as distressing to some participants, depending upon the attitudes and values that they embrace with regard to using technology. For

many participants, completing and publishing the video term-paper project was a new and challenging experience. New experiences are by nature stressful and the researcher recognized that learning involves a certain amount of cognitive dissonance. However, too much stress is detrimental to learning (Jensen, 2008). Therefore, precautions were taken to minimize the level of stress to which participants in the study were subjected. One strategy was providing ample time in the technology class for demonstrations and discussions related to video making. To assist with the preparation for completing a video, four of the 50-minute course-lecture meetings and one two-hour lab session were designated as a workshop for video production topics and issues. Additionally, although the work had to be published online on YouTube, participants were permitted to use an anonymous YouTube account not associated with their real names to protect their identities. Also, during the study period, participants were encouraged to disable comments through their YouTube account preferences to avoid the inappropriate or irrelevant commentary from Internet viewers that sometimes occurs.

All students enrolled in the technology course were required to publish video term papers online as a class assignment. To control for potential instructor/researcher bias in assigning student grades to the video projects, an independent three-person assessment team comprised of a communications faculty member, an English/writing faculty member, and a computer technology faculty member evaluated each video project using the VMR assessment rubric (Appendix B5). Apart from training the assessment team on procedures to follow for video assessment using the rubric, the instructor/researcher was not involved in evaluation or assigning grades to the video term-paper projects.

The video project assignment was required of all students in the intervention group class. However, all students were informed that they could opt out as participants by not having their video project included as a part of the study without affecting their grades or standing in the course. No students declined to participate in the study in either the intervention or control group although two students did not complete the video project. The VMR was used to assess all student videos that were submitted in the intervention group.

Informed Consent and Anonymity Protection

Students who elected to participate in the study provided informed consent and were assigned a participant code number on the first day of testing to ensure anonymity. Because this

was educational research conducted in the context of a higher-education classroom setting, it was eligible for an IRB exemption (Appendix G) although still subject to IRB review. Except for the interview protocol (Appendix B4) the following statement was affixed to each of the data-collection instruments, notifying students of their rights pertaining to participation in the study.

> Completing and returning this anonymous survey implies that you give your informed consent to participate in a research project with the aim of improving college classroom instruction. This implied consent consists of the following statement: "I understand this survey is for research, and that my participation is completely voluntary. I understand that my participating or not participating in the survey involves no penalty, or loss of benefits, or academic standing to which I may otherwise be entitled. (Appendix B)

Students who chose not to participate in the study left any data-collection instruments they received blank. All students enrolled in the technology course were required to complete and submit video projects, regardless of their status as study participants. To retain anonymity and to protect from any potential instructor bias, all students used the anonymous submission form to submit their video projects for review by the video assessment team. Students who did not wish to include their video project in the study indicated their desire to opt-out via the video submission form.

Issues of Validity and Trustworthiness

The extent to which instruments accurately measure what they are believed to measure (Mertler, 2006) is commonly known as validity. Different methodologies define validity differently. For example, the 1999 edition of *Standards for Educational and Psychological Testing* defines validity as the "degree to which all the accumulated evidence supports the intended interpretation of test scores for the proposed purpose" (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999). However, establishing validity with qualitative methods is often a matter of establishing trustworthiness (Mertler, 2006).

Discussion of Validity Issues Relevant to Mixed-Methods Action Research

The research design of this study employed both quantitative and qualitative research methods. Therefore, issues pertaining to data validity for both approaches were considered.

Threats to Quantitative Validity

According to Creswell (2003), threats to validity of quantitative data can be internal or external in nature. Internal threats to validity can occur when problems arise with experimental procedures or treatments such as changing the instrumentation during an experiment, diffusion of information between control and intervention groups, or maturation of participants over time. The short duration of the study over the course of a few weeks in a single semester minimized maturation effects of the participants. Using instruments developed and tested prior to the beginning of data collection minimized internal threats to validity. As described earlier, four of the instruments used in this study (SVE, TAVV, SP, and VMR) were based upon instrumentation or frameworks used in prior studies, examined by peer educators, and pilot tested for appropriateness for answering the research questions. Diffusion of information between the control and intervention groups was possible, given the small branch campus on which this research took place. However, the intervention (of completing a video project) was complex. It was not easy to fully disclose to someone outside of the intervention group. Even if a control group participant were made aware of the video project details, it was extremely unlikely that such a person would complete the experience of making a similar video on his/her own.

External threats to validity occur when problems arise with generalizing a study's findings. Because of the small sample size used and the nature of action research, generalization of the quantitative findings was not a goal.

Validation of Qualitative Data

Creswell states that triangulation and writing detailed descriptions are two of the most popular and accessible methods of addressing validity issues in qualitative research (Creswell, 2007). Triangulation and detailed descriptions were both used in this study. A review of Table 2 demonstrates that every research question posed, with the exception of research question #2, drew data from multiple qualitative and quantitative sources, enabling the data used in answering the other research questions to be triangulated.

Improving the learning situation—not just for self but for others, through the concept of transferability—is Anderson et al.'s (2007) suggestion for an action-research equivalent of generalization. Citing the work of Lincoln & Guba (1985), this transferability of knowledge depends upon the original researcher providing sufficient descriptive data so that others hoping to apply or transfer the knowledge elsewhere might determine the degree of contextual

similarity. The more the researcher uses the rich, thick descriptions recommended by Creswell (2007), the better transferability is enabled. This chapter presented considerable detail on the student population served by the institution in which the study was conducted, the composition of the control and intervention groups, the media-literacy instruction common to both the control and intervention groups, the instruction on video production provided to the intervention group, the video project requirements, and general support provided to the students in the intervention group as they completed the video project. Interviews conducted with the nine volunteers in the intervention group who completed the video project provided additional descriptive detail on the video production experience from the perspective on the students.

Summary

This study explored the impact of using a video term-paper project and media-literacy instruction in an undergraduate technology course to address student engagement and ownership of learning, communication skills, media-literacy concepts, and course content related to computer networking. It used an action research design with mixed methods in an undergraduate teacher/researcher's own classroom.

A quasi-experiment design was used to examine the impact of a video term-paper project about computer networking on students' understanding of media literacy concepts. The SVE was used to collect information on students' demographic variables as well as prior experience with video production. Control and intervention groups were then exposed to the same 45-minute instruction on media literacy. Members of the intervention group also completed a video term-paper project on a selected topic in computer networking. Pre- and post-test scores on the TAVV were used to examine the impact of the video term-paper project on student understanding of media literacy. Two instruments were used to examine the intervention group students' perception of the video term-paper project (SP) and the quality of the videos (VMR). Interviews (IP) were conducted with nine intervention student volunteers to explore student perceptions of the intervention and its impact on their ownership of learning and increased knowledge in course-related concepts, communication skills, and media literacy concepts.

Chapter 4 - Results

Introduction

As described in Chapter 3, two groups of student participants were selected from similarly sized convenience sample courses: a technology course taught by the researcher and a writing course taught by a colleague on the same branch campus. The writing course sample served as the control group, while the networking course sample served as the intervention group. Five instruments were used to collect data: Survey of Video Experience (SVE), Test of Analytical Video Viewing (TAVV), Student Perceptions of the Networking 1 Video Project (SP), Video Maker's Rubric (VMR), and an interview protocol. This chapter presents the data collected with these instruments. Chapter 5 provides the analysis of the data within the framework of the research questions.

Survey of Video Experience

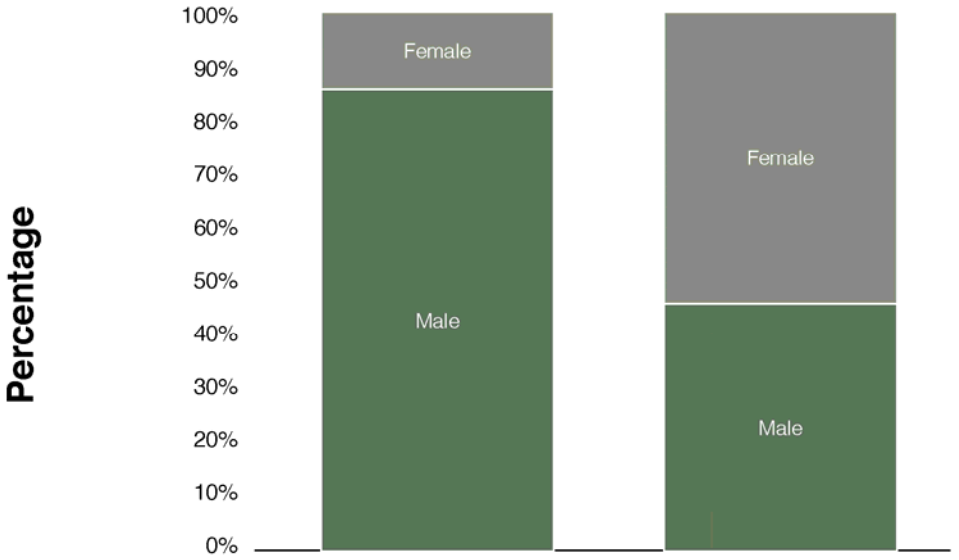
The SVE (Appendix B1) was comprised two parts. The first part asked about the study participants' demographic background and the second part asked about the students' prior experience with using video production technology. Demographic variables included participant age, gender, year in college, and subject major. Measures of video experience in the SVE included doing class video projects in middle and/or high school and in college courses, uploading videos for others to view online, and using video-editing software tools. Results of the SVE are presented in the following sections.

	Intervention Group		Control Group	
Non-Traditionally Aged (25+)	17	49%	5	20%
Traditionally Aged (18-24)	18	51%	20	80%

Figure 5. Participant Age.

Participant Age

Student participants were categorized into two age groups—traditional (aged 18–24, n=38) and non-traditional (aged 25+, n=22) age groups. As shown in Figure 5, the intervention group (35 students) was almost evenly divided between traditional-aged and non-traditional-aged college students. However, the control group (25 students) had a majority of traditional-age students; only five of which were non-traditional age.

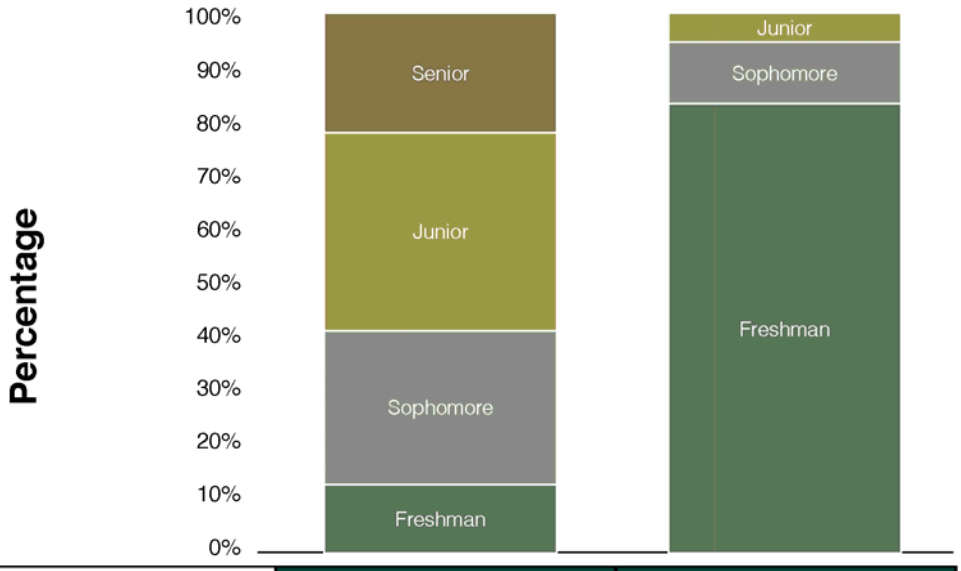


	Intervention Group		Control Group	
Female	5	14%	14	56%
Male	30	86%	11	44%

Figure 6. Participant Gender.

Participant Gender

The intervention group was predominantly male, while the control group was more evenly divided between male and female students. As shown in Figure 6, less than 20% of the intervention group was female, while the control group had a majority of female students (56%). In the intervention group, four of the five female participants were non-traditional-age college students; 13 of the 30 male participants were non-traditional-age. However, in the control group, only two of the 14 female students and three of 11 male students were non-traditional-age college students.

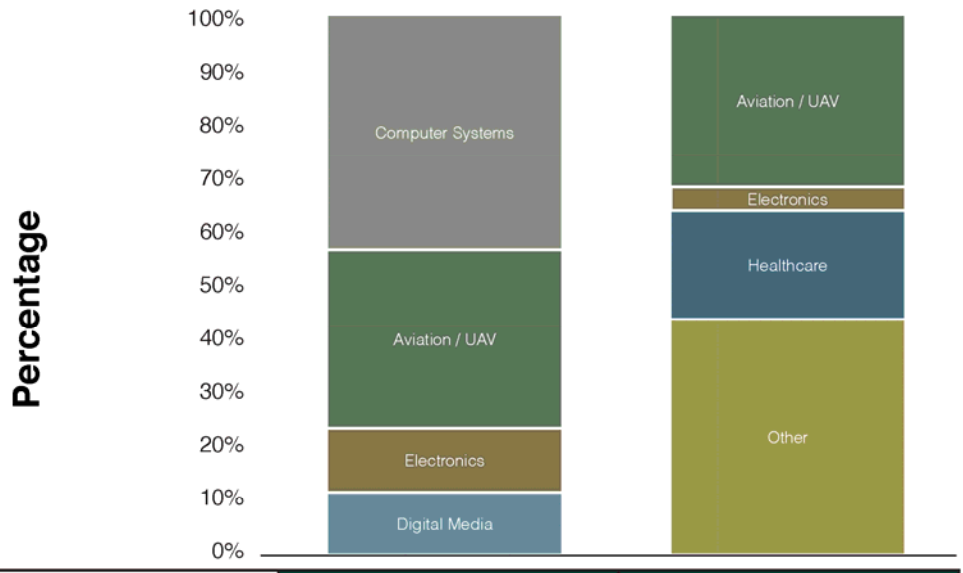


	Intervention Group		Control Group	
Senior	8	23%	0	0%
Junior	13	37%	1	4%
Sophomore	10	29%	3	12%
Freshman	4	11%	21	84%

Figure 7. Participant Year in College

Year in College

The intervention group was more diverse than the control group in terms of participant year in college. While the intervention group was more evenly divided among all four years of undergraduate study, the control group consisted primarily of freshmen students. As shown in Figure 7, 84% of the control group students were freshmen compared to 11% of the students in the intervention group. Juniors and seniors in the intervention group were 37% and 23%, respectively—a sum total of 60%. The control group, having just one junior and no seniors, comprised only 4% of student participants.

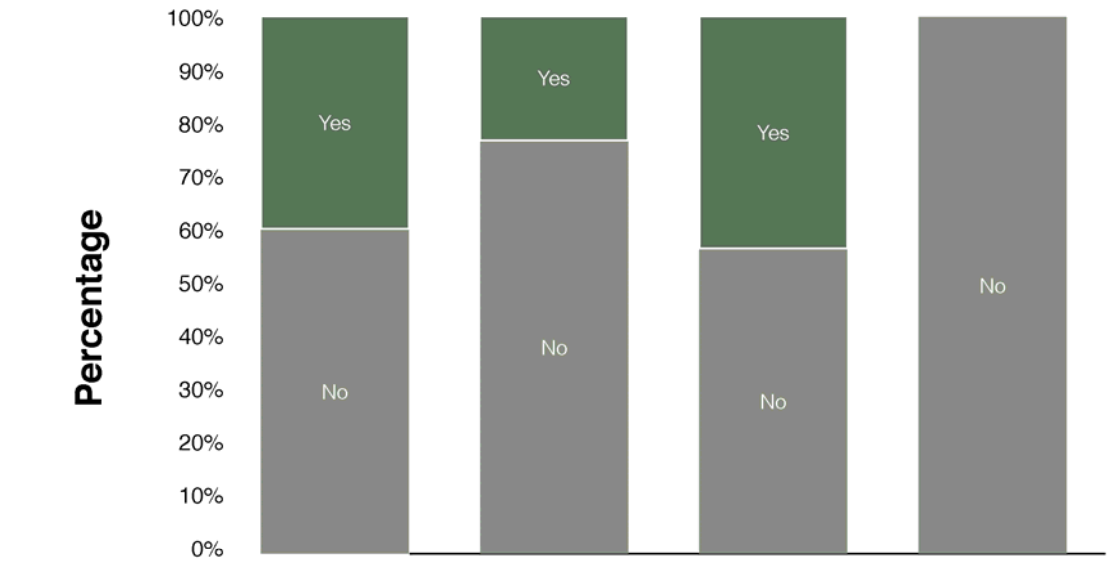


	Intervention Group		Control Group	
Computer Systems	15	43%	0	0%
Aviation / UAV	12	35%	8	32%
Electronics	4	11%	1	4%
Digital Media	4	11%	0	0%
Healthcare	0	0%	5	20%
Other	0	0%	11	44%

Figure 8. Participant Major.

Subject Major

With regard to the participants' chosen subject majors, the control group was more heterogeneous than the intervention group. Thirty-six percent of the control group was studying in a major that could be characterized as technology-related, but every participant in the intervention group was studying in a technology major. As shown in Figure 8, students in the control group were studying in the following majors: aviation (32%), electronics (4%), healthcare (20%), and other majors (44%). Control group majors in the Other category included family studies, social work, communications, wildlife management, and undecided. Students in the intervention group were studying in one of four different majors: computer systems (43%), digital media (11%), aviation (35%), or electronics (11%). Aviation and electronics majors were represented in both the intervention and control group courses.

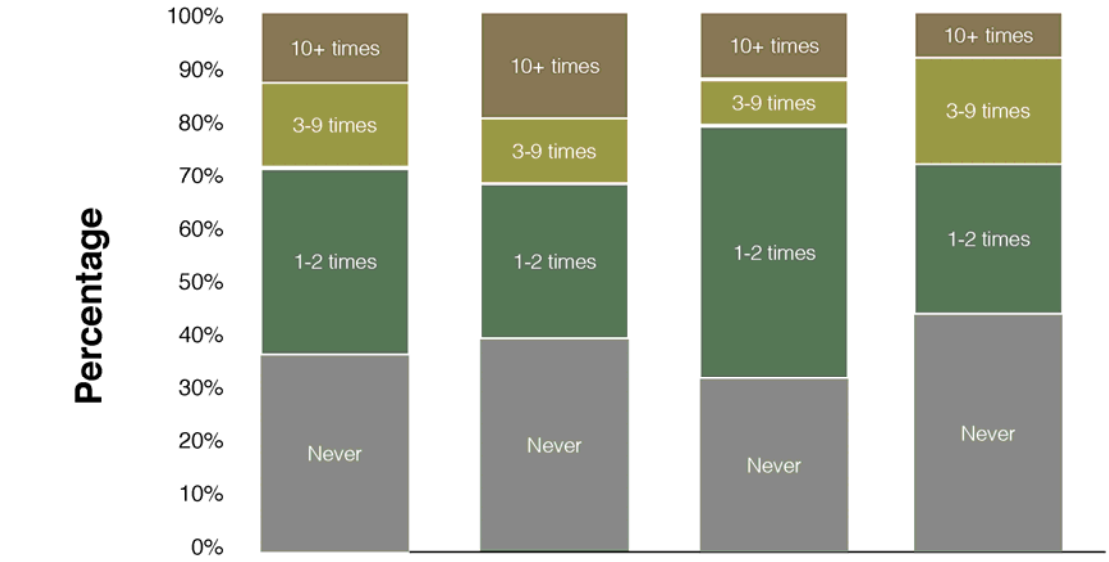


	Intervention Group				Control Group			
	Project in Middle/High School		Project in College		Project in Middle/High School		Project in College	
Yes	14	40%	8	23%	11	44%	0	0%
No	21	60%	27	77%	14	56%	25	100%

Figure 9. Video Projects in Academic Courses

Video Projects in Academic Courses

The SVE survey included two questions about prior experience with making videos for school projects—one for middle- or high-school courses and one for college courses. The majority of students in this study, as shown in Figure 9, reported that they had never worked on a video project for an academic course, either as college students or as middle- or high-school students. However, among those participants who did complete video projects in academic courses, there were more with video project experience in middle- and high-school classes than in college courses. Forty percent of the intervention group and 44% of the control group did video projects for academic work completed before attending college. However, none of the control group students had completed a video assignment for a college class and only 23% of the intervention group had been assigned a video project in college.



	Intervention Group				Control Group			
	Upload Video		Edit Video		Upload Video		Edit Video	
10+ times	4	12%	7	20%	3	12%	2	8%
3-9 times	6	17%	4	11%	2	8%	5	20%
1-2 times	12	34%	10	29%	12	48%	7	28%
Never	13	37%	14	40%	8	32%	11	44%

Figure 10. Video Production Experience.

Video Production Experience

The remaining questions on the SVE instrument asked students about their prior experience with video production in uploading video online and in editing video with software. Students could select from four experience levels that described these video uploading and editing tasks: 1) never, 2) 1–2 times, 3) 3–9 times, or 4) 10 or more times.

One third or more of the study participants reported no prior video production experience. As shown in Figure 10, the percent of students with no video production experience ranged from 32% (control group/uploading video) to 44% (control group/edit video). Overall, students had more experience with uploading video than they did with using video-editing software, but neither of these categories could be characterized as an extensive level (10 or more times) of experience. Twelve percent of student participants in both groups had uploaded video ten or more times. Twenty percent of the intervention group had edited video, while only 8% of the control group had previously completed this task.

Table 3

Uploading Video by Age

	Intervention Group				Control Group			
	Traditionally Aged		Non-Traditionally Aged		Traditionally Aged		Non-Traditionally Aged	
10+	1	5%	3	17%	2	10%	1	20%
3-9	4	22%	2	12%	2	10%	0	0%
1-2	10	56%	2	12%	11	55%	1	20%
Never	3	17%	10	59%	5	25%	3	60%

Table 4

Editing Video by Age

	Intervention Group				Control Group			
	Traditionally Aged		Non-Traditionally Aged		Traditionally Aged		Non-Traditionally Aged	
10+	4	23%	3	18%	1	5%	1	20%
3-9	2	11%	2	12%	5	25%	0	0%
1-2	6	33%	4	23%	7	35%	0	0%
Never	6	33%	8	47%	7	35%	4	80%

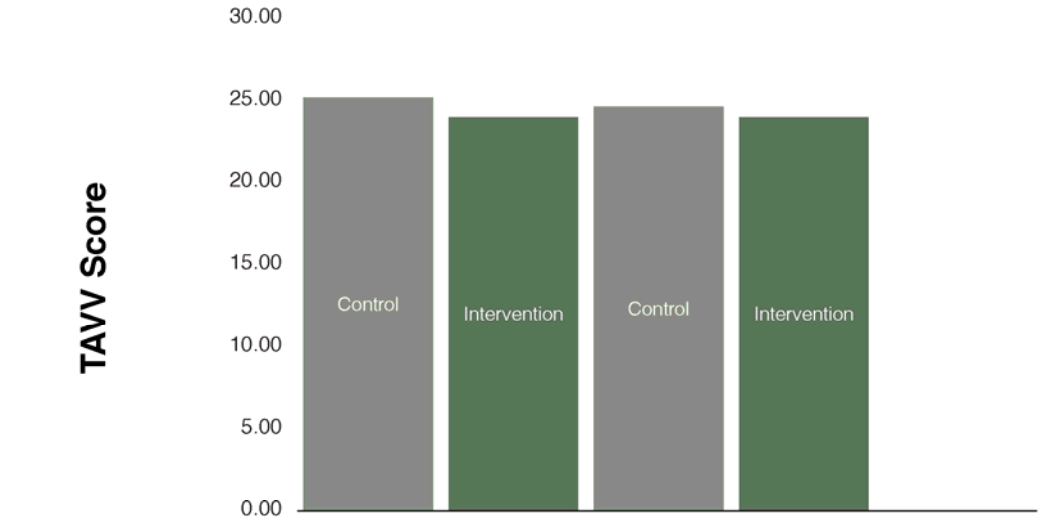
As shown in Tables 3 and 4, a greater proportion of non-traditional-age students than traditional-age students had never uploaded video or used video-editing software. However, at the highest measured level of video-production experience—those completing the uploading or editing task more than 10 times—a greater percentage of non-traditional-age students than traditional-age students had that level of experience, with the exception of the comparison for editing video in the intervention group.

Test of Analytical Video Viewing (TAVV)

The TAVV was administered to the control and intervention groups as a pre-test prior to the intervention and as a post-test upon completion of the intervention according to the protocol described in Appendix F. In the control group, a total of 16 students (64%) completed both the pre- and post-tests. In the intervention group, a total of 22 students (63%) completed both TAVV pre- and post-tests along with the prescribed video-project intervention. The maximum possible score on the TAVV was 36. Raw TAVV scores for the control and intervention groups

(Appendix D1 and D2) ranged from a low of 16 (44.4%) to a high of 31 (86.1%). Mean TAVV scores and related data for the control and intervention groups are shown in Figure 11.

Comparisons of pre- and post-scores showed a decrease in mean scores for the control group (25.00 to 24.00) and an increase for the intervention group (23.45 to 23.55). The post-test mean for both the control and intervention groups was 23.74, which is 66.9% of the total score possible. A one-tailed, paired t-test was computed on the pre- and post-test results of the TAVV for both the control and intervention group. Neither group demonstrated a statistically significant improvement from the pre- to post-test (Control, $p = 0.20$; Intervention, $p = 0.45$).



		Pre-Test		Post-Test		
Group	Participants	Mean	SD	Mean	SD	T-test
Control	n = 16	25.00	3.59	24.00	2.42	p = 0.20
Intervention	n = 22	23.45	2.98	23.55	2.82	p = 0.45

Figure 11. TAVV Mean Scores, Standard Deviations and t-Test Results.

The pre- and post-test results of the TAVV are shown in Figure 11. A frequency table of the TAVV scores for both the control and intervention groups is located in Appendix D10. For the control group, a large part of the decrease in TAVV mean score can be attributed to three of the top scorers on the pre-test whose post-test performance decreased by six points or more, making them the bottom three scorers on the post-test. The intervention group had no similarly large drops in score for individuals from pre- to post-test; however, there was one large (seven-point) increase in score. The control group (n =16) had five individual scores that increased, six

that decreased, and five scores that were unchanged from pre- to post-test, while the intervention group (n =24) had 13 increases, 10 decreases, and only one score that remained unchanged.

Additional analyses were conducted to examine differences across the demographic and video use variables included in the SVE. When viewing the data arranged by age, there was a decrease in the mean score from pre-test to post test among the traditional age students, while the mean score of non-traditional-age students increased in both the control and intervention groups. In both of these groups, traditional-age students had more negative gain scores from pre-test to post-test than positive gain scores. Among non-traditional-age students in the control group (n =2) there was student had a positive gain score and the other student had a negative gain score. The mean gain score for these two students was 0.50. The non-traditional-age students in the intervention group had twice as many positive gain scores (n = 8) as negative gain scores (n = 4) on the post-test, showing a 1.00-point average gain score. One-tailed, paired t-tests were conducted for comparisons of pre- and post-test scores, but no statistically significant differences were found in the four comparisons. For the control group, p = 0.17 for traditional age students and p = 0.45 for non-traditional age students. For the intervention group, p = 0.17 for the traditional age students and p = 0.17 for the non-traditional age students. The raw data for this analysis can be found in Appendix D3 and D4.

Comparisons between pre- and post TAVV scores were also viewed by year in college. The scores of first- and second-year students declined from pre- to post-test, while the scores of third- and fourth-year students improved. However, only the intervention group had any third- or fourth-year students who completed the TAVV, so a comparison between control and intervention groups was not possible based on year in college. One-tailed, paired t-tests were conducted with the possible comparisons of the mean pre- and mean post TAVV scores. No statistically significant difference between mean scores on the pre- and post-TAVV was found between the 1st and 2nd year students in the control group (p = 0.20). For the intervention group, no statistically significant differences were found between 1st and 2nd year students (p = 0.13) or between 3rd and 4th year students (p = 0.06). The raw data arranged by year in college for this analysis can be found in Appendix D5 and D6.

Summary of TAVV Results

T-tests were conducted to determine if the media literacy and and/or the video project produced a statistically significant increase in TAVV scores. Exposed only to the media literacy instruction, the mean score for students in the control group decreased slightly from 25.00 to 24.00, but this difference was not statistically significant. Exposed to both the media literacy instruction and the video project, the mean TAVV scores for students in the intervention group did increase slightly (from 23.46 to 23.50); this increase was not statistically significant. Pre-post TAVV score comparisons based on participant age and year in college also resulted in no significant differences. Analyses of TAVV scores based on gender and subject major variables were not conducted because of a lack of comparable subgroups.

Despite the lack of any statistically significant evidence of improvement from pre- to post-test, in the intervention group twice as many non-traditional-age students improved than declined. Among the traditional-age students in both groups, more students had lower post-scores than pre-scores. Non-traditional-age students may have responded more favorably to the media-literacy instruction than did the traditional-age students.

VMR Assessment of Video Projects

A three-person assessment team evaluated 29 videos created by participants in this study using the VMR (Appendix B5). This rubric included five categories: 1) Ideas, Content & Purpose, 2) Organization & Structure, 3) Voice & Creativity, 4) Delivery, Visuals and Aesthetics, and 5) Technical Requirements. Individual raters on the assessment team assigned scores for each category on a Likert scale ranging from 1 (*beginning*) to 4 (*exceptional*). Between these two extremes were two categories: 2 (*developing low*) and 3 (*developing adequate*). With 4 points possible in each of the five VMR categories, the maximum possible VMR score was 20. Each of the three raters calculated a total score, as shown in Table 5. These three total scores were averaged to determine a final VMR score for each video. The final VMR scores ranged from a low of 9.83 (49%) to a high of 19.50 (95%). The mean score for all 29 videos was 16.36 (82% of the maximum 20 points) with a standard deviation of 2.66.

Table 5

VMR Scores and Descriptive Statistics for Student Produced Videos

ID	Rater 1	Rater 2	Rater 3	Total	SD	Mean	Percent
NW522	20.00	19.50	19.00	58.50	0.41	19.50	98%
NW564	19.00	20.00	19.50	58.50	0.41	19.50	98%
NW622	19.00	20.00	19.50	58.50	0.41	19.50	98%
NW867	19.50	18.50	20.00	58.00	0.62	19.33	97%
NW789	18.50	19.50	19.00	57.00	0.41	19.00	95%
NW895	19.50	18.00	19.50	57.00	0.71	19.00	95%
NW053	19.50	18.50	18.00	56.00	0.62	18.67	93%
NW473	19.50	18.50	18.00	56.00	0.62	18.67	93%
NW175	18.00	19.00	17.50	54.50	0.62	18.17	91%
NW642	18.50	18.50	17.50	54.50	0.47	18.17	91%
NW749	18.00	18.00	18.00	54.00	0.00	18.00	90%
NW280	17.50	17.00	19.00	53.50	0.85	17.83	89%
NW716	17.00	17.50	18.50	53.00	0.62	17.67	88%
NW465	16.00	18.00	18.50	52.50	1.08	17.50	88%
NW060	16.00	17.00	17.50	50.50	0.62	16.83	84%
NW454	16.50	14.50	19.00	50.00	1.84	16.67	83%
NW254	16.00	14.00	18.00	48.00	1.63	16.00	80%
NW957	16.00	16.00	16.00	48.00	0.00	16.00	80%
NW378	18.00	13.50	16.00	47.50	1.84	15.83	79%
NW510	14.00	16.00	17.50	47.50	1.43	15.83	79%
NW281	15.00	15.00	15.00	45.00	0.00	15.00	75%
NW984	15.00	15.00	15.00	45.00	0.00	15.00	75%
NW691	16.00	12.00	14.00	42.00	1.63	14.00	70%
NW955	10.00	14.00	16.50	40.50	2.68	13.50	68%
NW531	11.50	13.50	14.00	39.00	1.08	13.00	65%
NW805	14.50	12.50	11.00	38.00	1.43	12.67	63%
NW107	12.00	13.50	12.00	37.50	0.71	12.50	63%
NW246	10.50	10.00	13.00	33.50	1.31	11.17	56%
NW065	10.00	9.00	10.50	29.50	0.62	9.83	49%
Mean	**16.22**	**16.07**	**16.78**	**49.07**	**0.85**	**16.36**	**82%**
SD	**2.97**	**2.94**	**2.62**	**7.98**	**0.64**	**2.66**	**0.13**

A summary of scores for each VMR category is presented in Table 6. Mean scores ranged from 3.14 to 3.38 out of a possible 4.00 for each category. The VMR category *Voice & Creativity* had the lowest mean score and highest variability (M = 3.14, SD = 0.69), while the *Ideas, Content & Purpose* category received the highest mean score (M = 3.38, SD = 0.55).

Table 6

Average VMR Scores by Category

VMR Categories	Mean Score	SD	Ratings			
			1 (Beginning)	2 (Developing - low)	3 (Developing - adequate)	4 (Exceptional)
Ideas, Content & Purpose	3.38	0.55	0	2	10	17
Organization & Structure	3.29	0.58	0	2	11	16
Voice & Creativity	3.14	0.69	1	3	12	13
Delivery, Visuals and Aesthetics	3.19	0.57	0	3	14	12
Technical Requirements	3.36	0.67	0	4	8	17

Table 7 shows mean VMR mean scores broken down by the demographic variables collected with the SVE. Comparisons were made between the first and second year students as a group and the third and fourth year students as a group, aviation/electronics majors and computer/digital media majors, traditional age and non-traditional age students, and gender. *T*-tests showed no significant differences based on demographic variables. The mean VMR scores ranged from a low of 14.67 for female students to a high of 16.95 for upper level (third- and fourth-year) students.

Table 7

VMR Scores by Demographic Subgroups

VMR by Year	n=	Mean	SD	T-test
1st / 2nd Year	16	15.88	3.06	
3rd / 4th Year	13	16.95	1.91	0.28
VMR by Major Group		Mean	SD	
Aviation / Electronics	11	16.73	2.88	
Computer / Digital Media	18	16.13	2.49	0.59
VMR by Age		Mean	SD	
18-24	15	16.89	2.49	
25+	14	15.79	2.69	0.28
VMR by Gender		Mean	SD	
Female	4	14.67	2.85	
Male	25	16.63	2.53	0.33

According to Hobbs' media-literacy framework (2011) described in Chapter 2, media literacy involves both analyzing and creating different forms of media. However, studies of media literacy (Arke & Primack, 2009; Ashley et al., 2012) often exclude the media-creation component of the media-literacy framework. Because this study did include a media-creation component (the video project), Pearson's *r* correlations were calculated to determine if a relationship exists between the two measurable constructs: 1) analyzing video as measured by the TAVV scores, and 2) creating video as measured by the VMR scores. Pearson's *r* scores were computed between the VMR and the pre-test, the post-test, and combined pre- and post-test TAVV scores for those students in the intervention group who completed both the TAVV and the video project ($n = 29$). As shown in Table 8, the coefficients are very small, suggesting a weak or nonexistent relationship between these measures (Fraenkel, Wallen, & Hyun, 2012).

Table 8

Pearson's r for TAVV Pre-test Scores, Post-test Scores, and Total Scores (total of Pre-test and Post-test Scores) VMR Scores for the Intervention Group

	TAVV Pre-	TAVV Post-	TAVV Total
VMR	0.09	-0.11	-0.01

Student Perceptions of the Video Project

At the conclusion of the video term paper project, students in the intervention group completed a survey on the project experience using the SP instrument (Appendix B3). Of the 29 students who submitted a video project for evaluation in the study, 25 students completed the SP survey, for an 86% response rate. The SP data obtained from the survey are presented in this section, and the raw scores can be viewed in Appendix D9. Students responded to each statement of the survey using a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). An overview of the results of the SP survey is shown in Figure 12. The mean scores for the statements ranged from a low of 3.20 to a high of 4.12, with most of the statement averages located in close proximity to 4.00. The highest scoring individual statement was for being more comfortable with using video-editing software (M = 4.12, SD = 0.82). The lowest scoring statement was for being more comfortable with using video cameras (M = 3.20, SD = 1.06. The statement with the greatest variability was "feeling like I accomplished something worthwhile (M=3.80, SD=1.20).

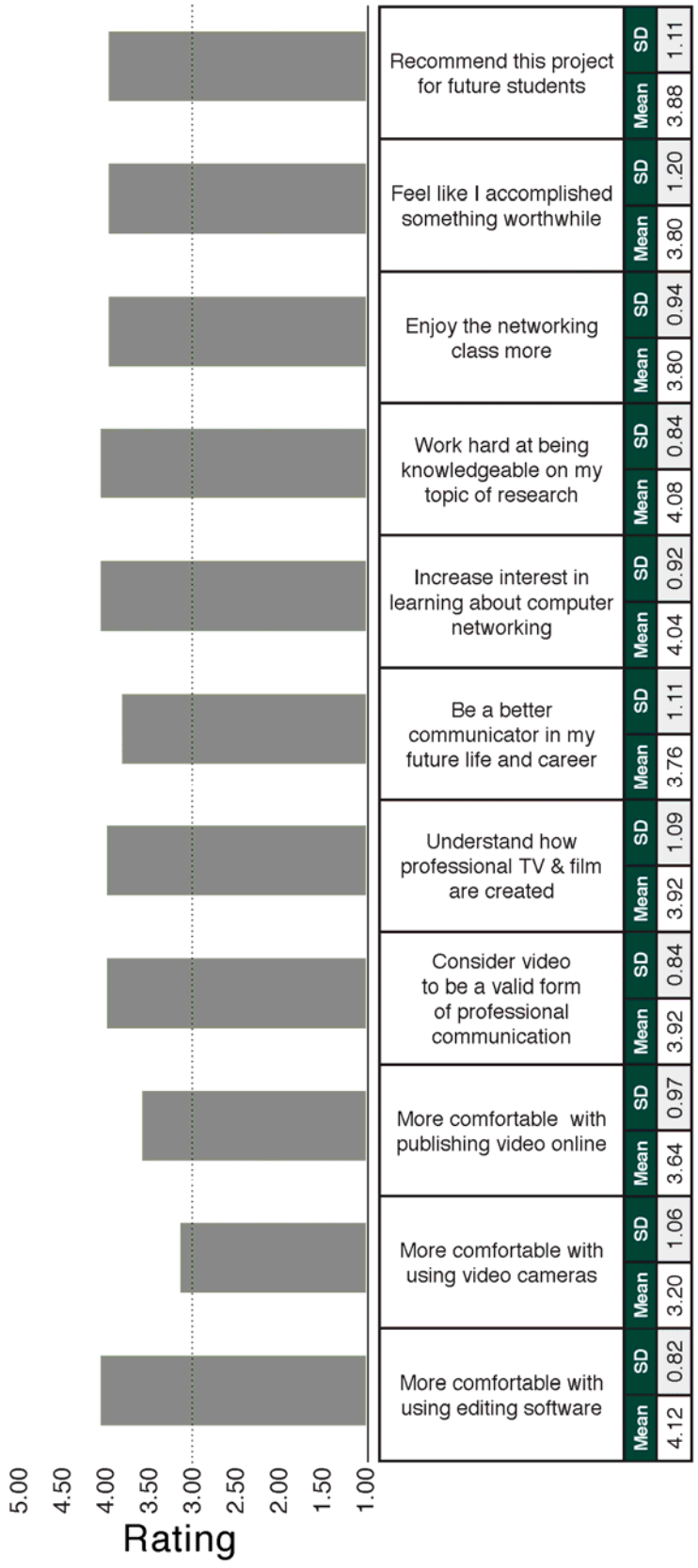


Figure 12. Student Perceptions of the Video Project

A scale for interpreting SP results is shown in Figure 13. This scale was divided into even thirds, with two cutoff points established for indicating agreement with a statement (> 3.66) or disagreement (< 2.33). Using this scale as a reference point, none of the mean student responses to the SP statements fell into the *disagree* category, while nine of the eleven mean responses to the SP statements (81.8%) fell in the *agree* category.

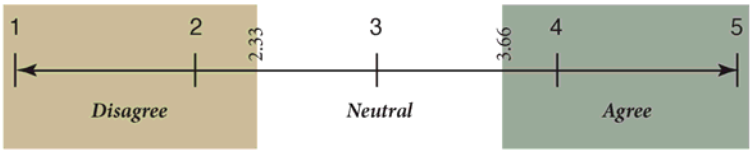


Figure 13. Likert Scale Interpretation of Student Responses to SP Items.

Categories of Student Perceptions

Although the SP instrument was not designed with particular categories in mind, its statements seemed to address three general categories of information: 1) video production, 2) communication skills, and 3) learning. Tables 9, 10, and 11 present the frequency distribution, means and standard deviations for the SP statements grouped into these three categories.

Table 9
Student Perceptions of SP Statements Related to Video Production Skills

Student Perceptions of **Video Production Skills**	**M**	**SD**	**Frequency of Each Rating**				
			1	**2**	**3**	**4**	**5**
Helped me to be more comfortable with using video editing software	4.12	0.82	0	1	4	11	9
Helped me to be more comfortable with using video cameras	3.20	1.06	1	5	11	4	4
Helped me to be more comfortable with publishing video online	3.64	0.97	0	3	9	7	6
Mean and SD of Video Production Skills	**3.65**	**1.03**					

Table 10
Student Perceptions of SP Statements Related to Communications Skills

Student Perceptions of **Communication Skills**	**M**	**SD**	**Frequency of Each Rating**				
			1	**2**	**3**	**4**	**5**
Helped me to consider video to be a valid form of professional communication	3.92	0.84	0	1	7	10	5
Helped me to understand better how professional TV & film are created.	3.92	1.09	1	2	4	9	9
Helped me to be a better communicator in my future life and career.	3.76	1.11	1	3	4	10	7
Mean and SD of Communication Skills	**3.87**	**1.02**					

Table 11
Student Perceptions of SP Statements Related to Learning

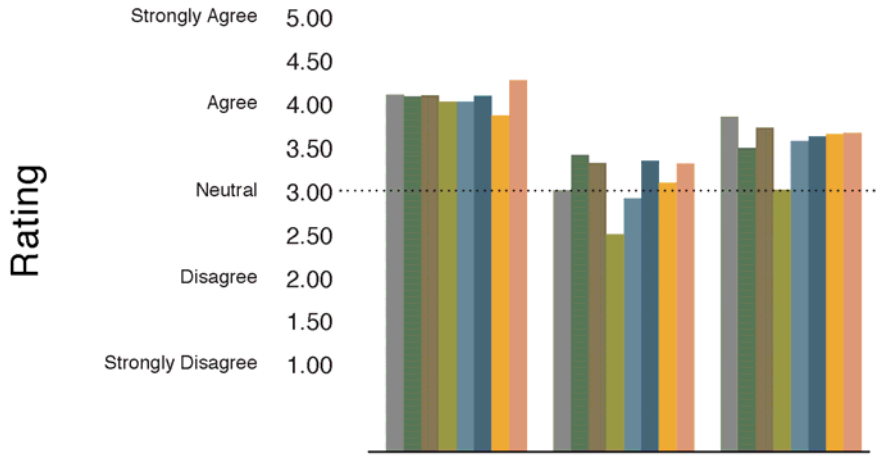
Student Perceptions of **Learning**	**M**	**SD**	**Frequency of Each Rating**				
			1	**2**	**3**	**4**	**5**
Helped me to increase my interest in learning about the subject of computer networking.	4.04	0.92	0	2	4	10	9
Helped me to work hard at being knowledgeable on my topic of research	4.08	0.84	0	1	5	10	9
Helped me to enjoy the networking class more	3.80	0.94	0	4	2	14	5
Helped me to feel like I accomplished something worthwhile	3.80	1.20	0	5	6	3	11
Helped me to recommend this project for future students in the class	3.88	1.11	0	5	2	9	9
Mean and SD of Learning	**3.88**	**1.02**					

Mean scores for each of the three SP categories were calculated by finding the mean of all scores for the statements within each category. As shown in Tables 9-11, these mean scores were: Video Production Skills (M = 3.65, SD = 1.03), Communication Skills (M = 3.87, SD = 1.02), and Learning (M =3.88, SD = 1.02). In general, students felt that the video project had been equally valuable in supporting learning and the improvement of communication skills but less valuable in improving their video production skill.

Student Perceptions by Subgroup

Averages for each SP statement were arranged according to subgroups of students by age, gender, year in college, and major subject area. Because the cell sizes of the freshmen students (*n* = 3) as well as electronics (*n* = 2) and digital media (*n* = 3) majors were small, the year in college

subgroup and subject major subgroup were collapsed into two categories each, as shown in Figures 14-16.

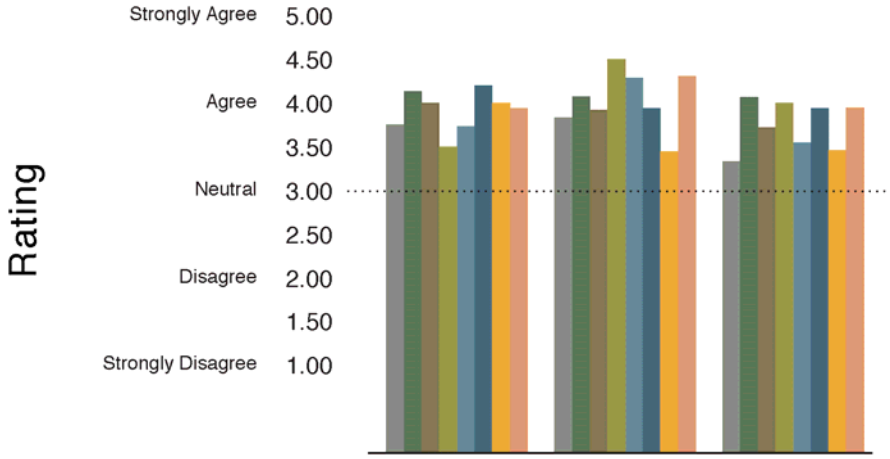


			More comfortable with video editing software		More comfortable with video cameras		More comfortable with publishing video online	
		N=	Mean	SD	Mean	SD	Mean	SD
Age	18-24	10	4.20	0.75	2.90	1.04	3.90	0.83
	25+	15	4.07	0.85	3.40	1.02	3.47	1.02
Gender	Males	23	4.13	0.85	3.26	1.07	3.70	0.95
	Females	2	4.00	0.00	2.50	0.50	3.00	1.00
Year	1st & 2nd Year	12	4.08	0.64	3.08	1.19	3.67	0.94
	3rd & 4th Year	13	4.15	0.95	3.31	0.91	3.62	1.00
Major	Aviation/Elect.	10	3.80	0.87	3.00	1.00	3.60	0.92
	Comp/Dig.Media	15	4.33	0.70	3.33	1.07	3.67	1.01

Figure 14. Student Perceptions of Video Production Items by Subgroup

Figure 14 presents the average scores for the three statements in the Video Production category, broken down by the demographic variables. As shown in Table 9, the video production SP statement "helped me to be more comfortable with video editing software" had the least variability among all the respondents (SD=0.82), while the statement "helped me to be more comfortable with using video cameras" had the most variability (SD=1.06). The subgroups contributing to this greater variability were 18-to 24-year-old traditional-age students, female students, first and second year in college, and aviation/electronics students. These subgroups agreed with "helped me to be more comfortable with using video cameras" less than did the other subgroups. Female students also rated the statement "helped me to be more comfortable with publishing video online" much lower than the other subgroups. To check for statistical significance, two-tailed unpaired *t*-tests were conducted between the subgroups in the categories

of age, gender, year in college, and subject major. No statistically significant results were found when examining the *t*-test results (Appendix D8).

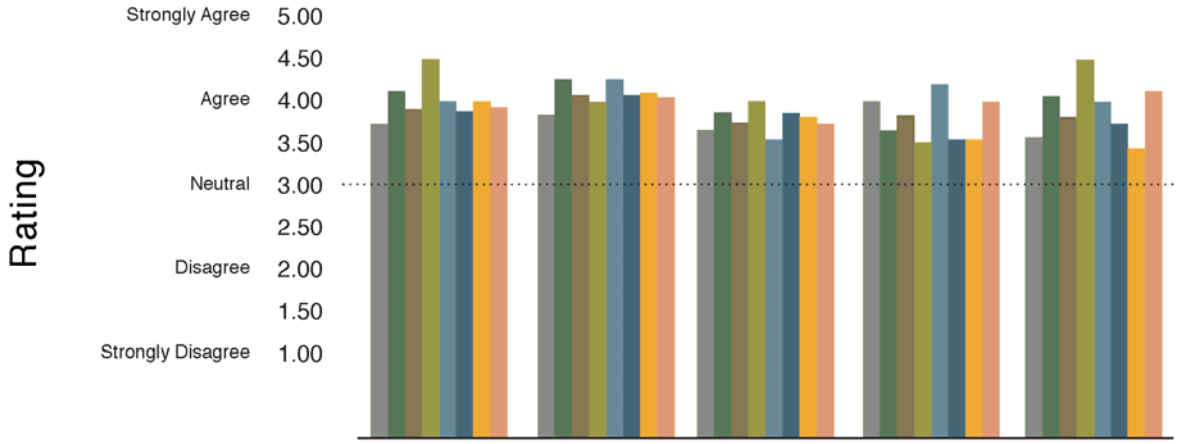


			Consider video a valid form of communication		Understand better how professional TV and film are created		Better communicator for life and career	
		N=	Mean	SD	Mean	SD	Mean	SD
Age	18-24	10	3.60	0.49	3.70	1.10	3.30	0.78
	25+	15	4.13	0.96	4.07	1.06	4.07	1.18
Gender	Males	23	3.96	0.86	3.87	1.12	3.74	1.12
	Females	2	3.50	0.50	4.50	0.50	4.00	0.00
Year	1st & 2nd Year	12	3.67	0.62	4.00	1.08	3.50	1.12
	3rd & 4th Year	13	4.15	0.95	3.85	1.10	4.00	1.04
Major	Aviation/Elect.	10	3.90	1.04	3.30	1.27	3.50	1.20
	Comp/Dig.Media	15	3.93	0.68	4.33	0.70	3.93	1.00

Figure 15. Student Perceptions of Communication Items by Subgroup.

Figure 15 presents the average scores for the statements included in the Communication category. As shown in Table 10, the communications item having the least amount of variability among all students in the intervention group was the statement "helped me to consider video to be a valid form of professional communication" (SD=0.84). The communications item with the greatest variability was "helped me to be a better communicator in my future life and career" (SD=1.11). The subgroups that scored this item lower than the intervention group as a whole included traditional-age students, males, first- and second-year students, and aviation/electronics students, contributing to its variability. Likewise, non-traditional-age students, female students, third- and fourth-year students, and computer/digital media students scored it higher than the intervention group as a whole. To check for statistical significance, two-tailed unpaired *t*-tests

were conducted between the subgroups in the categories of age, gender, year in college, and subject major. No statistically significant results were found (Appendix D8).



			Increased interest in learning about subject of computer networking		Worked hard at being knowledgeable in my topic of research		Enjoyed the networking class more		Accomplished something worthwhile		Recommend this project for future students	
		N=	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	18-24	10	3.90	0.70	3.80	0.87	3.70	0.78	4.00	1.00	3.60	0.92
	25+	15	4.13	1.02	4.27	0.77	3.87	1.02	3.67	1.30	4.07	1.18
Gender	Males	23	4.00	0.93	4.09	0.83	3.78	0.98	3.83	1.17	3.83	1.13
	Females	2	4.50	0.50	4.00	1.00	4.00	0.00	3.50	1.50	4.50	0.50
Year	1st & 2nd Year	12	4.08	0.95	4.08	0.95	3.67	0.85	4.17	1.28	4.00	1.08
	3rd & 4th Year	13	4.00	0.88	4.08	0.73	3.92	1.00	3.46	1.01	3.77	1.12
Major	Aviation/Elect.	10	4.10	0.94	4.10	0.94	3.80	1.17	4.10	0.94	3.40	1.11
	Comp/Dig.Media	15	4.00	0.89	4.07	0.77	3.80	0.75	4.00	0.89	4.20	0.98

Figure 16. Student Perceptions Learning Items by Subgroup

Figure 16 presents the average score for the statements included in the Learning category. As shown in Table 11, the learning item having the least amount of variability among all students in the intervention group was "helped me to work hard at being knowledgeable on my topic of research" (SD=0.84). The statement with the most variability was "helped me feel like I accomplished something worthwhile" (SD=1.20). The subgroups agreeing the least with this statement were non-traditional-age, females and third- and fourth-year students, while the subgroups agreeing the most were traditional-age, male, and first- and second-year students. All of the subgroups, except the subject major subgroups had standard deviations of 1.00 or higher, contributing to the statement's variability. The researcher conducted 2-tailed unpaired t-tests for

the statements in the Learning category; however, no statistically significant results were found (Appendix D8).

Student Perceptions Survey Summary

After completing the video project, the intervention group completed the SP survey. Average scores ranged from 3.20 to 4.12 on the five-point Likert scale. Student respondents indicated the strongest agreement with "more comfortable with using video editing software" and "worked hard on becoming knowledgeable on their topic of research" and the least agreement with "more comfortable with using video cameras." The statement with the most variability was "feel like I accomplished something worthwhile." The traditional-age- students consistently rated most of the SP statements below the average for all intervention group respondents, while non-traditional-age students rated most statements above the overall average. The only exceptions to this trend were the statements "helping me become more comfortable with video editing software," "helping me be more comfortable with publishing video on line" and "helping me feel like I accomplished something worthwhile." In the case of these three statements, the non-traditional-age students rated the statements lower and traditional aged rated them higher than the average for all intervention group respondents. The raw data table for the SP survey is located in Appendix D9.

Student Interviews

Interviews were conducted with nine students who completed the video project and who were volunteers recruited through in-class announcement and by e-mail. Everyone who expressed interest was interviewed. Of the nine students, two were non-traditional-age (25+) female students, four were non-traditional-age male students, and three were traditional-age (18–24) male students. No traditional-age female students were interviewed. Also among the interviewees were six computer majors, two aviation majors, and one digital-media major. In terms of year in college, one 1st year, five 2nd year, two 3rd year, and one 4th year were interviewed.

Interview Questions & Responses

The 20 questions from the interview protocol (Appendix B4) were grouped into three general categories: 1) technology, 2) communication and media literacy, and 3) learning and

engagement. Questions in the technology category explored how students completing the video project dealt with technological issues that they encountered, from learning to use video-editing software to managing the many different media asset files required to make a video. Even if students were unfamiliar with using video-editing software, having greater familiarity with basic computer operation was advantageous. Questions in the communication and media-literacy category investigated the ways in which the students felt the video project affected their ability to communicate their ideas effectively and to understand and interpret media created by others. Questions in the learning and engagement category examined how students felt about whether the video project helped or did not help with their learning of the networking course material, their engagement in the course, and their understanding of how communicating through video might be useful to them in the future.

Technology

Question #1: Describe your level of expertise using video-making software prior to this project.

The levels of experience described by the interviewees were categorized into four levels: 1) none, 2) minimal experience, 3) some experience, and 4) extensive experience. Five of the nine students interviewed had no experience with video-editing software, two reported having minimal experience, one student had some experience, and one student had extensive experience. Two of the five students without video-editing experience were not even viewers of online video content. “Until this class, none. I mean I had absolutely zero. I never even went to YouTube to watch a video.” Students with some editing experience described cursory contact with making video but were not deeply involved in the process. “A lot of stuff I did in high school where you just participated in making the video, I didn't do the editing. There's not much time where I really edited.” The one student reporting extensive experience had worked on video projects in school before. “I was multimedia editor-in-chief of (school name) TV. I founded their YouTube station. They went from having basically zero views. It was on a school TV. That was about it. To about 60 subscribers and over 8000 views in under a year.”

Question #2: How would you describe your level of expertise making videos now that you have completed the project?

While seven of nine interviewees started the project with either minimal or no prior video-making experience, eight of the nine reported that their skill had improved. One non-

traditional-age male student began the course with minimal computer skills and some concern about his ability to do the required work. He stated, “I feel comfortable with doing it. I mean if I had to, I could make one. I mean at first, when I try to do Vegas, oh my God where do I start? Most of my time was trying to get it to do what I wanted it to do.” A non-traditional-age female student also began with minimal computer skills. She said, “Interesting. It's amazing what I can do. Cutting and pasting. Taking not only from audio but video. I would say I'm not an expert but I would put it 5 on a scale from 1 to 10.” The student already confident with his video-creation skills did not report a change in his level of expertise.

Question #3: What technological challenges did you encounter while working on this project?

Two themes emerged: one concerning the loss of data and a second relating to the need to improve computer and video-editing skills. Of the nine interviewees, three mentioned having some sort of technical glitch that caused a loss of project data, and six mentioned needing to improve their skills with using a computer and/or the editing software.

One student who lost data was highly skilled with computers and was able to recover from the incident. He recalled,

> My laptop completely crashed. Yeah, blue screen of death. System 32 error. I had to reinstall Windows 8. That wasn't related to the video project. I had a virus or something. It was interesting. The virus attacked the partition table. I don't know how I got it. It was more of an annoyance than anything. I know how to solve technical stuff.

The other two students who lost data were among the six who also felt that they needed to improve their computer and software editing skills. Experienced computer users know that data loss is a real possibility, so they make multiple versions of important files, often saving copies on different back-up devices. According to one of the less-experienced interviewees,

> I spent probably eight hours on my project, and I lost my flash drive. So I learned to back it up. I've got an external hard drive now so I can back-up to it. When you said make a back-up in the lab, I just made a copy on the same flash drive. I never thought of losing my flash drive.

Comments related to computer and software skills described a lack of experience, suggesting that practice was helpful. As one student explained,

> This was my very first time using the software. I just had to explore a little bit, I guess, to figure out what I was doing. I didn't get my project saved right and exported it as an actual video file. That was confusing at first.

Question #13: Did you discuss this project with friends or classmates? Please describe those conversations.

Five students spoke with classmates, two students spoke with family members, and two students didn't have any conversations with family or friends about the project. A non-traditional-age digital-media student spoke with struggling classmates about the project. He observed,

> Several said this is impossible! And then every time they had a little stumbling block they just focused on that and the whole world, you know, it's all because it's new. And stuff they're freaking out on, I know there's no reason to freak out. Yeah just seems that they're sweating the small stuff. I try to help any time I can, with anybody.

One non-traditional-age computer student recalled a discussion with his spouse, who could not understand the level of commitment that was required to be successful in the project. He said,

> Oh, I discuss all of my homework with my wife. She was wondering why I was spending hours and hours on my computer. At first, her first response was, well why can't you just make the video and hand it in? And well, it's not like that. I need to add this picture and I need to add this. I mean it takes a lot to make up a video and she her response was, why don't you just shoot it one time and you're done? And she just couldn't get past getting into it like making a movie. She just sees the final picture? That's easy to do. No it's not! You're only making a two-minute video. Why are you spending 14 hours on it?

Question #16: What was the most difficult part of this video project for you?

Two major sources of difficulty came out of this discussion: 1) editing software and 2) doing the research. Six of the students mentioned the software, while three cited the research. One student mentioned both software and research. A traditional-age computer student said that learning the software was challenging. "Just the actual editing and putting it all together. I could find everything I wanted to put on there, I knew exactly what I wanted to say, it was just getting it all in...because I had never used it. I spent probably, maybe three or four days...Probably eight or so hours." A non-traditional-age digital-media student had problems with locating pictures of the computer pioneer he was researching, who lived prior to the invention of photography. He

said, “Finding enough visuals. It was kind of frustrating, always being portraits and no photographs. And there was only two or three... They didn't have a bunch. It was the same picture. Obviously they didn’t have very many.” An aviation student mentioned both the research and using the editing software as challenges. “Gathering the information to present, I think was one of the big challenges, gathering everything, but that could be because of the topic that I chose. One of the other challenges was finding a way to put it together in a meaningful way that would capture people’s attention. Again, a lot of that kind of comes back to my limited knowledge of the software.”

Communication and Media Literacy

Question #4: What strategies did you use to get the information, media assets, and scholarly references you needed to complete this project?

The sources mentioned in the interview were grouped into five categories: 1) Web/internet, 2) library, 3) online databases, 4) printed books, and 5) self. One student identified himself as the primary source of information used in his project, three students mentioned using the university-provided online databases for research, four mentioned reading printed books, six visited the library, and seven used other sources available on the Web. Four of the nine students interviewed mentioned using a combination of three sources (Web, library, and databases, or Web, library, and books), and one student used all four sources (Web, library, databases, and books). Four students reported using two sources; three of these four mentioned using the Web and another source, but none of them used the same two sources. One student mentioned using only one source, the library.

Students most frequently mentioned using the Web and the library. With seven of nine students interviewed, the Web was the most commonly used source. One student explained,

> I started by going to the W3C. That was my topic and I picked something that interested me on that website. And then I went to Google and I did some research which took me to another website. Well that website wasn't really what I wanted but I found some references on there which led me to another place where I wanted to go, so I kind of used that like for a reference.

Similarly, six of the nine students noted using the library for checking out books or interacting with staff librarians. A female student said,

> I went to see—I forget her name—in the library? Yes, [librarian's name]. She was the one I saw, so I was like, hey can you help me? She was like, oh you're doing the video. I was like yes, so she helped me get my sources. I know her because she helped me with my tech writing.

One of the four students who used books seemed to be impressed with that experience. One student noted that his book, although many years old, was in brand new condition. He said,

> I borrowed a book from the library which was pretty cool because it was from like 1987. Yes, it had hardly ever been used. It was only checked out about five times in the past 30 years. It was like in prime condition. That was pretty cool.

Question #5: How did you determine that you were using good, quality references and visual resources for your project?

The responses to this question were grouped into four distinct ways of determining the quality of information: 1) using a known reliable source, 2) being peer-reviewed, 3) self-knowledge, and 4) looking on YouTube for credible sources. Seven students used known reliable sources, two students cited peer-review as something important to look for, six students indicated that self-knowledge was important in getting good information, and four students mentioned getting information from YouTube.

Examples of known reliable sources used by the students include books, university databases, or credible industry websites. "Every time I found something I made sure it was from somewhere trustworthy, like the Microsoft website. That's trustworthy." Students specifically mentioned peer review, "Well I figured if it was peer-reviewed on the [library] website—if the library and told me this was a great place, that's where I should start." Some students mentioned self-knowledge skills, such as critical thinking. Two of the students in the self-knowledge category created their own original content. However, this "original content" was not necessarily truly original but based upon other videos that had been previously viewed on the topic. One student remarked that his work was credible

> …because they were movies that I'd watched before and knew the gist of the plot for most of that and understood what I was trying to do. Yeah I was just trying to convey the idea of transmitting information across the network using the computers to connect and all that stuff.

YouTube emerged as an information source in some answers to this question. Students used YouTube both as a search engine for locating credible sources and, sometimes, as a primary source of information. One student using YouTube as a search engine said, "Of course, I was searching on YouTube and I found the Fiber Optics Association, their actual entity. They have an actual institution so I looked up their website." However, another student using YouTube located a video interview of her research subject, Internet developer Leonard Kleinrock.

> Mine was a direct interview. So you could see the gentleman—I couldn't say his name to save my life—was it Leonard? [Kleinrock] And he was pretty much, you know it was a lot for me to pinpoint a certain part of his career.

Another student found quality information from printed sources but could not find usable video footage, so he created his own from scratch.

> So basically I figured once I got the information, I could start doing the editing, I borrowed a friends camcorder, I typed out a script, and he recorded me. I think he recorded me four times. And then when we got the four videos, what we did was we took part of this one and part of this one, part of this one. And then I was having trouble with the Internet and finding what I was wanting, so I just recorded myself.

Question #6 – How did you plan and work through the organization of your video project?

Seven of the nine students interviewed developed some sort of planning document to assist with the organization and planning of the video project. Two of these students made simple outlines, while five others developed a more complex planning document, such as an essay, script, or storyboard. Those who lacked planning documents and those who worked from simple outlines seemed to have more difficulty keeping their thoughts organized than did those who developed the more complex documents. Table 12 lists the video ID, VMR score, extent of planning as assessed by the rubric shown below, and extent of video experience as measured by the SVE for all nine students who were interviewed. In general, students who did not create a planning document or who made a simple outline received lower VMR scores for their videos than did students who made a more complex planning document, such as a storyboard or a script.

Table 12

VMR, Plan and Experience

ID	VMR	Plan	Experience
NW473	18.67	2	3
NW642	18.17	3	6
NW060	16.83	2	6
NW957	16.00	2	0
NW531	13.00	1	1
NW805	12.67	0	0
NW107	12.50	1	0
NW246	11.17	0	0
Mean	**14.88**	**1.38**	**2.00**
SD	**2.69**	**0.99**	**2.50**

Plan		Video Experience (Upload + Edit)	
0	No Plan	0	No Experience
1	Outline Only	1	1 - 2 times
2	Complex Plan	2	3 - 9 times
3	2 Complex Plans	3	10+ times

One non-traditional-age female student described the challenges of using her outline.

> I did an outline first and it was too much. And then it wasn't enough. [Too much for the time you had for the video?] Too much information, uh huh. And then I was like man, I'm doing too much. I'm just going to cut through this introduction to where he first began. I've got to get through that and then I had several skits from my kids. I used only one and then I went from there. They were playing on gadgets. You know how he [Leonard Kleinrock] was named the father of the Internet? And kids now days, you know how all they do—I just walked around the house with my phone, and they were either on the computer or their Android.

She shot video footage of her children to use in the project but ultimately abandoned the idea of including them. Another student who used only an outline found planning and organizing to be a challenge. When asked about his planning and organizing techniques, he said,

> That, I kind of struggled with. With my introduction and then from there, just kind of a basic explanation of what DHCP was. Trying to show a few examples, and then

from there I went into why is it important to us, and then the conclusion. I just kind of had a basic outline, and that helped a lot.

Two non-traditional-age students without planning documents simply organized the projects in their heads as they worked with the video-editing software. According to a male student, "I just took a bunch of clips and then I was like okay. And then I put it together. And then I went for what looked right to me." A female student, also without a planning document, explained her process,

> Well, I knew I wanted to start off with... Well he [Steve Jobs] started off with computers and so I wanted to follow his timeline and that was computers. I didn't do the iPod. I think the iPod was the second thing. But I wanted to do computers. And his iPhone and his iPad. Those are the three things that I felt that he made the greatest impact with. No, the kids would probably say the iPod was one of the best ones, but in my opinion. You see, I put on this Wondershare, [editing software] they had transitions you could use, and so I made up my own little transitions when I went from computers. And then the next one was the iPhone and I made up the transitions introducing the iPhone and seen [sic] that the other ones used transitions like that. And I thought it was a good idea, but apparently watching Monday's videos from the kids, maybe I shouldn't of [sic] done that.

She then said that she, "would have been a whole lot more comfortable writing a paper."

Of the five students having more complex planning documents, the one student with extensive video-making experience decided to create both a script and an essay. He said,

> I wrote it out. It was a script. I kind of turned it into an essay format. Then I changed it around so it would flow better with video. Sometimes essays don't really translate. Every sentence is followed by a pause and a picture. It would lead into the next sentence. I tried to keep everything connected.

Another student, a digital-media major, worked from a storyboard. He remembered,

> First I started out with the storyboard to determine how I was going to flow the video, was the first step I done [sic]. And of course I seen [sic] all that I had and what I was lacking. I was lacking big-time on the video portion of it. For the audio I just used my handheld thing, which I just love to use. I've got a little stereo one, so I do all of my videos using my Olympus and it works really good. But the video portion is where I had

to spend a lot of time and organize that. I did it through the storyboard. I didn't necessarily follow it but it gave me a good direction and a good plan.

Knowledge of basic computer operating system organization was also helpful in staying organized for the video project. One of the nine students described his use of the computer file system to organize content into related files and folders as an organizational strategy that supplemented his planning document script. He said,

> Everything went smoothly. When I told the computer what to do, it did it. Actually what saved me was my knowledge of directory structure in computers. I was able to say okay here's [sic] my videos and I put them here, and over here I'm going to put my audio. I'm going to put it here and kind of how I arrange all of that. Once I gathered everything I put it together fairly easily. I think some of the difficulty was sorting out the information that I didn't need.

Question #7: Who was your target audience? What approaches or techniques did you use to gain and hold your audience's attention?

Three students said their audience was everyone, while six students had a specific audience in mind for their videos. One of these latter six students hoped to inform a non-technical audience that regularly uses Dynamic Host Configuration Protocol (DHCP) each time a computer is turned on and connects to a network. The ideal audience for his video would be "somebody who had no idea what DHCP [networking protocol] was. It was designed to be able to explain what DHCP was and give them a little bit of an idea about how they could have been using it and didn't even know it."

There were four general techniques for holding audience attention that were identified in the interview commentary: 1) visual imagery, 2) music, 3) soliciting an emotional response, and 4) editing. Three students mentioned using some form of visual imagery, seven students mentioned using music, three spoke of using emotional response triggers, and three identified video editing as a way to gain and hold attention. While most students mentioned using multiple techniques, one student noted only a single attention-getting device: music. This particular student said that "most of what I did was I used the other people's voices to tell the story as it went through. Sometimes it would change over to the music a little bit or whatever."

Music and audio were the most commonly used attention-grabbers. "Transitions, background music, that kind of went with it. The background music made it seem kind of

dramatic." Students also used visual imagery that consisted of a number of things, such as still images, video clips, or special effects. "I had good visual animated visuals. And they are still visual, but I tried to get some glowing colors, blue and green. That's kind of my theme. I didn't apply transition special effects. I could've made these over-the-top, but I didn't." Some students tried to elicit emotional responses by showing vulnerable people such as children and the elderly. Others simply used familiar ideas to visually grab attention. "At the end I had a couple of different articles about young babies using the iPad, and the older people using the iPad for to help them out." At least one student seemed aware of the importance of pacing with editing. He stated, "Not leaving one slide for 25 seconds or more. I think that's what I held to in the video, because if you're looking at one thing for much longer than that, your brain starts to drift off. That's why I switched to the video clip of me talking, then maybe to a picture sequence."

Question #9: Having completed this project, have you noticed a change in how you view videos, television, or movies?

The responses were divided between those students who noticed changes and those who did not. Responses were fairly evenly split; five students were able to describe changes they have noticed, while four students reported no change in how they viewed media.

One non-traditional-age computer student observed a big change that was something like a switch being turned on in his mind. He felt that he now views the media with a more critical eye. He said:

> Watching the news and watching other things, it gets me to thinking how everybody's got an agenda. The news for example, I'm getting that newsperson's point of view. I'm not getting the truth. I'm getting his point of view. This project made me realize that. I mean you made—I'm saying you—but the class, the teacher made me look at the news differently. You as the teacher have. I mean what's going on behind the scenes. Whenever I look at commercials now, I kind of look at them differently—Yeah. What's making them get my attention? So there's a new computer coming on, it's a Dell. They are trying to sell it to me? What's getting my attention? Now I'm aware of it. Before I was not aware of that. Yeah it's just a switch that happened.

A traditional-age computer student agreed that the way he consumes media had changed.

> Yes. I can see a commercial on TV or something and I think about how much was actually put into doing that and that everything was put there for a reason. If you see

> something in the frame, that wasn't there by accident. You know they were trying to target something by doing that.

When asked if he thought in this way previously, he responded, “I did a little bit but not quite as much. I didn't know it went that far into detail.”

Two aviation students felt that they already had a level of awareness about how these forms of media can be used to influence an audience. According to a traditional-age aviation student, the project did not change his perception of various television, video, and film media. When asked if his media viewing habits had changed, he replied, “Not really. Because I've always been kind of critical of what I watch.” Another, non-traditional-aged aviation student added,

> Well I don't think it affected me too much. I kind of [sic] already had an idea of how it's used and why it's used to convey a message, and often, TV or video are used to do a different kind of impact. Whatever impact the creator would like to deliver, they can use the tools in creating that video to deliver that message.

Question #10: Do you find that you notice technical things like sound, lighting, camera angles, composition more?

Seven respondents provided at least one example of how they now notice these things, while two did not. A non-traditional-age aviation student compared his work to that of professionals.

> I do notice that, and that's why I wasn't very happy with my results, because those are very effective tools. Sound, lighting, different camera effects, and the different pre- and post-processing effects you can add to a video can really help to deliver your message.

Two of the students said that they did not notice these things.

Question #11: Do you pay more attention to story & plot development or other techniques used to gain and hold your attention?

Three students remarked that they did notice these things while six did not. Those who said “no” offered no additional comment or detail. A non-traditional-age male aviation student observed,

> Those are all very relevant, but I suppose it would depend on what angle you are trying to capture them from. If you're just seeking to inform somebody, it's not going to

have much of a plot. You're going to go through bullet points, or a process. Yes, it's very important. Because people respond well to a well organized, constructed point. They're not going to accept disjointed bits of information. So yeah I'd say it goes a long ways towards helping people understanding the message being delivered by this medium.

A non-traditional-age male computer student added,

> I always pay attention to plot. I like movies. I mean it made me think more. Part of it, I was looking for, but I just took it for granted. Now that my switch has been flipped I can't—I just look at it different now. I mean you got me thinking different and I can't stop.

Question #12: How has this video project experience affected how you perceive the media?

This question expands into how the students perceive the media in general. Seven of the students described ways in which the video project affected how they perceive the media, while two did not. A traditional-age computer student was the lone interviewee with extensive prior video-editing experience. He gave an example of how by using his new understanding of media, if he chose to do so, he could manipulate his own video messages recorded at the Boy's State convention through creative editing.

> I've never really thought along those lines, yeah. Things can be placed out of context really easily. It made me think a lot more about what could happen at Boy's State this summer. You could cut off a quote—But that's what they said. But it's not the full thing [laughs].

Learning and Engagement

Question #8: In what ways did the video project help you to learn course concepts related to computer networking and the Internet?

Six respondents were able to describe at least one way in which the project helped them learn about the content of the course, while three were not able to make a connection between the video project and learning in the course. A male computer student described how his project connected to Web server concepts: "Well for example, learning about the Internet and learning about port 80 and everything like that that links back to networking." A female computer student added, "Subnetting, packeting. deliverance... How information goes from point a to c through b. Where it needed to go." A male computer student suggested that the project itself was not helpful

to learning. He said, “It really didn't help me learn much. I already had a basic understanding of how the switch works. All I needed to do was to convey what I had learned in the course.”

Question #14: Describe your knowledge of your chosen topic before you began this project compared with your knowledge after completing it.

Responses were sorted into three categories: 1) one specific thing, 2) several examples, and 3) undecided or unclear. Two students came up with one thing that they learned about their topics, five students gave multiple examples of learning, and two students were unclear in terms of what they learned with the project. A non-traditional-age male computer student offered one thing learned by saying, “I learned that the engineers of the World Wide Web made this consortium to have standards for everybody to get onto the Internet. He wanted it to be available to everyone.” One traditional-age aviation student was not really clear about what he might have learned and why he learned it. He said, “I've always been interested in fiber optics but I've never spent enough time to research it. I figured I might as well get a grade to research it.” A non-traditional-age aviation student demonstrated learning by sharing how his research on the project could be applied in his future career, and how it gave him some new things to think about. He said,

> I now have a much stronger connection between this class and my chosen subject so I can see how it's applied in different areas. But this has definitely given me a new way to think about it and applying these concepts. When I made my career choice, I never thought it would be possible, or even conceivable to provide Wi-Fi to a country with an orbiting satellite that's not even in space, but it just sits there for months at a time broadcasting a Wi-Fi signal. Or never did I think that I could be walking to the park with an iPhone and some guy seemingly flying his little RC helicopter could be stealing my password and bank account information off of my phone.

Question #15: Do you feel like you could explain your topic to a friend who has limited knowledge of this area?

All the interviewees said yes, they could do this. A non-traditional-age male computer student said that he had already had some conversations like this.

> Yes I think I could do that very comfortably, because when I was talking to some of my friends they were like what is W3C? So I kind of had to explain it to them a little

> bit. To some of the kids, I tried to explain it to and they were like, yeah, whatever. But to me, it's a great topic.

A female computer student also observed, “Yeah, I would look like a expert now. I only know so much, but yeah...Oh, I know that guy! [Leonard Kleinrock] I know some facts about him, yes. Then I'd look really smart.”

Question #17: What part of the video assignment was most enjoyable?

Five mentioned that they enjoyed the process of editing, three said that the challenge was the best part of the project, and one student enjoyed doing the research. A female non-traditional-age computer student stated that editing was her favorite thing. “Being able to put them altogether. To build something I guess. I looked at the end project. I know it might not of been perfect, but I did it! I have never done something like that before. So I thought it was pretty cool.” According to one computer student, it was the challenge.

> The same things that made it challenging were probably the most enjoyable. Once I figured out how everything was going to fit, I had a plan for it and it was falling into place. It really was not terribly difficult, it was enjoyable.

Another computer student said, “The research. I like the research part. Learning something, for me, is enjoyable. My old teacher used to tell me, if you don't learn something, you're dead. You've got to learn.”

Question #18: As a future student in this class, would you be interested in viewing short videos online, like the one you created, as part of outside of class instruction? Why or why not?

Of the nine students interviewed, seven stated that they would be interested in viewing the videos created by other students; the other two were not interested in viewing those videos. A traditional-age computer student felt that the videos might be too long or easily ignored. He said,

> A YouTube video you can minimize. That's how I think about it. Like I will look at stuff in a book more than I will only on a monitor. I can usually tune out a video. Yeah, sometimes those subnetting [a complex networking concept] videos on the Internet can get really long. And they are like talking forever, and it's like a 20 minute video.

A traditional-age aviation student said that watching the videos of others would be helpful so long as the information was accurate and compelling. He said,

> Yeah, I think that would be helpful. That would be able to bring in the different learning styles to a classroom. The only thing would be to make sure that the videos were of solid content. Because if you got somebody that was super boring, talking to the screen forever, people would lose patience and zone out. The nice thing with videos, like with the tutorials I do at work, if I find myself drifting, I can back up which is almost easier than finding your place back on a page.

Question #19: What career do you hope to pursue? Will video-making skills like those learned in this project, be useful in the future?

Three students said yes, it would; two felt it would not be useful; and four were unsure. A non-traditional-age male aviation student was adamant that video skills were relevant in his field of unmanned aviation systems.

> I can tell you with 100% certainty that they will. We already do some video editing. We already use Premiere, After Effects and all sorts of neat stuff like that, but together in presentations, or sometimes to process data. So yes it will be very relevant to my career field.

A non-traditional-age male student said that video would not be used, "No, but it gave me insight." A non-traditional-age female computer student thought that perhaps it might be a useful skill: "Hadn't really thought about that. It could."

Question #20: Describe something about this assignment that surprised you.

Three students were surprised that they were able to learn how to make a video successfully. One of these three was also surprised that the media-literacy component was relevant and something she hadn't really thought about before. Three of the students were surprised at the difficulty of the assignment, and three felt there were no surprises. A non-traditional-age male computer student initially had some doubts about his ability to complete the video project.

> At first when you was [sic] telling me about this assignment I thought there's no way in heck I can do this, none. But, I did! I mean it surprised me that I did it, to be honest. I wasn't going to let this kill my grade.

Another traditional-age computer student was caught off guard by how challenging the assignment was: "I didn't really think it would be that difficult. The video idea is good. It definitely helped me. I always like to have that knowledge and I can make another one if I

wanted to." A traditional-age aviation student felt the assignment was straightforward without any surprises. "I wouldn't say anything. All of the requirements are there on the wiki." A female computer student said,

> At first I was like what does that have to do with networking? I get the content of what we were doing it on, but I was like what does this media have to do with? I wasn't upset. I was just like, I don't know how to do this! He never taught me, you know! But we did in class, and I was like okay. Yes, I'm like, how am I going to get this done? But it worked out. I was surprised at the media portion. I'm not really into the media, but I am. I was unaware of it, but now I am. I was like hmmm. And then we did the lab and that was fun. I'm proud of me!

Interview Summary

Some observations coming from the comments include: 1) confirmation that students were generally inexperienced with using video-editing software, but all of them learned to use it on some level; 2) learning the video-editing software was challenging; 3) a third of the interviewees experienced some form of data loss during the project; 4) students exhibited information-literacy skills while doing their research, with more than half using multiple, credible sources; 5) several students observed changes in how they perceive and view TV and video media; 6) some students saw a connection between this project and learning course concepts; and 7) some students saw the relevance of video in their future lives and careers.

Chapter Summary

Similar to what was noted in previous works (Kvavik & Caruso, 2005; Schmidt, 2013), students in this study reported having little prior experience with making and publishing online videos. Less than half of the students in the control and intervention groups have taken an academic course that required a video project. The results of measures of video media literacy before and after the video project intervention were not conclusive. The control group demonstrated a small decline in average TAVV score from pre- to post-test while the intervention group showed a small increase in average TAVV score. Neither of these changes were statistically significant.

Evaluations of the student-produced video showed the average score for *Ideas, Content & Purpose* to be the highest and *Voice & Creativity* to be the lowest. Responses to the SP survey

showed that intervention group students reported that after completing the video project they were more comfortable with using video-editing software and had worked hard on becoming knowledgeable on their topics of research. Additionally, they considered video to be a valid form of professional communication and had a better understanding of TV and film production techniques. Small differences between subgroups of students were observed, but none of these differences were statistically significant. Finally, interviews conducted with nine student volunteers from the intervention group confirmed that, while students were generally inexperienced with using video-editing software and it was challenging for them to learn it, every student ultimately was able to use editing software to communicate his or her ideas using digital video media. After completing the video projects, some students noticed changes in their perceptions of media, saw the video project as useful to learning course-related concepts, or understood the relevance of video as a communications tool for the future.

Chapter 5 - Data Interpretation and Recommendations

Introduction

The purpose of this study was to explore the impact of requiring a video term-paper project and media-literacy instruction in a non–media-related, college-level computer technology course to address the educational goals of increasing student ownership of learning, learning course-related concepts, providing evidence of communication skills, and increasing knowledge of key media-literacy concepts.

This exploratory work built upon the work of previous media-literacy scholars who explored ways to measure and quantify media literacy (Arke & Primack, 2009; Ashley et al., 2012; Hobbs & Frost, 2003), but it also followed the example of educators who have used video media assignments in college courses (Abulencia, Vigeant, & Silverstein, 2012; Jarvinen et al., 2012; Lichter, 2012; Ludlow, 2012). Most studies that measure media literacy exclude media-creation activities. This study was designed to measure media literacy of college students before and after a 45-minute instructional unit on media literacy as well as for an intervention group that completed a video project. Analysis of TAVV scores showed no evidence that the 45-minute instructional unit on media literacy had a significant impact on either the control or intervention group or that the video project had a significant impact on the students in the intervention group. Additional data gathered in the form of surveys and interviews with students in the intervention group indicated that, for many students, the video project was a challenge, was relevant, and engaged them in active participation in their learning.

Discussion of Results

Although Prensky (2001) popularized the concept of the youth as digital natives, educators who regularly work with young people and technology know that the generalization of all young people having extremely high levels of technological competence does not stand up to scrutiny. The literature suggests that the more complex and specialized the technology skill is, the less likely it is to be used, regardless of the user's age (Kennedy et al., 2008; Kvavik & Caruso, 2005; Purcell, 2010; Schmidt, 2010). The first research question explored the extent to which student participants had prior experience in producing digital video.

#1 – What level of experience with editing and uploading digital video online do undergraduate college students have, and what is the nature of that experience?

To measure the level of video-production experience among college students, the SVE was given at the beginning of this study (Appendix B1). A majority of the students reported having either minimal or no prior experience with editing or uploading digital video online. There were more non-traditional-age than traditional-age students with no prior video production experience (Tables 3 & 4). However, a majority of students, whether traditional-age or non-traditional-age, had limited levels of video-production experience (uploading or editing video fewer than three times.)

This lack of prior video-production experience among students was confirmed through interviews that were conducted with nine of the intervention group participants. A majority of the nine students interviewed had either little or no prior experience with making videos. An analysis of student responses to questions regarding technological challenges students experience led to the identification of two themes: 1) data loss, and 2) inadequate basic computer skills. Having basic computer skills, such as keeping backup copies of project files, is foundational to the advanced skill levels required for video production. That four of nine students interviewed encountered a loss of data—and only one knew how to recover their data without completely starting over on the project—adds additional evidence to the claim that students in this study had limited skills related to editing and uploading video.

Earlier studies of technological literacy of undergraduates (Kennedy et al., 2008; Kvavik & Caruso, 2005; Purcell, 2010; Schmidt, 2010) found that the greater the complexity of a technological tool or task, the less likely that particular tool or task would be used. While the results of the first research question were consistent with those findings, a greater percentage of students in this study had at least experimented with editing video or uploading video than that reported in earlier studies (Kennedy et al., 2008; Kvavik & Caruso, 2005; Schmidt, 2010). However, 70% to 80% of the students in this study had either no experience or limited experience (1 or 2 times) with editing video or uploading video online. In general, this research supports the conclusion that college students still have low levels of experience with editing video or uploading video online for others to see and that academic courses requiring video production tend to be rare.

#2 - In what ways does learning differ between students who create media while receiving media-literacy instruction and students who receive media-literacy instruction alone without creating any media?

Because of the lack of literature about how media creation supports learning media-literacy concepts, particularly in technology courses, a quasi-experimental design was used to investigate the second research question. The Test of Analytical Video Viewing (TAVV, Appendix B2) was the primary data-gathering instrument. In looking at the TAVV data, the researcher saw a slight increase in mean score (from pre-test to post-test) for the intervention group (23.46 to 23.50) and a concurrent decrease in mean score for the control group (25.00 to 24.00). One-tailed, paired *t*- tests conducted for each group (control: $p = 0.20$; intervention: $p = 0.48$) provided no statistically significant evidence that either the instruction on media literacy or the intervention of creating video projects improved the students' media literacy. It is possible that 45 minutes of media-literacy instruction was too little to have an impact on the TAVV scores. It is also possible that the TAVV instrument was not sensitive to changes in students' media literacy. A third possibility is that the technology topics selected by the students for their media-creation projects did not engage media-literacy skills as measured by the TAVV. Finally, a fourth possibility is that a single experience of video production was not sufficient to cause a measurable impact on media literacy. Overall, the data collected in this study did not provide convincing evidence that either a 45-minute instructional unit on media literacy and/or a single intervention of producing a video project had a positive impact on students' media literacy.

#3 – In what ways can "video term paper" projects and lessons in media literacy improve student engagement and ownership of learning, and how can these projects and lessons be used in non-media-based technology courses?

Student engagement and ownership of learning were explored through the Student Perceptions (SP) Survey (Appendix B3) and interview questions #13, #14, and #15. (Appendix B4). As supported by the mean scores on the five SP items selected as indicators of learning and engagement, student perceptions of the impact of the project and value for future students were positive. Overall, the data from the SP survey and student interviews provided evidence that the video term-paper project increased student engagement and "ownership of learning" for most student participants. The average Likert score for each item showed agreement with each of the

SP statements pertaining to learning. However, it cannot be said that agreement on the value of the project for learning was universal. That two students opted not to complete the assignment and accepted the accompanying grade reductions in the course is a concern and offers evidence to the contrary. However, similar to the 30% of student respondents in Kvavik and Caruso (2005), some students simply do not want to have technology integrated into courses that they take, particularly when that technology requires the active engagement that the assignment requires (Wesch, 2009b). Responses on the SP indicated that the non-traditional-age students agreed with the learning statements more than the traditional-age students did and the first- and second-year students agreed more than the third- and fourth-year students. With a few exceptions, the interview responses provided supporting evidence that the project was engaging and promoted ownership of learning. However, the interviews should be viewed with caution, as the sample of interviewees was self-selected volunteers and not randomly chosen from the intervention group. These volunteers were more likely to have a positive bias towards the assignment than randomly selected interviewees.

#4 - What are the perceptions of students who receive media-literacy instruction and complete a video project in a technology course?

Two main sources of data were used to answer this research question: the SP survey and the student interviews. The fourth research question has four subparts: learning about the subject, comfort with producing video, awareness of video-production techniques used by professionals in various formats, and awareness of the value and relevance of video to future lives and careers. These subparts are examined in the subsequent sections.

#4a - What do such students report regarding interest in learning about the subject?

All of the learning items on the SP survey had positive mean ratings. The student interviews provided some additional evidence of student learning and engagement relating to the video project. With 70% of the SP respondents indicating that the video project helped increase their desire to learn in the course and six of nine interviewees able to provide examples of their learning, there is evidence that a majority of students was engaged by this research project.

#4b - What do such students report regarding comfort with producing videos?

Students in this study agreed that the video project had "increased their comfort with using video editing software." This is demonstrated by the mean rating of 4.12 (of a possible

5.00) for this SP item, the highest of the ratings on the SP survey (Table 9). The interviews provided additional evidence that comfort levels with using the video-editing software had improved. Overall, the SP survey indicated that the students experienced increased comfort with using editing software more than they experienced increased comfort in publishing videos online (Figure 12 and Table 9).

A third item on the SP survey related to video production, asking respondents whether the video project "helped me to be more comfortable with using video cameras." This item was the lowest rated in the video production category, with an average SP score of 3.20—a neutral score that neither agrees nor disagrees with the statement. There were some possible explanations for the lower scores on this statement. First, video-camera technology has become a ubiquitous part of modern mobile phone technology; nearly every student now has access to a video-capable camera through his or her phone (Colley, Todd, White, & Turner-Moore, 2010; Madden & Lenhart, 2013; Purcell, 2013). Consequently, the video project assignment was not likely to introduce an unfamiliar technology (video cameras) that the students would be uncomfortable using. A second possibility is that students simply did not use any video cameras to create their video projects. Camera technologies were not discussed in any of the class instruction about completing the video term-paper project. Instead, students were shown how to create new videos through computer screen-capture software and how to download ready-made video clips from the Internet for remixing into their video projects.

Responses to the question of increasing comfort with tasks related to the production of video were mixed. A clear majority of students agreed that their comfort with using video-editing software had increased; however, responses were more mixed for using video cameras or uploading videos online. In general, student interviewees who had no previous experience with making videos noticed an improvement in their skill with using video-editing software after completing this project.

#4c - What do such students report regarding awareness of the video-production techniques used in the television programs, films, and videos that they view?

Evidence for answering this research question is found in the SP item "helped me to understand better how professional TV and film are created." In general, student participants felt that the video project did help them to better understand how professional television and film are created. Don Tapscott observed, in his 1998 book *The Net Generation,* that the coming

generation would be more skeptical of corporations and advertisements. This skepticism seemed to be evident in the student interview responses. Overall, students in the study did notice increased awareness in the video-production techniques used by professional media makers. It was the non-traditional-age students who seemed to be most affected by the video project and how it impacted their perceptions of video media forms.

#4d - What do such students report regarding awareness that such instruction and projects are valuable and relevant to their future lives and careers?

According to data from the SP survey, students in this study agreed that the project helped them consider video to be a valid form of professional communication (M = 3.92, SD = 0.84; Table 10). However, student responses in the interview were mixed with regard to the relevance of video in future careers. Those students with more life and work experience appeared to have a greater appreciation of the value of doing the video project.

#5 - In what ways do "video term papers" produced by students demonstrate evidence of communication skills and of learning course-related content?

The primary source of data regarding the video projects came from the Video Maker's Rubric (VMR; Appendix B5). Additional evidence used to answer this research question came from a student perceptions (SP) survey and student interview questions. While the VMR rubric was developed based upon rubrics for written communication, some of its categories overlapped more with written communication than others.

The mean VMR score (of the 29 videos evaluated) was 16.36 (82%) of a possible 20.00, indicating that on average student performance in creating the video fell in the 'developing–adequate' level. The students themselves indicated on the SP survey that they felt the video had helped them to become better communicators for their future life and career.

Of the five VMR categories, the category of Ideas, Content, and Purpose measured how effectively students communicated the course-related content in their videos. The average score for this category was 3.38 (SD = 0.55) of a possible 4.00, which was the highest overall score of all the VMR categories (Table 6). The next highest scoring VMR category was Technical Requirements (M = 3.36; SD = 0.67). These category ratings reflected student ability to communicate ideas related to their research topics, along with the ability to meet the technical requirements for how the video should be constructed and presented. While a majority of

students interviewed felt that completing the video project had helped them to learn course-related content, it didn't necessarily meet all of their expectations to that end. It may be that completing a research project from a wider range of topics such as a notable persons and events, rather than simply about specific course-related technologies, made the assignment seem less relevant to learning the course content. The lowest-rated VMR categories were Voice and Creativity (M = 3.14; SD = 0.69) and Delivery, Visuals, and Aesthetics (M = 3.19; SD = 0.57). These category ratings provided evidence of lower student competence with making effective use of the video medium. These findings are consistent with Juhasz's work (quoted in Jenkins, 2008), which stated that students were more proficient with communicating through writing than with using the video medium.

While there were some exceptions, the data collected in the study suggest that the video term-paper project provided evidence for improving communication skills and for learning course-related content. The VMR category Ideas, Content, and Purpose received the highest overall ratings from the assessment team of experts, suggesting that the course-related content part of the assignment was one of its strengths. The students themselves agreed (via the SP survey) that the project helped them to become better communicators, that they had worked hard at learning their research topic, and that the video project increased their interest in learning about computer networking. In addition, the majority of students interviewed stated that the project had helped them to learn course-related content, although some did not see that connection.

An interesting piece of evidence regarding communication skills emerged in asking interview question #6, "How did you plan and work through the organization of your video project?" By asking this question, the researcher learned about the importance of creating planning documents for student success in the project. Students were encouraged to create outlines, scripts, and storyboards; however, there was no requirement to do so. The researcher posited that students with more experience in video production might create complex planning documents, even without an assignment requirement to do so. However, among the students interviewed, the top VMR score went to a student having less prior video experience than some other students.

While some distinctive characteristics of using the video medium such as creativity and aesthetics were rated lower than some more generally applied areas like ideas, content and

purpose on the VMR, the data collected in the study provided overall evidence of communication skills and learning course-related content. The students indicated in the SP survey data that the video project had helped them to improve their communication skills and better understand video as a tool for communication (Table 10). The measure of the student video projects through the VMR assessment (Table 6) and the student interviews also provided evidence for learning of course-related concepts and demonstrating communication skills.

Limitations, Recommendations for Future Research and for Practitioners

Study Limitations

The design of this exploratory study limits the extent to which the conclusions can be generalized to other populations. The samples were small and were samples of convenience. The students interviewed were volunteers and cannot be considered representative of the intervention group. The results of the study should not be generalized beyond the context of the branch campus and course characteristics from which participants were drawn. While the control and intervention groups were similar in some ways—mainly, the participation of first- and second-year undergraduate students attending classes on the same branch campus—there were a number of differences as well. A future study would benefit from a larger sample using randomly selected equivalent groups of technology students.

Another limitation of this study was the broad variety of topics that students chose for their video projects (Appendix A), making it difficult to quantify the learning that took place on specific course-related subjects. Previous studies, such as Lichter (2012) and Ludlow (2012), had narrow ranges of topics that were directly tied to course-learning objectives that could be measured in course assessments.

The length of the intervention may have been too short to result in significant changes in students' knowledge of video literacy. The quasi-experimental design utilizing the TAVV instrument and the video-project intervention were conducted over a two-week period. It may be that one single experience of video production was not enough to cause a measurable impact on media literacy.

Future Studies

While new forms of digital media communication technologies are emerging, apart from traditional media and communications subject areas there is currently a lack of information about how to teach communication skills using these new media technologies. This study explored the development of student communication skills through the use of media literacy instruction and video term paper research projects in a computer technology course. Overall, this approach to teaching communication skills was successful, but not without raising additional questions for some possible future research.

The previously discussed limitations of this study suggest some modifications that could be made in future studies. As previously mentioned, a future study would benefit from larger sample sizes with equivalent groups. While there was some anecdotal evidence from the interviews that the video project improved some students' understanding of the media and learning elements of the course material, statistical evidence from the pre- and post-test measures was not present. Therefore, the role of media creation for learning course material as well as for learning media literacy concepts is still an open question for further study. One way to explore this question further would be to implement a research design that utilizes multiple media-creation activities over a longer time period, providing more encounters with media construction techniques and more opportunities for learning course related material. Some other projects (Jarvinen et al., 2012; Lichter, 2012) had a limited number of topics about which students could develop videos. A future version of this study might also implement a smaller list of acceptable research topics more closely tied to course-learning outcomes, increasing the sensitivity of measures of course-related learning that occurred as a result of the video projects.

In this study, some student participants in the intervention group completed some of the surveys but did not actually submit completed video projects—an integral part of the research. These students were otherwise active participants in the class and earned A averages on course examinations but took zeroes on the video term-paper assignment, which adversely impacted their final grade. The video was a requirement for the course; not completing it had the same effect as missing a semester examination. It appears that these students were similar to the 30% of students in Kvavik and Caruso (2005) who did not want technology integrated into courses. However, the factors involved in these students opting out of the project to the detriment of their final grade are still unknown. It would be helpful in a future version of this study to interview

any students who elected not to complete the video project to learn about why they made that decision.

One of the strengths of using digital media in student projects is its applicability to all subject areas. Educators in STEM fields have begun to adopt professionally created interactive and multimedia presentations in their instruction, but having students themselves develop these presentations still seems to be in its infancy. Future studies might investigate the use of video projects in other STEM courses. The researcher found examples of student-made video projects in courses on neuroscience, chemistry, and chemical engineering (Jarvinen et al., 2012; Lichter, 2012; Ludlow, 2012). However, it would be interesting to see how student-made video projects could be integrated into subjects such as mathematics, physics, or a range of other STEM areas that are yet to be explored. Such studies of STEM courses could change the content of the videos used for a TAVV measurement of media literacy to investigate how STEM students respond to videos having science and technology themes, such as environmental catastrophes, bioethics, or space exploration. While it could still be used to practice media literacy, such an assignment would also encourage engineering thinking described in Irish (1999).

Using video projects in other subject areas could be examined as well. A future study might compare traditional written term papers and the alternative form of literacy represented by video projects, exploring the similarities and differences as well as strengths and weaknesses between the two formats. One approach to implementing such a comparative study would be to introduce video production into English or Language Arts courses involved in media literacy studies that currently lack a media production component. One of the reasons behind requiring online publication for the video assignment was to push students to put their work out in the public eye, in hope of motivating them to do their best, as Bogush's students were motivated when writing for an online audience (Bogush, 2008). It is unclear if online publication was a motivating factor for students in this study. Future studies could investigate more deeply the student perceptions of publishing video online.

Recommendations for Practitioners

For the researcher in this study, it was a pivotal discovery that media literacy education and media-creation projects can be applied in any academic area. Prior to this discovery, the researcher taught media creation primarily through emphasis on learning the software tools.

However, through discovering media literacy theory, such assignments can now include more critical thinking about the media and students can begin to understand that all media are created, that media authors have an agenda such as gaining influence or earning a profit, that different people understand media messages differently, and that professional media makers use proven techniques for gaining an audience's attention.

If Elizabeth Daley (2003) is correct in her argument, the language of the screen is becoming the vernacular of our culture. While some scholars (Burniske, 2008; Goodman, 2003; Hobbs, 2011) suggest that all students can and should learn media-creation and media literacy skills, there is little evidence suggesting that this sort of learning is commonplace in higher education outside of fields already traditionally associated with making and understanding media. This is unfortunate because media heavily influences our culture. Students who lack practical knowledge of how media is created have less of an understanding of the media they consume and less of a participatory voice in the culture.

Multi-media projects such as the video term paper project in this study engage the senses, and offer broad appeal to a variety of learning preferences beyond those of traditional written assignments. Not only did students in this study read about their topics of research, they also could *see* and *hear* about these topics as well. It is one thing to read about the work of a notable computer scientist; it is quite another to actually see and hear him speaking about his inventions. As Daley (2003) suggests, the multimedia language of the screen communicates differently than traditional printed text. Because video projects are complex, they can challenge novice and expert students alike, engaging them at their respective levels. Beginners feel a sense of accomplishment at creating and publishing their first video, while those with more experience can hone the aesthetic and storytelling aspects of their work. As one student in the study observed, this was not a project that could be completed the evening before it was due. The video project requires a sustained effort over a longer period of time. It demands attention, patience and persistence—attributes that Carr (2008) believes are weakening. These projects invite students to examine and participate in the culture, acknowledging and embracing the changes brought on by the digital age by widening the focus from strictly textual to a broader view of literacy.

Higher education practitioners should consider introducing "writing with video" as part of college general education as does the University of Illinois at Urbana-Champaign (Avery,

2007). The faculty of college-level English departments that teach writing and rhetoric typically do a good job with regard to critical thinking about or *reading* multimedia messages, however they are less familiar with how to go about *creating* multimedia messages. Additionally, instructors of media creation often emphasize the technical elements of creating media messages, but tend not to emphasize the reading and analysis of such messages. To complete a full picture of literacy, one must be able to both read and write, so the researcher recommends that where possible, faculty members teaching writing and rhetoric collaborate with those who teach media creation. This combination could then join with experts from nearly any other field to create interdisciplinary teams for the purpose of teaching new media literacies in any subject area.

Educators in STEM fields should consider doing student-made video projects in science, technology, engineering and math courses by forming these interdisciplinary partnerships with experts in communications. This study benefitted from an interdisciplinary team having expertise in computer systems and communications. Using assessment rubrics for written communications, the team developed a new rubric for assessing the video projects. By forming these interdisciplinary teams of educators for the purpose of assigning and assessing communications projects, concerns about having a lack of expertise can be alleviated. The examples provided by other STEM educators such as Jarvinen, Lichter and Ludlow encouraged the researcher in this study that such media projects *can* be successful endeavors (Jarvinen et al., 2012; Lichter, 2012; Ludlow, 2012).

Although most STEM educators recognize the need for emphasis on communication skills, they typically do not attempt to include communication-oriented projects in their courses (Dansdill et al., 2008). Even traditional assignments such as written term papers appear to be in decline in STEM courses. However, as one of the students interviewed in this study stated, the video project "got me thinking and I can't stop." Hearing a student saying these words is every educator's dream! It is the very purpose of formalized education, and it happened through the use of a media literacy project incorporated into a STEM course. Video assignments may be a viable, technology-based alternative to traditional writing assignments for any STEM course. As more STEM educators begin to explore this form of assignment and share their results, we will learn more about what techniques are effective.

One specific recommendation to offer practitioners from the results of this study is to ensure that media-creation assignments include a planning document such as a script or a

storyboard as a required component. Those students in this study having prior video-making experience seemed to recognize the value of such documents, while those without prior experience frequently omitted it. Typically, an outline is required for written assignments, however having only an outline for the video project seemed to be insufficient. This may be due to the extra complexities of multimedia compositions that require sound and visual elements in addition to a narrative. The students in this study also seemed to benefit from the in-class support that was provided for learning the video editing software as well as for techniques and approaches to effective video-making. As Greene & Crespi (2012) discovered, students without any support in their video-making efforts tend to either really like or dislike doing these projects. The more scaffolding support that can be provided in the form of equipment, software demonstrations, and technical assistance outside of class, the better the results will be. It cannot be assumed that because students are avid users of technology that they can easily master video production on their own.

One group of students that consistently seemed to appreciate and benefit from the video project was non-traditional age students. These students noted improvements in their video-making skills as well as their perceptions of how professional TV and film are made. Students with more maturity and work experience appeared to have a greater appreciation of the value of learning these digital video tools and techniques. Teachers of adult learners should take note that while these students may not have the reputation for technological prowess that the younger students have, they were still able to be successful and recognized the benefits of doing the video project. Regardless of age, the student participants in this study recommended that the video project was worthwhile and should be continued in the future.

Educational institutions, particularly those in higher education, are far from being widely accepting of digital media technologies as new tools of literacy. While we are beginning to see the adoption of these digital tools for developing communication skills in some disciplines, they are still unfamiliar to a great many educators in a variety of academic areas, providing a wide-open area for future experimentation and study.

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Appendix A - Networking 1 Video Project Topics

The following topics are provided to students in the Networking 1 course for making videos. Students may select a topic from this list, or propose a new topic that can be approved by the instructor. The topics that were selected by the students in this study are highlighted:

Networking Equipment Routers Switches Hubs NICs Fiber Optics UTP WiFi Cable Modems Satellite Connectivity Topologies (Ring, Bus, Star) DSL Peer to Peer Client/Server FTTH Networking Protocols & Applications TCP/IP DHCP NTP DNS FTP Telnet HTTP History & Growth of the Internet ARPANET W3C IEEE World Wide Web Broadband access Mobile computing Wearable computing Telegraph Issues in Networking Wireless Security Network Security DDOS Attacks Wardriving Hacking Spam/Botnets Social Engineering Social Networking Convergence Creative Commons Legislation affecting the internet (SOPA/PIPA) Piracy & Intellectual Property Copyright Online Privacy UAVs and Networks Living a Digital Life	Other Networking Topics IP V 6 Web 2.0 Arduino Bluetooth E-commerce Voice over IP Open Source Software Unix Apache Linux Firewalls Binary Numbering System New Developments in Computer Networks OSI Model overview Physical Layer Data Link Layer Network Layer Transport Layer Session Layer Presentation Layer Application Layer People Aaron Swartz Ada Lovelace Alexander Grahm Bell Bill Gates Bill Joy Bob Kahn Eric Bina Jack Kilby Leonard Bosack & Sandy Lerner (Cisco) Leonard Kleinrock Linus Torvaalds Louis Pouzin Mark Andreeson Mary Kenneth Keller Nicolai Tesla Paul Baran Paul Otlet Samuel Morse Steve Jobs Steve Wozniak Tim Berners-Lee Vinton Cerf	Internet & Computer Companies/Organizations Google Microsoft Sun Microsystems Yahoo Mozilla YouTube Facebook How Tos How to set up a gaming LAN Multiplayer gaming networks How to set up Home Networks Airborne Communication Networks Book Review Alone Together by Turkle Here Comes Everybody by Shirky How to Win Friends and Influence People in the Digital Age by Carnegie Singularity is Near by Kurzweil Smarter than you think by Thompson The App Generation by Gardner & Davis The Shallows by Carr The Wealth of Networks by Benkler The World is Flat by Friedman Tubes by Blum

Appendix B - Data Instruments

B1 – SVE Survey of Video Experience

Anonymous Participant Code:

Survey of Video Experience

Completing and returning this anonymous survey implies that you give your informed consent to participate in a research project with the aim of improving college classroom instruction. This implied consent consists of the following statement: "I understand this survey is for research, and that my participation is completely voluntary. I understand that my participating or not participating in the survey involves no penalty, or loss of benefits, or academic standing to which I may otherwise be entitled."

(Please circle one from each category or question)

Demographic information

1) Age Range: 18-24 / 25+

2) Gender: male / female

3) Year in college: First-year / Sophomore / Junior / Senior

4) Academic Major: CMST-Computer Systems / CMST-Digital Media
Electronics-Comp. Eng. / Aviation-UAV / Other _____

Prior experience with video production (before doing this class project)

5) I have taken a college class that required creating video content: yes / no

6) I have taken a middle or high school class that required creating video content: yes / no

7) I have uploaded a video online for others to watch: never / once or twice / 3 - 9 times / 10+ times

8) I have used video editing software (e.g MovieMaker or iMovie) to create an edited video:
never / once or twice / 3 - 9 times / 10+ times

B2 – TAVV Test of Analytical Video Viewing

I am in the (circle one) **Expos1** / **Net1** class. Anonymous Participant Code: [ ]

Test of Analytical Video Viewing

Completing and returning this anonymous survey implies that you give your informed consent to participate in a research project with the aim of improving college classroom instruction. This implied consent consists of the following statement: "I understand this survey is for research, and that my participation is completely voluntary. I understand that my participating or not participating in the survey involves no penalty, or loss of benefits, or academic standing to which I may otherwise be entitled."

Please answer the following questions about the video: **Video Name Here**

1.) Who is the sender of this message? From where did the information originate?

2.) In a sentence or two, describe the main message of the video using your own interpretation.

3.) Are there other possible interpretations of this video's main message? If so, provide an example of how others might interpret the main message.

4.) Who is the target audience of this video? From the perspective of the video's creator, describe the ideal characteristics of viewers of this video.

5.) What specific techniques are used in this video to attract and hold your attention?

6.) What is the purpose of this video? Check all that apply:

___ to inform ___ to entertain ___ to persuade

___ for self-expression ___ to make money ___ to teach

___ to gain power or influence

B3 – SP Student Perceptions Instrument

Anonymous Participant Code:

Student Perceptions of the Networking 1 Video Project

Completing and returning this anonymous survey implies that you give your informed consent to participate in a research project with the aim of improving college classroom instruction. This implied consent consists of the following statement: "I understand this survey is for research, and that my participation is completely voluntary. I understand that my participating or not participating in the survey involves no penalty, or loss of benefits, or academic standing to which I may otherwise be entitled."

Using the scale: **1**: Strongly Disagree **2**: Disagree **3**: Neither Agree nor Disagree **4**: Agree **5**: Strongly Agree

Please rate the following statements: (circle one number for each question)

Completing the Net1 Video project has helped me to:

1) be more comfortable with using video editing software.	**1**	**2**	**3**	**4**	**5**
2) evaluate the quality of information from a variety of sources	**1**	**2**	**3**	**4**	**5**
3) be more comfortable with publishing video online for others to see	**1**	**2**	**3**	**4**	**5**
4) consider video to be a valid form of professional communication.	**1**	**2**	**3**	**4**	**5**
5) learn about the impact and function of computer networks.	**1**	**2**	**3**	**4**	**5**
6) work hard at being knowledgeable on my topic of research.	**1**	**2**	**3**	**4**	**5**
7) enjoy the networking class more.	**1**	**2**	**3**	**4**	**5**
8) understand better how professional TV & film are created	**1**	**2**	**3**	**4**	**5**
9) be a better communicator in my future life and career.	**1**	**2**	**3**	**4**	**5**
10) feel like I accomplished something worthwhile.	**1**	**2**	**3**	**4**	**5**
11) recommend this project for future students	**1**	**2**	**3**	**4**	**5**

B4 – Interview Protocol & Questions

Interviewer: Participant Name:

Student Video Production Interview Protocol

Introduction

Thank you for agreeing to participate in this interview. To ensure we have good records of our conversation, I would like to make an audio recording to supplement my note-taking. Only the researchers involved in this study will have access to the recordings and they will be destroyed after being transcribed.

We will need your written consent to continue with the interview. This consent form (hand form to interviewee) states that this interview is for research, that your participation is completely voluntary, and you may stop the interview at any time for any reason. We do not intend to cause you any harm. Participating or not participating has no penalty or impact upon your academic standing.

This interview is designed to take no more than one hour. Please answer the questions to the best of your ability. If we appear to be running short of time, I may interrupt and push ahead to move the interview forward.

Interview Questions

1. Describe your level of expertise using video making software prior to this project.

2. And how would you describe your level of expertise making videos now that you have completed the project?

3. What technological challenges did you encounter while working on this project?

4. What strategies did you use to get the information, media assets, and scholarly references you needed to complete this project?

5. How did you determine that you were using good, quality references and visual resources for your project?

6. How did you plan and work through the organization of your video project?

7. Who was your target audience? What approaches or techniques did you use to gain and hold your audience's attention?

8. In what ways did the video project help you to learn course concepts related to computer networking and the Internet?

9. Having completed this project, have you noticed a change in how you view videos, television, or movies?

10. Do you find that you notice technical things like sound, lighting, camera angles, composition more?

11. Do you pay more attention to story & plot development or other techniques used to gain and hold your attention?

12. How has this video project experience affected how you perceive the media?

13. Did you discuss this project with friends or classmates? Please describe those conversations.

14. Describe your knowledge of your chosen topic before you began this project compared with your knowledge after completing it

15. Do you feel like you could explain your topic to a friend who has limited knowledge of this area?

16. What was the most difficult part of this video project for you?

17. What part of the video assignment was most enjoyable?

18. As a future student in this class, would you be interested in viewing short videos online, like the one you created, as part of outside of class instruction? Why or why not?

19. What career do you hope to pursue? Will video-making skills, like those learned in this project, be useful in the future?

20. Describe something about this assignment that surprised you.

Conclusion

This concludes all of the quesions that I have for you. Do you have any additional comments you would like to share about the video project, or questions I can answer about this research?

Thank you again for agreeing to participate in this interview.

The Video Maker's Rubric

Video Title: _____

Anonymous Participant Code: _____

Video Element	1 - Beginning	2 - Developing - 3	Exceptional - 4	Score
Ideas, Content & Purpose	Limited or no clear purpose. Limited or no evidence supporting ideas and opinions presented. Ideas are irrelevant to the topic.	Purpose is implied, but may not be overly clear. Some ideas are supported with evidence; others are opinions. Relevant ideas, but may have irrelevancies.	A clear purpose is evident with ideas explicitly relevant to the topic. Ideas presented are supported with logical evidence citing authoritative sources.	
Organization & Structure	Information presented at random. Lacks an introduction or concludes abruptly. Missing evidence of thoughtful organization.	Somewhat organized. Ideas are beginning to be connected and flow from one to another, but still rough in places. Pacing sometimes too fast or slow.	Excellent organization having a clear introduction, body, and conclusion. Conceptual transitions flow smoothly from one to the next. Well paced.	
Voice & Creativity	Borrows heavily from the work of others offering no new insights. Unimaginative presentation of ideas.	Beginning to find an original voice, but still quite dependent on others for presentation of ideas. Shows some moments of creativity.	Imaginative presentation of ideas. Shares information in an interesting way that is thoroughly compelling to the viewer.	
Delivery, Visuals & Aesthetics	Lacks sophistication in use of color, lighting, visual composition, music, narration or sound levels. Does not use the video format well.	Shows attention to visual presentation, however having some problems with color choices, lighting, composition & visuals, or sound levels.	Demonstrates sophisticated use of color, lighting, visual composition, scene transitions, music and sound. A pleasurable experience to watch.	
Technical Requirements	Fails to meet length or resolution requirements. Not published in the required format. Ignores copyright laws.	Published in required format. Fails to meet length or resolution requirements. Generally follows copyright laws.	Meets length and resolution requirements. Published in required format. Follows copyright laws.	
			Total Score	

Appendix C - Pre- and Post-test Videos

The following are the videos used for the Test of Analytical Video Viewing (TAVV) pre- and post-test:

Pre-Test Videos

Video 1) Citi: Happy Princess Wonderland (Length: 0:33)
http://www.youtube.com/watch?v=kJ6vGzJJ0M8

Video 2) Now is the Perfect Time to Visit the Gulf (Length: 1:00)
http://www.youtube.com/watch?v=0FidIIQO6ZY

Video 3) NBC Oil Disaster Newscast (Length: 2:59)
http://www.msnbc.msn.com/id/3032619/vp/38807618#39546095

Post-test videos

Video 4) Old Spice - The Man Your Man Could Smell Like (Length: 0:33)
http://www.youtube.com/watch?v=owGykVbfgUE

Video 5) Police Defend Use of Force on 'Occupy UC Davis' (Length: 2:01)
http://sacramento.cbslocal.com/2011/11/18/police-defend-use-of-force-on-occupy-uc-davis/

Video 6) UC Davis Chancellor apology (Length: 1:27)
http://www.youtube.com/watch?v=a740YsZIb0E

Appendix D - Data Tables

D1 – TAVV Raw Scores – Intervention Group

TAVV Raw Scores - Intervention Group

	Pre-test					Post-test				
ID	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
NW175	11	8	8	27	1.41	11	8	10	29	1.25
NW564	11	8	5	24	2.45	10	9	10	29	0.47
NW510	11	6	8	25	2.05	9	9	8	26	0.47
NW622	9	6	10	25	1.70	8	9	9	26	0.47
NW716	8	8	7	23	0.47	9	9	8	26	0.47
NW749	9	7	9	25	0.94	9	8	9	26	0.47
NW060	11	7	9	27	1.63	8	8	9	25	0.47
NW805	11	9	9	29	0.94	8	7	10	25	1.25
NW065	11	7	9	27	1.63	7	9	8	24	0.82
NW246	9	8	5	22	1.70	10	5	9	24	2.16
NW254	10	6	7	23	1.70	7	8	9	24	0.82
NW378	8	6	7	21	0.82	9	7	8	24	0.82
NW281	7	8	4	19	1.70	7	7	9	23	0.94
NW955	6	4	6	16	0.94	7	7	9	23	0.94
NW957	9	7	8	24	0.82	9	6	8	23	1.25
NW107	7	6	6	19	0.47	7	7	7	21	0.00
NW526	9	7	8	24	0.82	6	8	7	21	0.82
NW895	10	7	7	24	1.41	7	7	7	21	0.00
NW053	8	7	8	23	0.47	7	7	6	20	0.47
NW642	9	8	8	25	0.47	8	8	4	20	1.89
NW789	9	8	3	20	2.62	5	7	7	19	0.94
NW984	8	8	8	24	0.00	6	6	7	19	0.47
Mean	9.14	7.09	7.23	23.45	1.24	7.91	7.55	8.09	23.55	0.80

D2 – TAVV Raw Scores – Control Group

TAVV Raw Scores - Control Group

	Pre-test					Post-test				
ID	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
ES486	11	10	10	31	0.47	9	8	11	28	1.25
ES498	9	9	8	26	0.47	8	9	10	27	0.82
ES334	7	9	10	26	1.25	6	10	10	26	1.89
ES622	9	8	9	26	0.47	10	8	8	26	0.94
ES223	8	8	9	25	0.47	8	6	11	25	2.05
ES229	7	5	9	21	1.63	8	9	8	25	0.47
ES272	8	7	7	22	0.47	7	9	9	25	0.94
ES849	8	7	11	26	1.70	9	10	6	25	1.70
ES860	8	8	8	24	0.00	9	7	9	25	0.94
ES429	10	6	8	24	1.63	8	8	8	24	0.00
ES172	6	3	7	16	1.70	6	8	9	23	1.25
ES542	8	7	8	23	0.47	6	7	10	23	1.70
ES404	8	7	9	24	0.82	7	8	7	22	0.47
ES823	8	9	12	29	1.70	6	8	7	21	0.82
ES292	11	9	11	31	0.94	10	8	2	20	3.40
ES328	8	9	9	26	0.47	5	7	7	19	0.94
Mean	8.38	7.56	9.06	25.00	0.92	7.63	8.13	8.25	24.00	1.22

D3 – TAVV Raw Scores – Intervention Group by Age

TAVV Raw Scores by Age - Intervention Group

18-24	Pre-test					Post-test				
ID	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
NW175	11	8	8	27.00	1.41	11	8	10	29.00	1.25
NW716	8	8	7	23.00	0.47	9	9	8	26.00	0.47
NW749	9	7	9	25.00	0.94	9	8	9	26.00	0.47
NW065	11	7	9	27.00	1.63	7	9	8	24.00	0.82
NW378	8	6	7	21.00	0.82	9	7	8	24.00	0.82
NW895	10	7	7	24.00	1.41	7	7	7	21.00	0.00
NW053	8	7	8	23.00	0.47	7	7	6	20.00	0.47
NW642	9	8	8	25.00	0.47	8	8	4	20.00	1.89
NW984	8	8	8	24.00	0.00	6	6	7	19.00	0.47
Mean	9.11	7.33	7.89	24.33	0.85	8.11	7.67	7.44	23.22	0.74

25+	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
NW564	11	8	5	24.00	2.45	10	9	10	29.00	0.47
NW510	11	6	8	25.00	2.05	9	9	8	26.00	0.47
NW622	9	6	10	25.00	1.70	8	9	9	26.00	0.47
NW060	11	7	9	27.00	1.63	8	8	9	25.00	0.47
NW805	11	9	9	29.00	0.94	8	7	10	25.00	1.25
NW246	9	8	5	22.00	1.70	10	5	9	24.00	2.16
NW254	10	6	7	23.00	1.70	7	8	9	24.00	0.82
NW281	7	8	4	19.00	1.70	7	7	9	23.00	0.94
NW955	6	4	6	16.00	0.94	7	7	9	23.00	0.94
NW957	9	7	8	24.00	0.82	9	6	8	23.00	1.25
NW107	7	6	6	19.00	0.47	7	7	7	21.00	0.00
NW526	9	7	8	24.00	0.82	6	8	7	21.00	0.82
NW789	9	8	3	20.00	2.62	5	7	7	19.00	0.94
Mean	9.15	6.92	6.77	22.85	1.50	7.77	7.46	8.54	23.77	0.85

D4 – TAVV Raw Scores – Control Group By Age

TAVV Raw Scores by Age - Control Group

18-24	Pre-test					Post-test				
ID	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
ES172	6	3	7	16.00	1.70	6	8	9	23.00	1.25
ES223	8	8	9	25.00	0.47	8	6	11	25.00	2.05
ES272	8	7	7	22.00	0.47	7	9	9	25.00	0.94
ES292	11	9	11	31.00	0.94	10	8	2	20.00	3.40
ES328	8	9	9	26.00	0.47	5	7	7	19.00	0.94
ES334	7	9	10	26.00	1.25	6	10	10	26.00	1.89
ES404	8	7	9	24.00	0.82	7	8	7	22.00	0.47
ES429	10	6	8	24.00	1.63	8	8	8	24.00	0.00
ES498	9	9	8	26.00	0.47	8	9	10	27.00	0.82
ES542	8	7	8	23.00	0.47	6	7	10	23.00	1.70
ES622	9	8	9	26.00	0.47	10	8	8	26.00	0.94
ES823	8	9	12	29.00	1.70	6	8	7	21.00	0.82
ES849	8	7	11	26.00	1.70	9	10	6	25.00	1.70
ES860	8	8	8	24.00	0.00	9	7	9	25.00	0.94
Mean	**8.29**	**7.57**	**9.00**	**24.86**	**0.90**	**7.50**	**8.07**	**8.07**	**23.64**	**1.28**

25+	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
ES229	7	5	9	21.00	1.63	8	9	8	25.00	0.47
ES486	11	10	10	31.00	0.47	9	8	11	28.00	1.25
Mean	**9.00**	**7.50**	**9.50**	**26.00**	**1.05**	**8.50**	**8.50**	**9.50**	**26.50**	**0.86**

D5 – TAVV Raw Scores – Control Group By Year in College

TAVV Raw Scores by Year In College - Control Group

Lower Years	Pre-test					Post-test				
ID	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
ES486	11	10	10	31.00	0.47	9	8	11	28.00	1.25
ES498	9	9	8	26.00	0.47	8	9	10	27.00	0.82
ES334	7	9	10	26.00	1.25	6	10	10	26.00	1.89
ES622	9	8	9	26.00	0.47	10	8	8	26.00	0.94
ES223	8	8	9	25.00	0.47	8	6	11	25.00	2.05
ES229	7	5	9	21.00	1.63	8	9	8	25.00	0.47
ES272	8	7	7	22.00	0.47	7	9	9	25.00	0.94
ES849	8	7	11	26.00	1.70	9	10	6	25.00	1.70
ES860	8	8	8	24.00	0.00	9	7	9	25.00	0.94
ES429	10	6	8	24.00	1.63	8	8	8	24.00	0.00
ES542	8	7	8	23.00	0.47	6	7	10	23.00	1.70
ES172	6	3	7	16.00	1.70	6	8	9	22.44	1.50
ES404	8	7	9	24.00	0.82	7	8	7	22.00	0.47
ES823	8	9	12	29.00	1.70	6	8	7	21.00	0.82
ES292	11	9	11	31.00	0.94	10	8	2	20.00	3.40
ES328	8	9	9	26.00	0.47	5	7	7	19.00	0.94
Mean	**8.38**	**7.56**	**9.06**	**25.00**	**0.92**	**7.59**	**8.13**	**8.25**	**23.96**	**1.24**

D6 – TAVV Raw Scores – Intervention Group By Year in College

TAVV Raw Scores by Year In College - Intervention Group

Lower Years	Pre-test					Post-test				
ID	Video 1	Video 2	Video 3	Total	SD	Video 4	Video 5	Video 6	Total	SD
NW564	11	8	5	24.00	2.45	10	9	10	29.00	0.82
NW065	11	7	9	27.00	1.63	8	8	9	25.00	0.82
NW805	11	9	9	29.00	0.94	8	7	10	25.00	0.82
NW246	9	8	5	22.00	1.70	10	5	9	24.00	0.82
NW254	10	6	7	23.00	1.70	7	8	9	24.00	0.82
NW957	9	7	8	24.00	0.82	9	6	8	23.00	0.82
NW107	7	6	6	19.00	0.47	7	7	7	21.00	0.82
NW895	10	7	7	24.00	1.41	7	7	7	21.00	0.82
NW053	8	7	8	23.00	0.47	7	7	6	20.00	0.82
NW642	9	8	8	25.00	0.47	8	8	4	20.00	0.82
NW984	8	8	8	24.00	0.00	6	6	7	19.00	0.82
Mean	**9.36**	**7.36**	**7.27**	**24.00**	**1.10**	**7.91**	**7.09**	**7.82**	**22.82**	**0.82**
Upper Years	**Video 1**	**Video 2**	**Video 3**	**Total**	**SD**	**Video 4**	**Video 5**	**Video 6**	**Total**	**SD**
NW175	11	8	8	27.00	1.41	11	8	10	29.00	1.25
NW749	9	7	9	25.00	0.94	9	8	9	26.00	0.47
NW510	11	6	8	25.00	2.05	9	9	8	26.00	0.47
NW622	9	6	10	25.00	1.70	8	9	9	26.00	0.47
NW716	8	8	7	23.00	0.47	9	9	8	26.00	0.47
NW060	11	7	9	27.00	1.63	8	8	9	25.00	0.47
NW378	8	6	7	21.00	0.82	9	7	8	24.00	0.82
NW281	7	8	4	19.00	1.70	7	7	9	23.00	0.94
NW955	6	4	6	16.00	0.94	7	7	9	23.00	0.94
NW526	9	7	8	24.00	0.82	6	8	7	21.00	0.82
NW789	9	8	3	20.00	2.62	5	7	7	19.00	0.94
Mean	**8.91**	**6.82**	**7.18**	**22.91**	**1.37**	**8.00**	**7.91**	**8.45**	**24.36**	**0.73**

D7 – VMR – TAVV Correlations

ID	VMR	TAVV Pre-	TAVV Post-	TAVV Total
NW053	18.67	23.00	20.00	43.00
NW060	16.83	27.00	28.00	55.00
NW065	9.83	27.00	24.00	51.00
NW107	12.50	19.00	21.00	40.00
NW175	18.17	27.00	29.00	56.00
NW246	11.17	22.00	24.00	46.00
NW254	16.00	23.00	24.00	47.00
NW281	15.00	19.00	23.00	42.00
NW378	15.83	21.00	24.00	45.00
NW510	15.83	25.00	26.00	51.00
NW526	18.00	24.00	21.00	45.00
NW564	13.00	24.00	29.00	53.00
NW622	19.50	25.00	26.00	51.00
NW642	18.17	25.00	20.00	45.00
NW716	17.67	23.00	26.00	49.00
NW749	18.00	25.00	26.00	51.00
NW789	19.00	20.00	19.00	39.00
NW805	12.67	29.00	26.00	55.00
NW895	19.00	24.00	21.00	45.00
NW955	13.50	16.00	23.00	39.00
NW957	16.00	24.00	23.00	47.00
NW984	15.00	24.00	19.00	43.00
	Correlation	0.091689301	-0.138583094	-0.027813139

D8 – Student Perceptions (SP) data with t-test p values

	More comfortable with video editing software	More comfortable with video cameras	More comfortable with publishing video online	Consider video valid form of communication	understand better how professional TV and film are created	better communicator for life and career	enjoy the networking class more	work hard at being knowledgeable in my topic of research	Increase my interest in learning about computer network subject	I accomplished something worthwhile	I recommend this project for future students
18-24											
Mean	4.20	2.90	3.90	3.60	3.70	3.30	3.70	3.80	3.90	4.00	3.60
SD	0.75	1.04	0.83	0.49	1.10	0.78	0.78	0.87	0.70	1.00	0.92
25+											
Mean	4.07	3.40	3.47	4.13	4.07	4.07	3.87	4.27	4.13	3.67	4.07
SD	0.85	1.02	1.02	0.96	1.06	1.18	1.02	0.77	1.02	1.30	1.18
T-test	0.35	0.14	0.14	0.05	0.22	0.04	0.33	0.10	0.26	0.25	0.15
Male											
Mean	4.13	3.26	3.70	3.96	3.87	3.74	3.78	4.09	4.00	3.83	3.83
SD	0.85	1.07	0.95	0.86	1.12	1.12	0.98	0.83	0.93	1.17	1.13
Female											
Mean	4.00	2.50	3.00	3.50	4.50	4.00	4.00	4.00	4.50	3.50	4.50
SD	0.00	0.50	1.00	0.50	0.50	0.00	0.00	1.00	0.50	1.50	0.50
t-test	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lower											
mean	4.08	3.08	3.67	3.67	4.00	3.50	3.67	4.08	4.08	4.17	4.00
sd	0.64	1.19	0.94	0.62	1.08	1.12	0.85	0.95	0.95	1.28	1.08
Upper											
mean	4.15	3.31	3.62	4.15	3.85	4.00	3.92	4.08	4.00	3.46	3.77
sd	0.95	0.91	1.00	0.95	1.10	1.04	1.00	0.73	0.88	1.01	1.12
t-test	0.84	0.56	0.90	0.16	0.74	0.28	0.51	0.99	0.83	0.16	0.62
Av/ Elect											
mean	3.80	3.00	3.60	3.90	3.30	3.50	3.80	4.10	4.10	3.50	3.40
sd	0.87	1.00	0.92	1.04	1.27	1.20	1.17	0.94	0.94	1.12	1.11
Comp/ DigMe											
mean	4.33	3.33	3.67	3.93	4.33	3.93	3.80	4.07	4.00	4.00	4.20
sd	0.70	1.07	1.01	0.68	0.70	1.00	0.75	0.77	0.89	1.21	0.98
t-test	0.29	0.42	0.99	0.96	0.04	0.42	0.94	0.96	0.86	0.21	0.10

D9 – Student Perceptions (SP) Raw Scores

More comfortable with video editing software	More comfortable with video cameras	More comfortable with publishing video online	Consider video valid form of communication	Increase my interest in learning about computer network subject	work hard at being knowledgeable in my topic of research	enjoy the networking class more	understand better how professional TV and film are created	better communicator for life and career	I accomplished something worthwhile	I recommend this project for future students	Anonymous ID
5	3	4	4	3	4	4	4	4	3	4	NW175
5	5	2	5	5	3	4	5	5	5	5	NW955
4	3	4	4	4	4	3	4	2	5	3	NW065
5	3	4	4	4	4	4	5	4	4	4	NW749
4	2	2	4	4	5	4	4	4	2	4	NW107
3	3	4	5	3	4	5	2	4	2	5	NW622
4	4	3	3	2	5	2	4	1	2	2	NW254
4	2	3	3	4	4	4	3	4	3	4	NW789
3	2	3	4	3	4	2	3	3	2	2	NW053
3	3	3	3	4	5	4	4	4	5	4	NW642
4	3	5	4	3	3	4	5	3	5	5	NW984
5	2	3	4	4	4	4	5	4	5	5	NW246
2	4	2	5	5	5	5	4	5	2	3	NW510
3	3	3	4	2	3	2	3	2	3	2	NW180
5	5	5	3	5	2	5	1	3	4	4	NW473
4	3	5	5	4	5	4	5	5	3	4	NW526
5	5	5	5	5	4	4	4	5	5	5	NW564
5	4	5	4	4	3	4	4	4	4	4	NW716
4	2	3	3	4	4	3	3	2	3	2	NW378
5	5	5	5	5	5	5	5	5	5	5	NW060
4	4	4	4	5	5	4	5	5	5	5	NW957
4	3	4	3	5	3	4	5	4	5	5	NW805
5	3	4	5	5	5	5	5	5	5	5	NW281
4	1	3	3	5	5	4	4	4	5	4	NW895
4	3	3	2	4	4	2	2	3	3	2	NW125

D10 - TAVV Scores Frequency Table

TAVV Score	Control Pre-test	Control Post-test	Interv. Pre-test	Interv. Post-test
16	1	0	1	0
17	0	0	0	0
18	0	0	0	0
19	0	1	2	2
20	0	1	0	2
21	1	1	1	3
22	1	1	1	0
23	1	2	3	3
24	3	1	5	4
25	1	5	5	2
26	5	2	0	4
27	0	1	3	0
28	0	1	0	0
29	1	0	1	2
30	0	0	0	0
31	2	0	0	0

Appendix E - Pilot Study Summary

After completing the video term paper project, twenty-seven students in the Spring 2013 Networking 1 course completed the *SP* student perceptions survey instrument (Appendix B3). The demographics of these students were typical of many computer technology courses. Twenty-four of the 27 student participants were male, comprising 89% of the population, and 3 were female. A majority of students (n = 18, 67%) were of traditional college age between 18-25 years, while the remaining, non-traditional aged students (n = 9, 33%) were over 26 years of age. The pilot instrument included age categories for 25-29, 30-40, and 40+, however this granularity proved to be not very useful having few students in each of these, so the instrument will be revised into having two age categories of traditional (18-25) and non-traditional (26+) ages.

Students from all four of the undergraduate years were represented in the study with 19% (n = 5) first-year, 35% (n = 9) sophomores, 23% (n = 6) juniors, and 23% (n = 6) seniors. One additional student did not report his/her year in college. A number of different majors participated in the study. Computer studies was the most common major having 55% (n = 15) of respondents, while the categories of digital media, electronics, and other majors were each 15% (n = 4) apiece.

A self-report of prior experience with various video-making technologies was included in the pilot study for answering the first research question. Only 15% (n = 4) of surveyed students had made a video for a college level class, while 33% (n = 9) had previously made a video for a middle or high school class.

TAVV Trial Run

To pilot-test the TAVV instrument, three students who participated in the previous year's video project (but were not part of this study) were recruited to view a news report video and an advertising video and respond to the TAVV instrument questions. The two videos used in the trial run came from the list of videos shown in Appendix C (Video 3-Oil Spill Disaster and Video 4-Old Spice Commercial). These students were selected because of their previous level of success with completing the video project and because of informal conversations with the researcher indicating their interest in academic video projects. These student responses were

evaluated using the TAVV scoring key as a trial run. As were students in Ashley et al. (2012), the TAVV trial-run students were similarly able to ascertain the sender, purpose, and meaning of the advertising message better than they were for the news report video. The scoring key was useful for distinguishing how the test participants interpreted the advertising message and the news message differently. TAVV average scores from the trial run are shown in the following table.

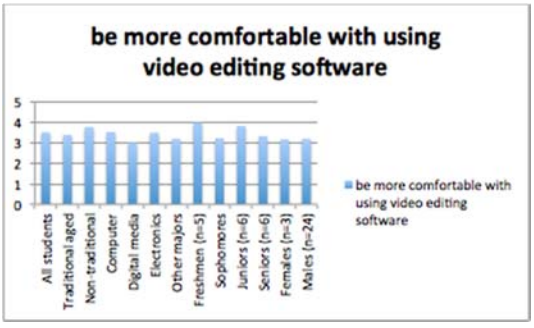
TAVV Item – Trial Run	**Points Possible**	**Video 3 - Oil Spill**	**Video 4 - Old Spice**
Q1	2.00	1.67	2.00
Q2	2.00	2.00	1.00
Q3	2.00	1.33	1.33
Q4	2.00	1.00	1.33
Q5	2.00	1.33	1.33
Q6	2.00	1.33	2.00
Total	12.00	8.66	8.99

Appendix E Table - TAVV Trial Run Scores

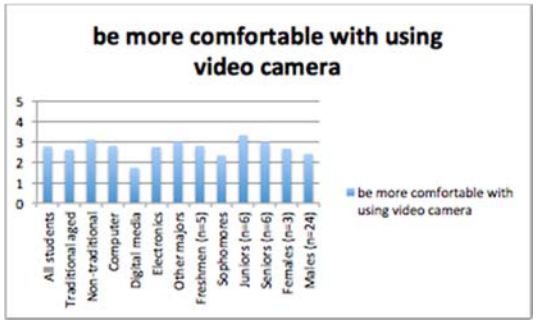
During the pilot study, acquisition of media literacy skills was not emphasized and the pre-test/post-test of media literacy was not conducted. Instead, students were simply taught the basics of video editing and digital storytelling techniques for use in creating videos about the primary course topic of computer networking. Therefore, *SP* was the lone instrument used to collect information about student perceptions of completing the video assignment.

Using a five point Likert scale of 1 – (*Strongly Disagree*), 2 – (*Disagree*), 3 – (*Neutral*), 4 – (*Agree*), 5 – (*Strongly Agree*), students were asked to rate ten statements using the prompt "*Completing the Net1 Video project has helped me to*:" The average ratings of all students surveyed (n = 27) for each question are as follows:

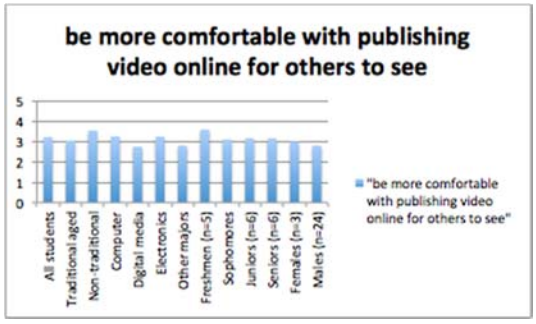
1) be more comfortable with using video editing software. Avg: 3.52



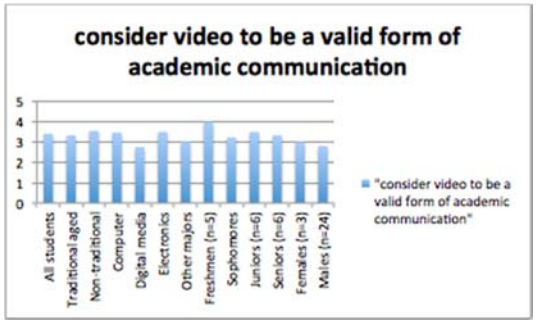
2) be more comfortable with using video cameras. Avg: 2.78



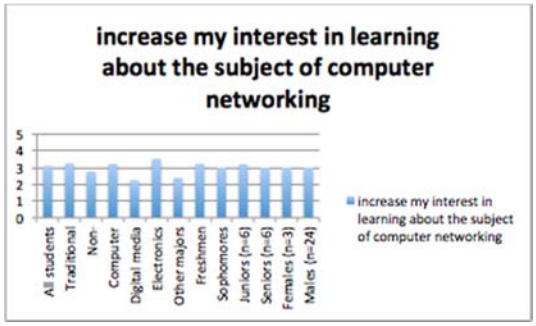
3) be more comfortable with publishing video online for others to see. Avg: 3.22



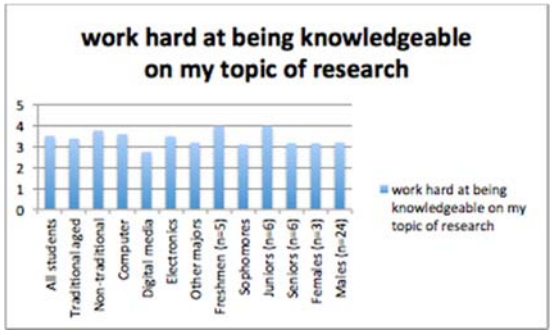
4) consider video to be a valid form of academic communication. Avg: 3.41



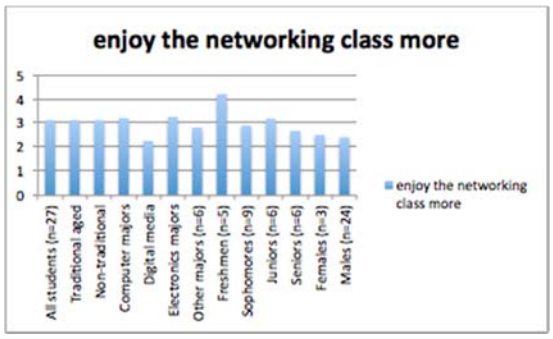
5) increase my interest in learning about the subject of computer networking. Avg: 3.07



6) work hard at being knowledgeable on my topic of research. Avg: 3.52

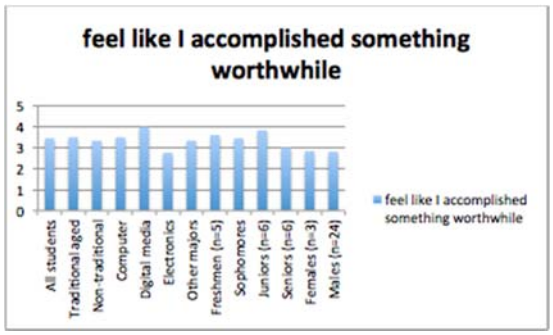


7) enjoy the networking class more. Avg: 3.11

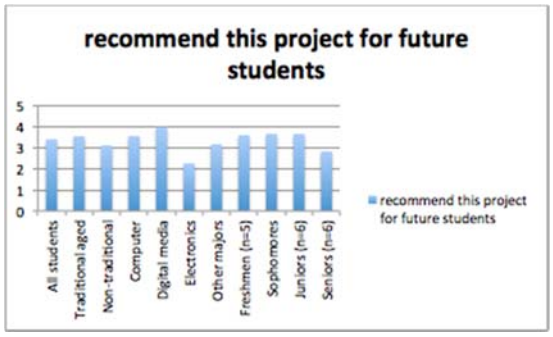


8) be a better communicator in my future life and career. Avg: 3.15

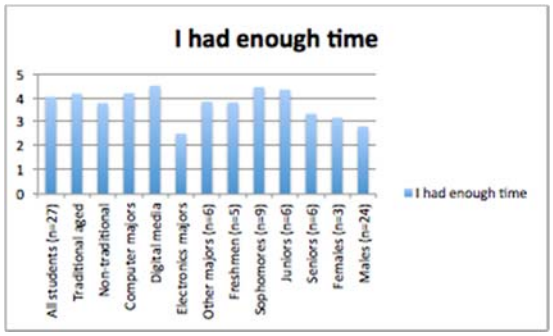
9) feel like I accomplished something worthwhile. Avg: 3.45



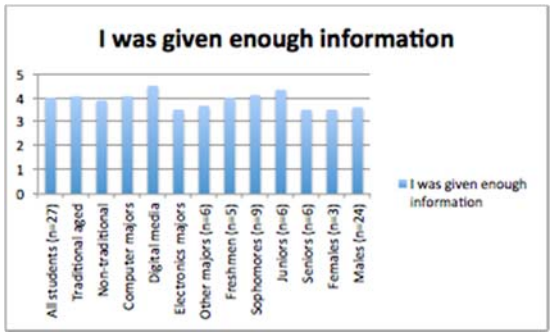
10) recommend this project for future students. Avg: 3.41



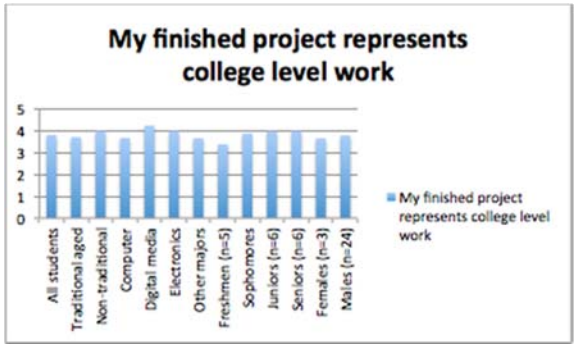
11) I had enough time to do a good job on this project. Avg: 4.04



12) I was given enough information to complete the project. Avg: 4.00



13) My finished project represents college-level work. Avg: 3.81



Pilot Survey Discussion

With the exception of one item pertaining to using video cameras, the average responses to each of the *SP* instrument questions were positive. In general, it appears that the students appreciated having this alternative approach to learning assignment, and that the data collected helps with answering the intended research questions 3, 4, and 5.

For example, some light was shed on the third research question about encouraging student "ownership of learning." With SP Item 6, "work hard at being knowledgeable on my topic of research" had an average score of 3.52, suggesting that students felt that they were actively working at their learning in the class. Additionally, SP Item 7 "enjoyment of the course" had an average score of 3.11, and freshmen in particular enjoyed the project, having an average of 4.20. Interestingly, the digital media majors enrolled in the course had an average enjoyment score of 2.25 which could indicate a variety of things, including that video is not a preferred media form for them to be working with, or that they do so much of this sort of work in other courses they take that doing another challenging project of this nature is not ideal for them. It will be interesting to see if this response holds up over time when doing future versions of this project. SP Item 9 "feel like I accomplished something worthwhile" had an average score of 3.45 and SP Item 13, "my finished project represents college-level work" had an average score of

3.81 appear to demonstrate a certain feeling of accomplishment consistent with the "engagement" and "ownership of learning" explored in the third research question.

The fourth research question has four subcomponents dealing with a) interest in learning the course content, b) comfort with making video, c) awareness of techniques used in film, TV or video, and d) the relevance of doing video projects to future life & career. The SP instrument features questions relating to each of these. Each of the SP instrument items provides data for answering at least one of these subcomponents.

Appendix F - TAVV Administration Protocol

TAVV pre-test administration

At the beginning of the video term paper intervention, the pre-test of media literacy knowledge was administered to both the control and experimental groups using the TAVV instrument (Appendix B2).

The following protocol was followed with participants in both the control and experimental groups. As student participants enter the classroom, the Engineering Technology departmental administrative assistant positioned near the classroom entrance takes attendance, and hands each a paper with his or her participant code printed on it, along with three copies of the TAVV instrument. The assistant instructs students to take their seats, circle the appropriate class identifier, and to write in their assigned anonymous participant code on each of the instruments.

Participants are shown a series of three video clips (Appendix C), one at a time, to establish a baseline of critical media literacy skills. Before the videos are shown, the experimenter thanks student participants for participating and asks them to answer each question on the pre-test instrument to the best of their ability. As each video is shown, the title of the video is announced and participants are asked to locate the instrument with that particular title printed on it. Students watch the video and are given approximately five minutes to answer the questions about the video they just viewed.

The first video, Citi's "Happy Princess Wonderland" credit card commercial was included in the pre-test because not only is it amusing, but it comes in several variations that can later segue into a class discussion of video making techniques after the pre-tests are concluded. The commercial was first introduced in the fall of 2012, was heavily promoted on network television and some students may already be familiar with it.

The second video of the pre-test called "Now is the Perfect Time to Visit the Gulf" is a public relations spot created by BP in the wake of the Deepwater Horizon oil spill catastrophe. It depicts a lively group of people representing the gulf states and describes how wonderful things are in the Gulf of Mexico. This video was selected because the message sender is mentioned in it, but only very briefly at the end. Ashley et al. (2012) used this kind of video in a similar study of media literacy among college students. In that study, a majority of students misidentified the

message sender and purpose (Ashley et al., 2012). The public relations type of video was identified by Ashley et al. (2012) as one of the more difficult types of media messages for college students to correctly analyze.

The third video is an NBC News segment of the US government response to the BP Deepwater Horizon oil spill accident. Students in the Ashley et. al. (2012) study were shown this video clip, and were generally able to correctly identify the message sender as a news agency. However, while students in that study correctly identified the purpose of this video as news, most students were unable to identify the also-important purpose of news media messages being sent for making a financial profit (Ashley et al., 2012). After the pre-test is completed, the completed instruments are collected and placed into a file folder for safe-keeping in the Engineering Technology Office until they are analyzed later in the study.

TAVV post-test administration

After the networking students complete the video project intervention, a post-test of media literacy is conducted with both the control and experimental groups. Similar to the pre-test previously described, the post-test also is also administered by viewing three videos (Appendix C) and giving the TAVV instrument that will be scored by the same three-person panel composed of the researcher, the expository writing instructor, and the computer technology instructor using the TAVV scoring key (Appendix B2).

The first video shown for the post-test assessment is the Old Spice commercial "The Man Your Man Could Smell Like". This video was part of an advertising campaign featured both on television and the Internet that was wildly successful, resulting in millions of individual views. In an earlier study of college student media literacy, Ashley et al. (2012) used this same video. Some of the participants in that study misidentified the actor in the commercial as the message sender instead of the company selling the Old Spice product, however a majority of students in that study understood the purpose of commercial messages (Ashley et al., 2012).

The second video is an official University of California Davis video that depicts chancellor Linda Katehi apologizing to an assembly of students for a police "pepper spray incident" that happened on that campus during an "Occupy UC Davis" protest in 2011. This public relations video was selected for its similarity in purpose to the BP gulf coast video used in the pre-test, as well as its particular relevance to college students. This speech was widely

reported on, and hundreds of digital cameras were in the crowd that day recording it from different points of view. The official university video features only the one-minute speech, showing only the chancellor and omitting scenes of the crowd or anything that happened before or after the speech. Other videos made that day show chanting and jeering immediately after the speech. The chancellor was roundly criticized for the pepper-spraying incident, with several university faculty members calling for her resignation. Much like the BP video did, this public relations video demonstrates the point of view of an organization trying to do damage control while omitting other points of view.

The third post-test video is from a local news broadcast made the evening of the UC Davis pepper-spraying incident. This video features the story of the incident, along with an interview with the campus chief of police who gave the order to use force on the protestors. Again, this video was selected to maintain a similarity in purpose between the pre- and post-test videos shown. As was the format used with the pre-test, this news broadcast video is also connected in its central theme with the previously viewed public relations video.

After the post-test, the completed data collection instruments are placed into a file folder along with the pre-test data instruments and stored in a file cabinet in the researcher's office for safe-keeping until the responses can be scored and entered into a data collection spreadsheet. These files will be maintained for five years in the researcher's office, after which time they will be destroyed.

Appendix G - IRB Approval

[redacted] UNIVERSITY | University Research Compliance Office

TO: Jacqueline Spears
Curriculum & Instruction
[redacted]

Proposal Number: 7108

FROM: [redacted] Chair
Committee on Research Involving Human Subjects

DATE: 3/20/2014

RE: Proposal Entitled, "Impact of Integrating Media Literacy Instruction and Projects Into a College Level STEM course."

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for [redacted] University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 1, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are [redacted] students, to the Director of the Student Health Center.

[redacted]