University of Nevada, Reno

Perceived Credibility of Historical Information across

Video Genres Among College Students

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Abstract

Educators, education administrators, parents, guardians, and policy makers are

concerned with the use of Internet streaming video, both inside and outside the

classroom. Since clearly defined sources and informed regulation of Internet information

including streaming video are absent, students need to make credible evaluations of

information. The purpose of this study was to investigate the differences in perceived

credibility among college students from the viewing of videos. The data were gathered

when the participants watched three different video genres depicting the same historical

event. The participants answered the same questionnaire after watching each video. This

study used a mixed method explanatory sequential design where the quantitative phase

informed the qualitative phase, in a design framed using Fogg's Prominence-

Interpretation Theory. Two quantitative research questions were addressed: (1) Are

there significant differences in the credibility scores among participants receiving the

information across three video genres? and (2) Is there a significant relationship between

reported time spent watching Internet streaming video and perceived credibility of

information for each participant across three streaming video genres? A non-parametric

Friedman Test was used in order to answer research question 1. The results indicated a

statistically significant difference in perceived credibility, $p < .001$. A post-hoc test

revealed there were significant perceived credibility differences between CBS News and

Apollo 13 and NASA and *Apollo 13*. The difference between CBS News and NASA was

not found to be significant. In order to answer research question 2 a non-parametric

correlation test was applied using Spearman's rho. The results were significant, $p = .030$.

On the other hand, the effect size was small, .20. After the quantitative data analysis, two

focus groups were created. Focus Group One was made up of younger participants (mean age = 18.5) and Focus Group Two of older participants (mean age = 36.5). Six focus group questions emerged from the quantitative data analysis. The focus group responses were sorted out into sub-themes using a six-step process. The data revealed the focus group participants' defined credibility as *a trusted source/expert* and *straight, factual information*. Both groups emphasized the importance of evaluating video credibility in order *to avert being manipulated* and *to be aware of biases*. The qualitative data analysis, to some extent, mirrored the quantitative data analysis. The difference between the CBS News footage and the NASA clip was not found to be statistically significant. Similarly, the focus group participants were "torn between" the CBS News footage and the NASA clip as being most credible. The *Apollo 13* clip received no responses for being most credible.

Keywords: credibility, digital generation, younger generation, older generation, streaming video.

Acknowledgments

He shared the essence of his teaching experiences in his book *Organics: The Law of the Breathing Spiral – A Primer of Psycho-Synthesis and Creative Education.* He wrote to the start of Chapter Nine – "Natural Order Learning According to Organics":

There is a natural way of learning, which, like sunlight and the earth,

functions by means of radiation and absorption. Given a free, relaxed,

and creative atmosphere, interest and enjoyment on the part of the teacher

and pupil, and a sensitive awareness on the part of the teacher as to what

is happening to the pupil as it happens, learning will be enjoyable, alive,

spontaneous, and stimulating.

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CHAPTER ONE: INTRODUCTION

Credibility: An Introduction

Education and Credibility

In the field of education, credibility influences learning (Hattie, 2009). In his first study, Hattie found that of 136 classroom interventions identified, the most effective way for teachers to improve education was to raise the quality of pupil-teacher interactions. In 2012, Hattie updated his research adding 14 more interventions to the list and the highest new entry was teacher credibility, ranking number 4 out of 150. When asked about teacher credibility, Hattie responded: "If a teacher is not perceived as credible, the students just turn off" (Evans, 2012, p. 1).

In addition to evaluating teacher credibility, other researchers (e.g., Berlo, Lemert, & Mertz, 1969; Tseng & Fogg, 1999) found students need to develop effective expertise in verifying information credibility. This implies that educators who are not as familiar with digital technology — that is individuals who were born before the existence of digital technology and adopted it later in life — need to be responsive to their more digitally immersed students by instructing their students to develop and use critical thinking skills when gauging information for credibility (Meyers & Bryant, 2004).

Marc Prensky originally used the terms "digital native" and "digital immigrant" in a 2001 essay. As he clarified in 2012, he employed these terms more as a metaphor than as rigidly defined terms. He continues to use these terms on his website, in his writing, and in presentations, but is careful to qualify what he means. For example, he does not mean that *everyone* born after or before a certain date knows everything or nothing about technology. He is quick to emphasize that all people need to find "digital wisdom," that

is, how to best use technology for the betterment of all (Prensky, 2012, http://marcprensky.com/digital-native/). Therefore, teachers, students, administrators, parents, and policy makers must cultivate digital wisdom. Harris (2010) cautions educators with this advice:

> Critically examine the Internet for credibility, accuracy, reasonableness, and support. The credibility of video is supported by precise information about the video's creator and the source of the video. Credibility should be questioned when there is limited information about the creator and a lack of quality control. Educators must consider how comprehensive and complete the information in a video is before presenting it to a class. The accuracy of the information must be questioned when it is one-sided or dated (http://www.virtualsalt.com/evalu8it.htm).

Furthermore, according to Metzger and Flanagin (2010), when students make decisions that are not based on credible evidence, they can take action on misinformation, misunderstandings, and misevaluations that could have serious consequences even beyond a low grade on an assignment or in a course. For example, major life decisions about education, career, finance, and health could be compromised with inaccurately assessed credibility.

A student's perception of a teacher's credibility can be influenced by a teacher's digital communications and interactions with his or her students (Myers, 2004; Myers & Bryant, 2004; Nesler & Aguinis, 1993). In other words, a teacher's credibility can shape student opinions, attitudes, and behaviors. A teacher's low credibility ranking

tends to have very little power to influence even when the message's accuracy is determined to be relatively high (Fogg, 2003b; Hovland & Weiss, 1951).

As Internet activity increases, information accessing and filtering increases. This requires educators and students to deal with sources that are often unreliable and not highly credible. Educators need to recognize that their students are faced with credibility assessment challenges. Furthermore, these educators find that instructing students in proven critical thinking skills is necessary when their students evaluate Internet-accessed information (Myers & Bryant, 2004). Educators are not alone in being challenged by assessing credibility. Other practitioners in fields as diverse as information science, marketing, communications, psychology, management information systems, and human-computer-interaction (HCI) are investigating how to assess credibility (Rieh & Danielson, 2007). When students graduate from college and enter the workforce in these fields, evaluation of credibility will be essential.

It is estimated that students take in more than 34 gigabytes of digital information per day outside the classroom, which is a 350 percent rise in information consumption from thirty years ago (Bohn & Short, 2009). The proliferation, ease of access, and volume of information have transformed a student's educational experience (Bohn & Short, 2009; Buckley, et al., 2010). Two examples of this student experience are the mathematics-learning videos from the Khan Academy website (Khan Academy.com, 2015) and the ability to access primary source documents at the Library of Congress (http://www.loc.gov/index.html).

Before the digital age, research focused on locating information (Rieh, 2002). With the volume of information and the ease of access, the focus has changed to

assessing the credibility, significance, and reliability of information (Baildon & Damico, 2009). Digital age students view the Internet as "a primary source of information" (Graham & Metaxas, 2003, p.75). A study of students' online research practices suggested that many students struggle to identify credible sources (Graham & Metaxas). "All future educational ventures must focus on teaching users the Internet is an unmonitored method of sharing information" (Graham & Metaxas, p. 75). Thus, there is a need for more research on students' perceived credibility of Internet accessed information including video viewing.

Credibility: A Definition

Credibility counts when believing an information source – including video. Videos that are considered credible by an audience, influence opinions, change attitudes, and drive behaviors. On the other hand, information [videos] with low credibility has little such power (Flanagin & Metzger, 2010).

At its root, "credibility" can be defined as *believability* (Fogg, et al., 2001). When individuals or information are credible, they are believable (Tseng & Fogg, 1999). The research done at the Stanford Persuasive Technology Lab (Fogg, et al., 2001) "has found that believability is a good synonym for credibility in virtually all cases" (Tseng & Fogg, p. 39).

Earlier research on credibility was mostly in the fields of journalism, communication, and psychology (Hovland & Weiss, 1951; Meyer, 1988; Watham & Burkell, 2003). More recent research on credibility by Fogg at Standford University and Meztger at the University of California, Santa Barbara has focused on Internet source credibility (Fogg, 2003; Metzger, Flanagin & Zwarun, 2003). These scholars tend to

agree that credibility is a *perceived quality* (Tseng & Fogg, 1999). In short, credibility does not exist in a person, place, thing or piece of information (Hovland & Kelley, 1953; Petty & Cacioppo, 1981; Self, 1996).

Credibility cannot be touched, seen, or heard. Nonetheless, it happens. "Much like agreement in evaluating beauty, people often agree when evaluating a source's credibility" (Fogg, 2003). However, when it comes to historical videos used in the classroom, credibility evaluations become critical. For instance, the results of one study by Butler et al, suggested, "... teachers should use popular history films [videos] with caution and should warn students about major inaccuracies in the films" (Butler et al., 2009, p.1116). When teachers did not warn students about inaccuracies, the students often mistook historical fiction for historical fact.

Credibility and the Apollo 11 Moon Landing

An example of mistaking historical inaccuracy for fact can be seen in video footage of the Apollo Moon landing. Since the 1969 Apollo 11 Moon landing, there are disbelievers debunking the milestone historical event as a conspiracy fabricated by National Aeronautic Space Administration (NASA) and the United States government (Caron, 2009). With the advent of streaming YouTube video in 2005, numerous videos have been uploaded supporting the supposed hoax.

One YouTube video uploaded in 2011 claims to provide photographic evidence. The video focuses on the American flag planted by the astronauts on the Moon's surface as waving in the wind despite there being no winds on the Moon. Additionally, still photos appear to have more than one light source as evidenced by object shadows cast at different angles (http://www.youtube.com/watch?v=WNWW8swrvWs).

To accurately evaluate streaming YouTube videos, viewers must determine their credibility. American Broadcasting Company (ABC) news reporter Christina Caron, for instance, interviewed Val Germann, president of the Central Missouri Astronomical Association and a retired professor of astronomy, at Missouri's Columbia College. Germann said there are several reasons why the shadows in the NASA film footage seem odd. The surface of the Moon is uneven, and there is "lots of light kicking back from surface of Moon" (Caron, 2009, p. 3). Moreover, Germann points out, "If they [NASA] were faking the thing they would arrange it so that the shadows would look right" (Caron, 2009, p. 3).

YouTube viewers can search and see primary source videos as a way to check for credibility. Patrick Moore of the British Broadcasting Company (BBC) interviewed Neil Armstrong, the astronaut who was first to step onto the Moon's surface after the Apollo 11 Moon landing. Moore asked Armstrong several specific questions about his first-hand experience on the Moon. The questions included: What was the Moon's atmosphere like? Could you see the sun's corona? What were the colors like? How was it judging the distance? (http://www.youtube.com/watch?v=GRJumTrie8c). Armstrong answered all these questions accurately. YouTube viewers have easy access to credible primary source videos such as the Armstrong interview. Still, students need to know how to differentiate credible videos from non-credible videos.

Statement of the Problem

The Internet has no regulatory structure screening its content. Consequently, educators have the burden of guiding digital-age students in evaluating information to a level of credibility from not at all credible to highly credible (Finn et al., 2009; Witt, 2004). Further, because of the lack of an Internet regulatory structure, educators are teaching students to become skilled at evaluating the credibility of information (Karmarkar & Tormala, 2010; Tormala & Petty, 2004).

To this end, educators and students must consider the source and authorship of digital information (Karmarkar & Tormala, 2010). Research into source credibility reveals that there is the powerful possibility of shaping opinion, attitudes, and behaviors regardless of its veracity (Fogg, 2003b; Hovland & Weiss, 1951). Even though to date there has been extensive research on Internet website credibility, there is minimal research on the credibility of historical Internet streaming video (e.g., YouTube). Students take in volumes of information on a daily basis from Internet (e.g. streaming video) (Bohn & Short, 2009). Much of this information is neither reliable nor credible (Tucher, 1997). Therefore, judging Internet (e.g. streaming video) credibility is fundamental (Finn et al., 2009).

Statement of the Purpose

The primary purpose of this dissertation is to investigate the perceived credibility among college students of three video genres: (1) documentary footage, (2) archival news footage, and (3) Hollywood film footage. More specifically, this study examined the differences of perceived credibility by college students from three video genres concentrating on the same historical event, the launch of Apollo 13 in 1970.

Educators, school administrator, parents, and guardians are concerned with the use of Internet streaming video, both inside and outside the classroom. Since clearly defined sources and informed regulation of Internet information including streaming video are absent, students need to rely on their credibility evaluations of information (Metzger, et al., 2003). The concerns of educators, administrators, parents and guardians were addressed by querying college students about their perceived credibility of historical videos.

Research Questions

The specific research questions addressed in this study were:

RQ1: Are there significant differences in the credibility scores among participants receiving the information across three video genres?

RQ 2: Is there a significant relationship between reported time spent watching Internet streaming video and each participant's perceived belief in of information received across three streaming video genres:

> (a) the official NASA documentary footage of the launch of Apollo 13.
>
> (b) an archival CBS news footage of the launch of Apollo 13, and
>
> (c) a video clip from the film *Apollo 13* showing the launch of Apollo13?

RQ 3: What are college students' perceived credibility of three streaming video genres of the same historical event?

Fogg's Theory of Credibility

There has been research and dialog on perceived credibility since the 1950s, yet until 2002 no theory explained how people assess credibility with Fogg's *Prominence-Interpretation Theory* (PIT). Although this theory evolved out of Fogg's four years of

research on website credibility at the Stanford Persuasive Technology Lab, Fogg has

encouraged credibility research on "a wide range of credibility assessments" (e.g.,

streaming Internet video) (Fogg, 2003, p.722). After Fogg and his colleagues studied

website credibility involving more than 6,500 participants, he proposed a unifying theory

on perceived credibility (Fogg, 2003). Since the current study hinges on Fogg's

credibility theory, it needs to be deline
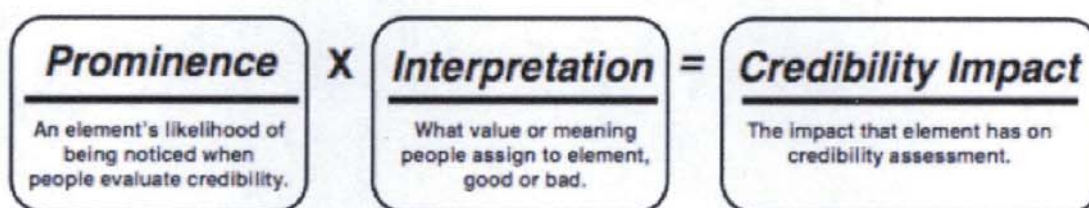
Figure 1: Core Components in Prominence-Interpretation Theory

Credibility: Prominence-Interpretation

Prominence-Interpretation Theory (PIT) rests on two assumptions (Figure 1):

1. The user [the viewer] makes a judgment about something (Interpretation), and

2. The user [viewer] notices something (Prominence).

Credibility assessment requires that one or the other or both must occur. When a

viewer notices a prominent feature and/or makes a judgment while watching a video, a

credibility assessment follows (Fogg, 2003). According to Prominence-Interpretation

Theory, the most credible information is information perceived to have high ratings in

both prominence and interpretation (Fogg, 2003).

There can be prominence without interpretation and interpretation without

prominence. For example, a viewer can note a video's prominent narrative without

judging. Or, the viewer can judge the narrative without being engaged by the narrative's prominence. Even with the one without the other, the information can be perceived as credible due to the "halo effect" — "if one virtue is evident, another virtue may be assumed, rightly or wrongly" (Fogg, 2003, p. 124). In other words, if a story's narrative is highly engaging (prominent), it may be interpreted as credible due to the halo effect. Another example used to clarify the halo effect ensues when a "tall or good-looking person is perceived as being intelligent and trustworthy, even though there is no logical reason to believe that height or looks correlate with smarts and honesty" (Cardello & Nielsen, 2013).

Fogg points out that at first glance PIT appears obvious and nothing more than common sense. Yet, he argues that it seems obvious only after it has been revealed. Nevertheless, researchers have, for the most part, concurred there are two credibility dimensions (Self, 1996). This study will concentrate on both interpretation and prominence of video viewers credibility assessments.

Researchers identify more than a dozen factors in credibility evaluations (Gaziano & McGrath, 1986; Meyer, 1988). Most of these are focused on the Interpretation component (Fogg, et al., 2003). Fogg and his colleagues appear to be the first investigators to also research Prominence when evaluating credibility.

Meyer's five interpretation credibility items (1988) were developed through statistical analysis of relevant previous research on the qualities of credibility including the Semantic Differential Scales developed by McCroskey in 1966 (Berol, et al., 1969; Hovland & Weiss, 1951; McCroskey, 1966; Newell & Goldsmith, 1997; Poindexter & McCombs, 2000). The McCroskey scales and other variations such as Meyer's scale are

used academically and in media research for more than forty years. They have become a standard credibility measure (Berlo, et al., 1969; Newell & Goldsmith, 1997).

Meyer (1988) assessed his scale for reliability by using the internal test by Cronbach (Meyer, 1988). Cronbach's alpha coefficient is a measure of how well a set of items measures a construct. An ideal alpha is measured at 0.8 or higher. Meyer conveyed that the five-item seven-point credibility scale had an alpha of 0.83 as applied to his research sample. Meyer's scale also has significant face-validity, meaning each question deals directly with credibility. The multiple items give a more accurate measurement than could be achieved by any one question (Meyer, 1988).

Fogg's research on prominence credibility on Websites led to Fogg's five prominence factors:

1. Involvement of the user (e.g., engagement) (Petty & Cacioppo, 1986).

2. Topic (e.g., topic likeability; Fogg, et al., 2003).

3. Experience (e.g., background; Stanford, et al, 2002).

4. Individual differences (e.g., learning style; Gardner, 2011).

5. Task of the user (e.g., motivated in seeking information; Stanford et al., 2002).

The Impact of Streaming Video in Education

Twenty-first century students have grown up with the Internet. They are rightly characterized as net generation students (Prensky, 2001). Net generation students use the Internet as a favored way of communication with their peers (Howe & Strauss, 2000; Schiller, 2007). They usually collaborate and share information that circumvents traditional "top-down" learning. Consequently, this significantly impacts their ability to assess credibility (Prensky, 2001).

The propagation of video technologies in education is accelerating because of the proliferation of affordable portable devices and the explosion of Internet and mobile phone users worldwide (Greenberg, 2010). This is becoming more evident in the classroom. A PBS (Public Broadcasting Service, 2010) survey of primary and secondary school teachers found that teachers who stream or download video content increased from 55% in 2007 to 76% in 2010 (Greenberg, 2010). Additionally, the survey revealed use of short video clips (3-5 minutes) was up 29% from 2007.

Originally, YouTube (Internet streaming video) catered to the everyday user. Nevertheless, the potential for educational uses of streaming video has piqued the interest of educators (Snelson, 2009). Since 2005, colleges and universities have embraced the educational uses of YouTube by often creating and operating their own YouTube channel (Snelson, 2009). In March 2009, YouTube created YouTube EDU, an assemblage of YouTube channels created and maintained by institutions of higher learning (http://www.youtube.com/edu). A year later, YouTube EDU included more than 300 colleges and universities with over 65,000 video lectures (Greenberg, 2010).

As the interest in the educational uses of YouTube increased, YouTube research in a wide range of academic disciplines including business, media studies, history, and science began to be published in peer-reviewed journals and presented at conferences (Snelson, 2009). Between 2006 and 2009, 188 peer-reviewed journal articles and conference papers with "YouTube" in the title were published (Snelson, 2009). The field of education had 23 of the 188 articles, ranking number one in fields focusing on instructional methods. Noticeably, the new streaming video technology dramatically increased the viewing of Internet videos.

Limitations

Research strives to uncover new knowledge. Part of that process requires challenging assumptions and biases. Moreover, acknowledging a study's limitations can hint at other research questions. The following limitations were part of this study.

Student lack of genuine self-reporting was a clear limitation. There may be some students who simply wanted to be recognized by their teachers and peers for their participation. To reduce this threat, students were manipulated by reminding them that they will be assisting with the research by a College of Education doctoral student. Additionally, it could be emphasized that college students are learning research-based methods of teaching. They are contributing to the research literature in a focused and earnest participation.

Researcher bias was another limitation that needs to be considered and monitored. Since the use of video in the classroom is of keen interest to the researcher, the subliminal feeling of wanting to contribute, to reveal, and benefit from the video literacy literature could distort the objectivity of the research process. This was counteracted to some degree by the randomization of the order of videos viewed, adhering to a research procedure, and consulting with other researchers who may point out noticeable researcher biases.

A limitation of the survey instrument was the possibility that some students had training and/or experience with critical thinking related to Internet credibility information. STEM (Science, Technology, Engineering, Math) educators, for example, may have instructed students on website credibility. Asking participants about their

video literacy training and experience in the screening process when soliciting participants reduced this limitation to some extent.

Participants who do not reveal that they have extensive background knowledge about the launch and voyage of Apollo 13 could skew the data generated by the self-report credibility instrument. Asking the possible study participants if they have ever watched the motion picture *Apollo 13* or any documentary films or footage about Apollo 13 and the Apollo space program could reduce this limitation. Further, it would be informative to ask participants if they have ever taken a class or a portion of a class highlighting the NASA space program, including the Apollo 13 mission.

The question of replication leading to greater reliability and external validity is challenging. Noticeably, the field is changing rapidly. New research published in the academic journals on a monthly basis may provide new evidence.

The Prominence-Interpretation Theory (PIT) that this study rests on inherently has a limitation. With approximately a decade since its introduction, the nomological network is not thoroughly developed. Additionally, changes in software, hardware, and Internet streaming video possibilities and capabilities are not fixed. More changes can be expected, some more rapidly and others more slowly.

Another limitation of the self-report research instrument was the four-point Likert scale. It is an ordinal scale, and not an interval scale such as temperature. It needs to be statistically analyzed and adjusted accordingly. This was achieved by running non-parametric tests using statistical software.

In order to answer the RQ1, a within-subject experimental design using repeated measures was used for statistical analysis. Since the independent variable was

manipulated, the same subjects were measured using the same dependent variable (credibility questionnaire). A limitation arose from this design, since there was a tendency to assume that nothing else has changed other than the independent variable (IV).

The order of the independent variable videos shown did not vary in every possible order, creating another limitation. The order repeated more than once rather than being different each time. The researcher used a random number generator before gathering data from each group. One was assigned to the NASA video, 2 to the CBS News video, and 3 to the *Apollo 13* clip.

Repeated measures have another limitation. By completing the same questionnaire three times, the participants may become *sensitized* to the questionnaire. They could become more or less responsive depending on the participant's attitude, motivation, energy level, reactions to the physical environment (e.g., changes in temperature, light, sounds), etc.

RQ 3, a qualitative question, asked in focus groups of study participants, has some disadvantages. They include:

1. Discussion can be sidetracked or dominated by a few individuals.

2. Qualitative research findings often have limited generalizability.

3. Lack of participant confidentiality and anonymity may suppress or bias information.

Offsetting these focus group limitations to some degree required the researcher to call on less verbal participants, avoid jumping to unsubstantiated conclusions, and assure participants of their anonymity.

Definition of Terms

Credibility — can be defined as believability (Fogg, et al., 2001)

Older Generation — is an individual who was born before the existence of digital technology and adopted it to some extent later in life (Meyers & Bryant, 2004; Prensky, 2001).

Net Generation, Digital Generation, Younger Generation — are students who have grown up with the Internet. Moreover, the Internet is their favored way of communication with their peers. Those who are identified as net generation technology students usually collaborate and share information that circumvents traditional "top-down" learning (Prensky, 2001).

Streaming Video — is content sent in compressed form over the Internet and displayed by the viewer in real time. With streaming video, Web users do not have to wait to download a file to play it. Instead, the media is sent in a continuous stream of data and is played as it arrives (https://www.youtube.com/watch?v=7_bSNwLRuTI).

CHAPTER TWO: LITERATURE REVIEW

Introduction

This study addresses the concerns of educators, administrators, policy makers, parents and guardians by researching students' perceived credibility of information. The self-publishing features of the Internet challenge students, educators, administrators, policy makers, parents, and guardians to evaluate decentralized and non-hierarchical information (Eagleton & Dobler, 2006). The pre-Internet world established the credibility of publishers and authors as "experts" through a respected "vetting process" (Metzger, 2007, p. 2008). Rieh (2002) maintained that in a networked world individuals are less able to rely on experts since sources are highly varied and vastly numerous. Evidence provided by several researchers (i.e., Amsbary & Powell, 2003; Meola, 2004; Scholz-Crane, 1998) indicates that individuals, including students and educators, are "unprepared to judge the credibility of online information sources that lack gatekeepers" (Ryan, 2010, p. 5).

This chapter begins with an overview of three prominent scholars' research on credibility. The next section provides a synopsis of educational information sources including textbooks, primary sources, and film/video in the classroom. This section is followed by a discussion on the current uses of streaming film and video in the classroom. The next section addresses the question: why use film/video as a pedagogical tool? The final section summarizes the issues around education and credibility.

Credibility Research

Three scholars figure prominently in the field of credibility research: Metzger, Fogg, and Meyer (Table 1). The following credibility components determine the perceived credibility of information found on the Internet and other media sources.

Table 1

Factors Influencing Credibility Judgments in Three Existing Models

Fogg's Taxomomy Of Credibility	Meyer's Model of Credibility	Metzger's Criteria of Credibility
Presumed (e.g., prior experience)	Accurate (e.g., verifiable)	Accuracy (e.g., verifiability)
Surfaced (e.g., interface design)	Unbiased (e.g., relatively neutral)	Authority (e.g., author's credentials)
Reputed (e.g., 3rd party endorsement)	Trustworthy (e.g. credentials)	Objectivity (e.g., political intent)
Earned (e.g., familiarity)	Fair (e.g., well Intentioned)	Currency (e.g., timeliness)
	Comprehensive (wide range coverage)	Coverage (e.g., comprehensiveness)

Metzger's Criteria of Credibility

In 2007, Metzger, Professor of Communication at University of California, Santa Barbara, synthesized the historical data on credibility of online media. She reviewed twenty-five previously researched elements on credibility (adapted from Alexander & Tate, 1999; Eysenbach & Kohler, 2002; Fogg et al., 2003; Freeman & Spyridakis, 2004; Metzger et al., 2003a; Metzger et al., 2003b; Rieh & Belkin, 1998; Rieh, 2002; Wathen & Burkell, 2002). She reduced the twenty-five elements to five

criteria that individuals use when making a credibility evaluation: accuracy, authority, objectivity, currency, and coverage (these criteria were developed in Alexander & Tate, 1996, Brandt, 1996; Fritch & Cromwell, 2001; Kapoun, 1998; Meola, 2004; Scholz-Crane, 1998; Smith, 1997). See Table 1 for a description of these criteria.

Metzger's criterion focuses on the individual making a credibility judgment. She approaches credibility from an information literacy viewpoint. She "encourages the appropriate evaluation of online materials and thus tries to minimize the effect that individuals have on the credibility judgment process" (Ryan-Aumer, 2010, p. 12).

In 2009, Metzger teamed up with other credibility researchers to do the "first systematic survey of youth" and their perceived credibility of online information (Flanagin & Metzger, 2010, p. x). Funded by the MacArthur Foundation and eventually published by MIT Press, the web-based survey was completed by 2,747 youth in the United States between the ages of 11 and 18.

Key findings showed that 97% of children were online by 14, and students used the Internet an average of 14 hours per week. Further, 89% of the respondents reported that "some" to "a lot" of information online is believable (Flanagin & Metzger, 2010, p. xi.) Also, noteworthy in the study was that participants rated the Internet as a "more credible source of information for school papers or projects than a book" (p. xii).

Fogg's Taxonomy of Credibility

According to B. J. Fogg of the Stanford University Persuasion Technology Lab, (2003), credibility is essentially believability. When comparing two sources of information, the individual is determining which source is most believable. This approach to credibility places the judgment on the individual seeing or hearing the

information: "Credibility is a perceived quality; it doesn't reside in an object, a person, or a piece of information" (Fogg, 2003, p 122).

Metzger places the credibility in the information rather than in the individual's perception. As a result, her view of credibility is more fixed than Fogg's. Fogg, on the other hand, focuses on perception as the source of credibility allowing for changes in perceived credibility over time. Fogg's four types of credibility are:

* Presumed

* Surface

* Reputed

* Earned

Presumed credibility implies that previous beliefs, assumptions and experiences shape the perceived judgment. Surface credibility has to do with the first impression of the information source and noticing the quality of design. A poor design can lead an individual to mistrust the information. Reputed credibility relies on reputation, authority, referrals, and endorsements. Finally, earned credibility becomes stronger over time. In other words, repeated exposure to an information source leads to greater perceived credibility.

Fogg's credibility findings resulted from research conducted in his Stanford Persuasive Technology Lab between 1999 and 2003 (Fogg, 2003). Communication and persuasion studies can be traced back to Carl Hovland at Yale University in the 1950s (Fogg, 2003, p. xi). Fogg's doctoral advisor at Stanford, Philip G. Zimbardo, earned his doctorate under Hovland. Fogg expanded persuasion research to include the influence of computers. Zimbardo wrote in the forward to Fogg's book: "B.J.'s experimental research

convincingly demonstrated that basic principles of social psychology operated in creating 'charismatic computers' that were perceived as likable and credible" (Fogg, 2003, p. ix).

More than 3,000 participants completed Fogg's web credibility survey (Fogg, 2003, p. 152). He and colleagues learned essentially that "when people perceive a site to be unbiased and knowledgeable – factors underlying trustworthiness and expertise – they will view it as credible" (Fogg, 2003, p. 156). The studies findings led to Fogg formulating his Prominence-Interpretation Theory, which was first presented at a conference in 2003 (Fogg, 2003).

Meyer's Model of Credibility

Carl Hovland and Walter Weiss pioneered measurement of media credibility in the early 1950's. After studying communication and persuasion, they found that trustworthiness, fairness, and justifiability were significant factors in perceived credibility (Hovland & Weiss, 1951). Others expanded on their initial perceived credibility research (Gaziano & McGrath, 1986; Meyer, 1988; Slater & Rouner, 1996). This research found credibility depended on truthfulness, accuracy, bias, expertise, fairness, and completeness of message.

In 1988, Phillip Meyer's (professor emeritus, School of Journalism and Mass Communication, University of North Carolina) statistical analysis revealed redundancy in some credibility variables. He concluded that only five were required to establish perceived credibility (a person's interpretation). They included accurate, unbiased, trustworthy, fair, and comprehensive.

These interpretation factors were used in this study. Fogg emphasized that participants interpret identical source elements in different ways. Culture, expectations,

and context influence the interpretation process leading to a perceived credibility (Fogg, 2003).

Prominence in Fogg's theory has to do with the likelihood that something will be perceived or noticed. If it is not perceived, there will be no credibility assessment.

Fogg's five Prominence factors include:

1. Involvement of the user (i.e. engagement) (Petty & Cacioppo, 1986).

2. Topic (i.e. likeability) (Fogg, et al., 2003).

3. Experience (i.e. background) (Stanford, et al, 2002).

4. Individual differences (i.e. learning style) (Gardner, 2011).

5. Task of the user (i.e. motivated in seeking an experience) (Stanford et al., 2002).

Fogg's theory suggests that credibility studies should examine both interpretation and prominence. This study does both.

In conclusion, there has been extensive credibility research since 2000 focusing on perceived credibility of websites. This study builds on that research by studying the perceived credibility of Internet streaming video.

Educational Information Sources: An Overview

After doing extensive research on the use of Hollywood films in the social studies/history classroom, two prominent researchers, Alan S. Marcus, Professor in the Department of Curriculum and Instruction in the Neag School of Education at the University of Connecticut, and Jeremy D. Stoddard, Assistant Professor in the School of Education at the College of William & Mary, asked the following in an article published in *The History Teacher Journal*:

How are students' experiences with film/video in the classroom similar and different from their experiences with other sources of historical information such as textbooks and primary source documents? (Marcus & Stoddard, 2007, p. 312).

This query will be explored by first looking at student experiences with textbooks, followed by student experiences with the primary source method to historical inquiry, and lastly student practices with historical film/video in the classroom.

Textbooks

By the 1880s in the United States, textbooks were the teacher's "primary tool" (Cuban, 1984, p. 24). Teachers at that time were mostly untrained and, as a result, depended on textbooks to guide their instruction. Students tended to learn from the textbook and not from their teachers. Often, teachers used a course of study published along with syllabi that had page numbers referring to the textbook. One study of Texas rural schools in 1922 found that the textbook figured in 88% of students' experience in the classroom (Cuban, p. 120) divided into the following: drills (34%), formal textbook recitation (27%), meaning of textbook sought (27%), enjoyment (5%), discussion of vital questions (4%), and constructed work (4%).

In 1935, Thomas Briggs, a Teachers College professor, assigned a graduate student to visit 21 New York City and suburban high schools to "observe the work of the best teachers of any subject" (Cuban, p. 60). Briggs and the graduate student did not choose the "best teachers." The high school principals chose the 104 teachers. The findings revealed that 80% of the teachers considered the best teachers those "teaching from the textbook" (p. 60).

In the 1995 national bestseller *Lies My Teacher Told Me*, author James Loewen, focused on "everything your American history textbook got wrong" (p. 13). He points out that teaching history, more than any other subject, depends on the textbook (Goldstein, 1978). Loewen continues his critique of history textbooks by stating what is obvious to most students: many history textbooks are boring, predictable, and biased. Loewens writes, "I find myself tongue-tied when teachers ask what textbook I recommend. Perhaps no traditional textbook can be written that will empower rather than bore us with history" (p. 356). Clearly, textbook publishers make every effort to exclude conflict, suspense, and "anything that might reflect badly upon our national character" (p. 13). He sums up his findings by describing textbook authors writing "in a tone that if heard aloud" would sound like a "mumbling lecturer" (p. 13).

Dick Parsons, history teacher at Columbia University Teachers College, wrote a response to James Loewen's *Lies My Teacher Told Me*. He provided a context for the history of the textbook. Since the Protestant Reformation and the invention of the printing press, the textbook has "provided an inexpensive, standardized, and structured foundation for schooling" (Parsons, 1999, p. 2). Parson's colleague at Columbia University Teachers College, Robbie McClintock, contends that textbooks provided an alternative to scholarly academies with "costly libraries and laboratories" (1999, p. 2).

Parsons elaborated on the historical influence of the textbook by emphasizing how public school culture developed in three ways because of the textbook (Parsons, p. 2):

1. It confined students to well defined spaces in frames of limited time.
2. It sorted and motivated students by reward systems based on competition and examination.

3. It structured curriculum standards around concepts of literacy based on traditional notions of narrowly defined intellectual disciplines.

McClintock further expanded by suggesting, "… in the process of making books usable, people not only shaped effective presentations of knowledge, but also the effective presentations began to shape the knowledge present" (p. 2). Still, 500 years after the invention of the printing press, schools are structured in the familiar classroom with desks in well-ordered rows with a teacher in the front of the classroom. Textbooks served a useful purpose in the providing education for a growing number people through the Reformation, Renaissance, and Industrial Age. In the 21st century Computer and Digital Age, the textbook, and especially the history textbook, are passé.

Loewen discovered in his research that history textbooks not only bored students but also burded them with weight (4.5 pounds on average), and excessive and predictable narratives (888 pages on average), including "typically 444 main ideas, 624 key terms and countless other factoids" (p. 2). Since the 1980s, researchers have continuously found that history textbooks are "daunting in size, bland and voiceless, fact-filled, deadly catalogues of factual material, boring, excessively dominated by coverage, and decontextualized and incoherent" (p. 2).

So, why are textbooks still used? They endure because of the school board members who continue to buy them and the textbook publishing companies that persist in selling them (Fitzgerald, 1979; Gagon, 1989; Loewen, 1995; Nash, et al, 1997; Sewall, 1987). The bottom line: profits. Education publishers are giant publishing companies that are even larger than better-known publishers. Pearson's profits, for example, are greater

than *The New York Times* Company (Carmody, 2012). Publishers with loftier profits include *News Corp* and *Amazon.*

A 2012 high school graduate [Tucker] wrote an essay on textbooks for his senior composition class. He began by writing, "Hearing the phrase 'Get out your textbook' from a high school teacher makes me want to throw up, and it is something I have heard for the last four years in almost every class from almost every teacher. Textbooks are filled with valuable information but are often outdated, and even physically damaged from past use. In this day and age of '21st Century Learning' it is insane that we are using 19th and 20th Century teaching strategies" (McLeod, p. 1).

Tucker goes on to say that the stereotype of today's students being uninterested in school is a completely false. He maintains that going to school for many students is like waking up in the movie *Groundhog Day*; each day repeats exactly the same motions as the day before. For Tucker, the culprit is the "dreaded textbook." The textbook is the high school teacher's crutch. Without the textbook he believes most teachers would be lost.

Is there an alternative? Tucker agrees the textbooks contain information that can be valuable. That's not the problem. Rather it is the rote memorization and the copying down answers word for word on worksheets. He stresses that students today want "classes to be interactive and exciting." If students are waiting for the bell to ring there's something drastically wrong about the teaching method. He writes, "Students want every class to go on longer and be surprised when the bell rings because the period went by so fast (p. 2).

According to many educators, textbooks will eventually be replaced by digital versions – "or supplanted altogether by lessons assembled from the wealth of free courseware, educational games, videos, and projects on the Web" (Lewan, 2009, p. 1). In Vail, Arizona, the school district has implemented the Beyond Textbooks initiative. Teachers create their lessons utilizing Podcasts, Prezi presentations, videos, credible Internet sites, blogs, primary source documents, and projects.

Sheryl R. Abshire, chief technology officer for the Cacasieu Parish school system in Lake Charles, LA, helps support this practice. "Kids are wired differently these days. They are digitally nimble. They multitask, transpose, and extrapolate. And they think of knowledge as infinite. They don't engage with textbooks that are finite, linear, and rote" (Lewan, 2009, p. 1). As textbooks are used less, digital resources are being used more. Digital access to primary sources contributes to this trend.

Primary Sources

One of the benefits of digital technology and the greater ubiquity of the Internet is the relative ease of accessing digital primary source documents from depositories such as the Smithsonian National Museum of American History (http://americanhistory.si.edu/) and the Library of Congress (http://www.loc.gov/). Remarkably, a 120gb computer hard drive is the equivalent of the 120,000-volume library (Massengale, 2008). A study on the relationship between access to technology and the use of primary source documents found that greater access to technology, not technical skills, was the chief reason for greater use of primary sources (Friedman, 2006).

Canadian educators have implemented an initiative to promote the use of primary sources. The History Education Network/Historie et Education en Reseau

(THEN/HiER) is "the first pan-Canadian organization devoted to promoting and improving history teaching and learning by bringing together the multiple and varied constituencies involved in history education: academic historians; public historians in museums, archives and historic sites; practicing teachers; researchers based in facilities of education; and curriculum policy makers" (Gibson, 2011, p. 3). Their goal is to implement more research-based practices [primary source analysis] from kindergarten through graduate school.

Her (THEN/HiER) blog, outlines the reasons history educators advocate the use of primary sources (Barton, 2005; VanSledright, 2008). In summary, those reasons are:

- Primary sources provide more personalized and insightful glimpses into the thoughts and experiences of people in the past.
- Compared to textbooks, use of primary sources is a more interesting and engaging way of learning history.
- Use of primary source accentuates critical and evidence-based thinking while motivating inquiry.
- Use of primary sources leads to increased knowledge and understanding of the world in the past, and the present.
- Use of primary sources allows students to participate in the process of creating or building historical knowledge in the form of accounts, which provides them with direct experience with the procedural, disciplinary knowledge formalized in the Benchmarks of Historical Thinking project that is now appearing in provincial curricula across the country.

Jason C. Fitzgerald proposes that teachers and students "analyze their textbooks as if they were primary sources" (2009, p. 37). He recommends that teachers introduce students to primary sources that may expand on and/or challenge the textbook. This gives students the experience of dethroning the text as the "ultimate authority" (p. 39).

Moreover, it leads to a greater disclosure of textbook authors' point of view and, more importantly, how viewpoint influences what is covered (Apple, 2000).

Besides the greater access to technology, the spread of primary source teaching has increased as a result of the Teaching American History (TAH) Grants established by the U.S. Congress's Civics Education Act of 2004 (Fitzgerald, 2009, p. 40). This act gives school districts the possibility of providing professional development to teachers in primary source practices. However, there is no guarantee that teachers will return to the classroom and implement new primary source strategies.

Primary source use by teachers and students focuses on four methods (Center for History and New Media, 2007):

1. Sourcing – getting to know the textbook activities.

2. Close Reading – deciphering the intended meaning of the author(s).

3. Contextualization – noting the time period being written about along with the time period in which the text was written.

4. Corroboration – checking other sources for further comparison and analysis.

Primary sources are the evidence historians use to piece together and learn about people, events, and everyday life in the past (Smithsonian, p. 3). Like detectives, historians look for clues by sifting through primary sources searching for evidence in order to reach deductions. Students can experience the evidence too by examining documents, objects, photographs, oral histories, historical films, archival footage, and documentaries. Teachers who make examining primary sources a regular classroom practice provide students the opportunity to "develop critical thinking and deductive reasoning skills that will be useful throughout their lives" (Smithsonian, p. 3). The

digital generation's easy access to primary sources allows for a transition away from a dependence on the textbook.

Film/Video in the Social Studies Classroom

Previous generations of students learned about history from reading the textbook and listening to teachers. Today, these forms of instruction take a backseat to learning about the past from such media as Hollywood commercial film, YouTube, Netflix, and video games. A study conducted by Stoddard and Marcus surveying 84 high school history teachers found that, "more than 90% reported using some portion of a feature film an average of once a week" (Marcus & Stoddard, 2007).

Along these lines, in 2012 a survey instrument administered to 79 attendees at the annual meeting of the California Council of Social Studies (CCSS). The survey focused on teacher use of video in classroom instruction. A preliminary analysis of the data revealed that 78% of the 79 attendees who completed the survey used video in the classroom two or more times per month, 47% four or more times a month, and 28% six or more times a month (Nielsen, 2014).

In 2013, the same survey was administered to 22 social studies teachers at the Northern Nevada Council of Social Studies Conference (NNCSS) and 29 social studies teachers at the California Council of Social Studies. Eighty-six percent used video as a teaching tool two or more times a month, 59% four or more times a month and 35% six or more times a month.

Many teachers accept and use video (feature length films, documentaries, short-subject, YouTube, animated motion pictures, etc.) as historical documents. Multiple researchers confirm the usefulness of video to assist students in thinking about

and interpreting the past (Seixas, 1994a; Stoddard, 2006; Stoddard & Marcus, 2005; Woelders, 2007a and 2007b).

In recent years, the application and benefits of utilizing video in the social studies classroom has been addressed in numerous journal articles. Repeatedly, the authors/researchers write about how students who acquire historical literacy skills through actively watching videos apply those skills to their history reading and primary source analysis (D'Sa, 2005; Marcus, 2005; Wilson & Memory, 2001).

Increasingly, educators are attracted to video as an instructional tool because they are easily available and students are regularly engaged with video in various forms outside the classroom. The difference between print and video resources in the social studies classroom implies that showing videos reduces the reading time and the learning of content (Splaine, 1991, p. 303). Yet research suggests that the use of streaming video improves learning and exam scores (Boster, Meyer, Roberto, Inge & Strom, 2006).

More and more students view videos on mobile devices such as smart phones and iPads outside the classroom. As a result, they develop an abundance of "constructed historical knowledge" that they bring to social studies lessons (Paska, 2010, p. 20). Consequently, students are less likely to bring other types of historical text to class since they mostly watch historical films, although usually passively not actively.

Unfortunately, many teachers do not take advantage of their students' "constructed historical knowledge," hesitating to use film/video because of concerns over appropriateness, labor intensive film/video analysis outside of school, the fear of not covering the required curriculum, and the pressures to prepare students for high stakes testing. Pre-service teachers and in-service teachers often lack professional development

in using films/videos as texts to be analyzed for perspectives and cultural features that can be examined in combination with other primary historical sources (Marcus & Stoddard, 2007). Undoubtedly, educators can no longer ignore the impact of film/video-based instruction. Students look to teachers to model "how to recognize, describe, question, and analyze historical documents including films, video, and 'short scene clips' (Marcus, et al., 2010).

Perhaps other countries will follow the United Kingdom's lead in providing teachers and students the tools necessary to bring film literacy skills to students of all ages. There are over 7,000 FilmClubs in schools throughout England, Wales, Northern Ireland, Scotland, and the Isle of Man (FilmClub.org). This education non-profit intstitution with an annual budget of 10 million dollars provides schools access to thousands of films by purchasing the licenses required to show the films. Students watch a wide range of films that include classics, black-and-white movies, documentaries, blockbusters, and foreign films.

More than 220,000 students meet weekly to watch films as entertainment and as cultural and historical texts. Students write film reviews. About 6,000 reviews are published on the FilmClub website each week. On a regular basis, students are in contact with professionals from the film industry including directors, actors, producers, screenwriters, casting directors, and costume/set designers.

Moreover, the students are encouraged to interview the film professionals who visit their school. If that was not enough, for five days at the end of each month, FilmClub runs a week of daily live streamed webcasts in which all students are encouraged to post questions on Twitter, via email, by texting, or on the phone. Some of

the film industry contributors include director Steven Spielberg, actor, producer, and director Henry Winkler, and actress Emma Thompson.

The data reveal that digital generation students watch an average of 153 hours of television each month, 3 hours of online videos, and 3 1/2 hours of video on mobile phones (Nielsen, 2009). This amounts to more time watching digital media than "doing anything but sleeping" (Avery et al., quoted in Horgen, Choate & Brownell, 2001). Yet, to date, the United States has not yet formulated and implemented media literacy standards as have many countries including England, France, Finland, Australia, and Sweden. In a multimedia world it is mandatory that American Net generationers become literate in the use of digital media.

These countries have ongoing media literacy programs on primary, secondary, and post-secondary levels. The French Ministry of Education has gone so far as to implement a media awareness program that has as its goal "to help French citizens to learn how to receive, analyze, and interpret images" (Lederer, 1988, p. 1). The Ministry has done this "in order to avoid passive viewing and manipulation" (p. 1).

After students graduate from high school, they will continue watching Hollywood films, including historical films and videos. If students leave high school knowing that a Hollywood historical film/video blends history, fiction, and the film creator's point of view, then they have acquired at least a modicum of historical film literacy. According to Alan Marcus, assistant professor of curriculum and instruction specializing in social studies education at the University of Connecticut and a former high school social studies teacher, "that's why I believe teachers should be helping students develop media literacy

skills" (Fischer, 2007). Despite their inaccuracies, Hollywood historical films can be highly effective tools that create symbiotic learning for today's students.

Streaming Video in the Classroom

The research on the impact of streaming video technology on education can be summarized as follows (Greenberg, 2010):

1. Interactivity with content – the learner relates to visual content, whether verbally, by note taking or thinking, or by applying concepts.

2. Engagement – the learner connects to the visual content, becoming drawn in by video, whether on-demand or real-time.

3. Knowledge transfer and memory – the learner may remember and retain concepts better than with other instructional media.

Put succinctly, cognitive (related to interpretive credibility) and affective (related to prominent credibility) development combine to increase retention (Greenberg, 2010).
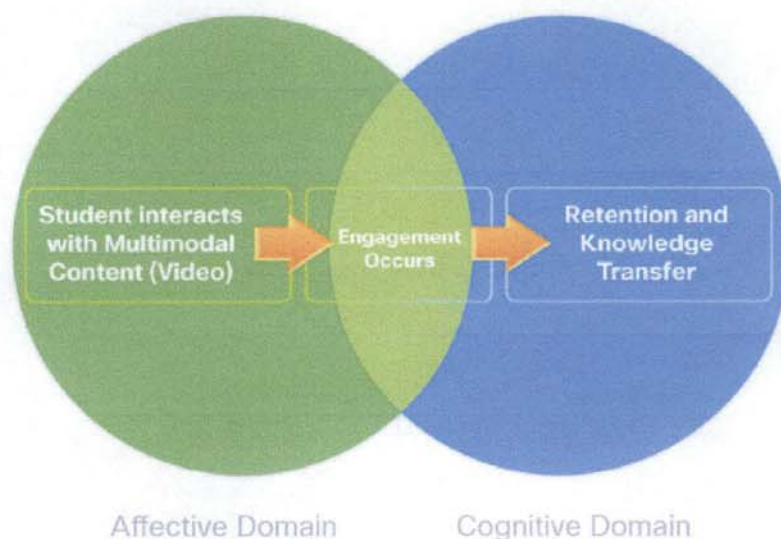
Figure 2: The Multimedia Learning Continuum, Source: Wainhouse Research

Critically viewing-streaming video improves student grades and performance, school readiness, collaborative abilities, overall academic development, and workforce preparation (Greenberg, 2010, p. 5). Furthermore, adopting streaming video technology fosters five necessary 21st-century skills:

1. Student motivation. Creating digital (e.g., video) projects empowers students and ignites a sense of purpose. Consequently, the students' motivation leads to innovation, creativity, leadership, social interaction, and project management.

2. Learner engagement. On-demand streaming content increases student engagement. When students can control the pace of learning, it enables them to review segments repeatedly until they feel they have learned the content.

3. Learner conceptuality. Advances cross-cultural understanding because of the "reality" or "conceptuality" it provides. It often decreases cultural isolation and helps minimize xenophobia.

4. Social Skills – Positive impact on the enhancement of students' social and affective skills. When students create and share their own videos, they teach others, which improves their learning.

5. Digital and multimedia literacy. Encourage and foster critical thinking, problem solving, communication, collaboration. Student use of video brings them closer to media and IT technologies and encourages the active production of content (p. 6).

The unprecedented rise of video-enabled portable devices such as smartphones and touch pads provides a new type of lightweight hardware solution for both teachers

and learners. By 2015, streaming video will represent about 66% of the world's mobile data traffic. Moreover, mobile video will more than double every year between 2010 and 2015 (Cisco, 2011).

Twenty-first century students are "fundamentally different from previous generations in the way they think, and in the way they access, absorb, interpret, process and use information, and above all, in the way they view, interact, and communicate" (Jukes, 2006). Today's students are increasingly visual-spatial learners. They are able to multi-task and interact with multimedia. Video is clearly an essential tool among many "that can have a powerful impact on student retention of information and on student engagement" (Greenberg, 2010, p. 35).

Since the advent of streaming video over the Internet in the mid-2000s, the use of video technology has grown exponentially. It is routine practice to use personal computers, laptops, iPads, and smartphones to view streaming video. Since 2005, when YouTube began streaming video clips, music videos, and film clips. Consequently, teachers now routinely use YouTube and other video streaming Internet sites in classroom instruction.

How have these technologies and resources been applied in the classroom in order to enhance learning, student engagement, and critical thinking? Students with an Internet connection to a computer, smartphone, or tablet routinely stream video content (i.e. narrative films, video clips, documentaries, games, and music). According to the Blog Herald, in 2011 "69% of all Internet users also watched streaming or downloaded videos" (Branckaute, 2010, p.l). Currently, all levels of the U.S. educational system are infused with streaming video. Prestigious universities such as Oxford, Stanford, and MIT

provide learners throughout the world with free (non-degree) streaming video lectures and courses. One researcher expressed increased use of streaming video as follows: "Video, as a fundamental agent in the process of education transformation, facilitates collaboration, accommodates for different learning styles, increases engagement and excitement among students, helps maximize school and university resources, and improves learning outcomes" (Greenberg, 2010, p. 3).

DVDs
Podcasts
Streaming video
You Tube/Teacher Tube
Videotapes   Webcams
Satellite   Camera-enabled smartphones
Laserdiscs

| 1960s / 1970s | 1980s | 1990s | 2000s | 2010s |

Television   Two-way Videoconferencing   Lecture capture
Film   Camcorders   iPADs & tablets computing
                                      Video CDs   User-generated video
                                                                      Videogames
                                                        Real-time 3D immersive worlds
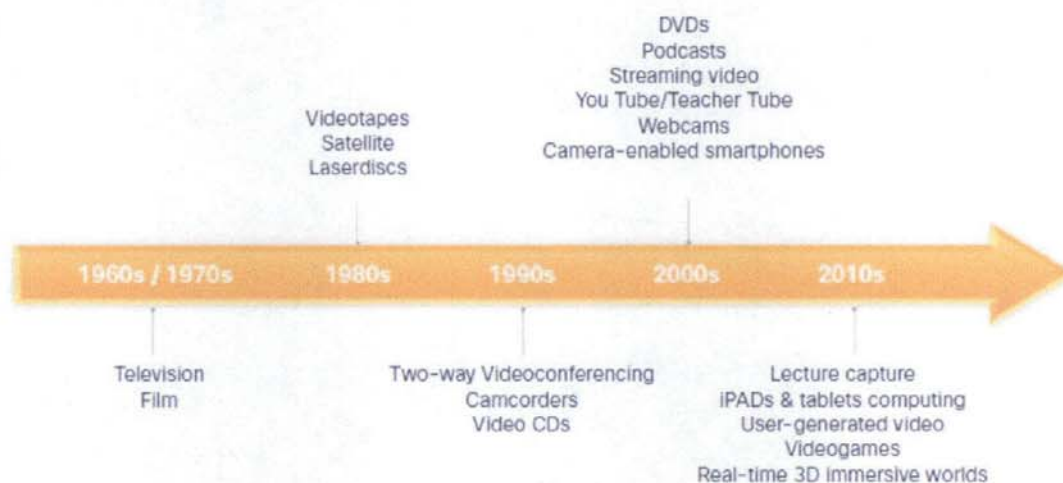
Figure 3: General Timeline for Visual Technologies in the Classroom, Source: Wainhouse Research

The paradigm shift in education and the use of streaming video as a major pedagogical tool is continuing to proliferate worldwide. The numbers compiled by researchers confirm the paradigm shift. Access to the Internet has gone from 250 million users in 2002 to 2.1 billion users in 2011 (United Nations, 2011). Currently, Internet streaming video accounts for 40% of all consumer Internet traffic, and is projected to reach 62% by the end of 2015. The sum of all video will be approximately 90% of global consumer traffic by 2015 (Cisco, 2011a).

What are educators, students, and administrators reporting about the use of video in the classroom? Amanda Paterson, Head of Science, Pymble Ladies' College, Australia says, "As soon as they come in, they are incredibly excited, and when they realize they can ask questions directly to someone in a diving suit underwater (streaming video) they are just fascinated ... anything that is going to excite students is going to excite teachers" (Cisco, 2012).

A student of Omar Farroukh High School in Beirut, Lebanon wrote about interactive video, "Before, group work was everyone alone at home and we would put them together at school. Now, we have learned to work in collaboration with each other and to be one team - to share and work together in the classroom – and how to talk to people, ask questions, and get information" (Cisco, 2011c).

At Duke University, video technologies are changing the classroom experience. Duke University student Wesley Brown described his experience. "The professor would pre-record a video for a topic that we are going to discuss and either ask us to watch it before class or watch it afterwards while he does a more interactive approach to it in class" (Duke University, 2012). Peter Lange, Duke University Provost summed it up, "...you make the classroom the place where those questions get really engaged and you get the fact-based material taught elsewhere."

YouTube. Since coming online in 2005, YouTube streaming videos have captured the attention of Internet users worldwide as a video-sharing website. By 2014, YouTube received more than 4 billion video views per day (YouTube, 2014). Besides the viewings, users uploaded more than 60 hours of video per minute (YouTube, 2014).

The uploading of educational videos on YouTube is part of a broader trend toward increased educational video viewership, which rose from 22% to 38% between 2007 and 2009 (Purcell, 2010). Other websites with educational videos have mushroomed since 2010. They are beyond the scope of this dissertation to analyze and are written about extensively elsewhere (See: Miller, 2009). Nevertheless, a few of the most popular include Netflix, Khan Academy, TED Talks, WatchKnow, Google Earth, PBS, Films On Demand, havefunwithhistory.com, and iTunes U.

Both classroom and online educators create a password protected YouTube channel to "collect, organize, post, and distribute video" (Snelson, 2011). These educational videos are often grouped into "Video Playlist Lessons" along with an attached lesson plan in the playlist description area. Video Playlist Lessons meet learning objectives across the "cognitive, affective, or psychomotor learning domains" (Snelson, 2010a). Additionally, educators and students are creating "interactive video games, simulations, or tutorials by linking videos together through the *Annotations* tool on YouTube (Snelson, 2010b).

Charleen Snelson sampled more than 188 peer-reviewed journal articles, publishing her findings under the title – "YouTube across the Disciplines: A Review of the Literature." About a third were education related. They presented "general education techniques" or "described content-specific applications of YouTube in the classroom" (p. 166).

An eighth-grade student wrote on his blog post, "Students should be able to use modern technology in the classroom because that is the world we are growing up in and it is a skill to know how to use the latest technology" (Mullen, 2008). Using YouTube is

no exception. Until recently, many school districts blocked YouTube from the classroom. California and Nevada, for example, removed the firewall block in 2012. Understandably, YouTube has highly inappropriate videos along with the "priceless tools for education" (Mullen, 2008). Administrators, teachers, and students need guidance, instruction, and a critical eye in the using of YouTube.

Madison, a seventh-grade student, put it this way on her blog (Mullen, 2008, p. 68). "I understand why teachers and principals don't like YouTube being available for students to use. There are different videos on YouTube that are unsuitable for kids to view. But, I think teachers should be able to access it because there are a lot of educational videos that are on YouTube. But if no one can get into it then all of the educational value is lost."

Literacy no longer means only reading and writing. Literacy now must include video literacy. In a presentation to the Douglas County School District in Castle Rock, Colorado, on January 17, 2014, Marc Prensky underscored the 21st-century reality that "digital natives understand and comprehend the world through technology" (https://www.youtube.com/watch?v=tOLfrBFcVFo). He began his talk by saying, "The main way my generation understood the world was through reading." He continued by emphasizing that today reading and listening to text is done on devices such as smart phones, iPhones, and Kindles. He followed that by asking the rhetorical question, "What is the new text?" He then puts up the PowerPoint slide that reads, "Video is the new text (1 min. 35 sec.).

He continued by saying we need to prepare our young people for the future and that reading and text alone will not accomplish that goal. The audience of teachers and

school administrators jeered and grumbled. He then challenged the audience to reflect on how much they use text-based resources and how much they use technology and video.

He resumed by stating that if we persist in using teaching methods from the past we are not serving our kids. He followed that immediately by making it clear that he is not saying eliminate the past text based teaching methods but "rebalance for the times that we live in" (4 min., 50 sec.). He drives home his point, "If you think it's all about reading you are living in the past. If you think it's a balance of reading and new technology like video then you are living in our times" (4 min., 56 sec.) He added, "This is what your students expect of you."

Digital generation learners must be active, critically thinking citizens, not passive consumers (White, 2008). Myers et al., (2004) adds, "social studies teachers should possess the knowledge, capabilities, and disposition to use the appropriate school levels of instructional strategies to encourage a student's development of critical thinking, problem solving, and performance skills" (p.51). Former President of the National Council of Social Studies said, "... It is essential in our citizenship role to view critically, analyze, ask powerful questions, and draw our own conclusions. Media [video] literacy, then, is essential to the role of citizenship" (Mattioli). Teachers and administrators can model critical thinking skills by carefully examining Internet videos "for credibility, accuracy, reasonableness, and support" (Jones, 2011, p. 82). A video's credibility can be checked for academically precise information and the creator's credentials.

The Flipped Classroom. Khan Academy has more than 2,400 educational videos on math, science, economics, and humanities – *and they are free.* Sal Khan, a former hedge fund manager, started Khan Academy in 2009. In 2004, Khan's 13-year

old cousin Nadia asked him to tutor her in math over the phone. Sometimes Khan was too busy to tutor so he would record lessons on video and post them on YouTube.

Eventually, Nadia told her uncle that she preferred the video to talking on the phone. Khan had a life changing light bulb moment. He "realized that remediation – going over and over something that you really ought to know – is less embarrassing when you can do it privately, with no one watching. Nadia learned faster when she had control over the pace of the lecture" (Thompson, 2011).

In 1984, the education scholar Benjamin Bloom, conducted a meta-study of research on students who received individual instruction. He found that one-on-one tutoring "reliably performed two standard deviations better than their peers who stayed in a regular classroom" (Thompson, p. 3). Furthermore, his research concluded that students who usually achieved in the mediocre range, after one-on-one instruction, leap frogged into the gifted and talented 98th percentile.

Bloom's findings sent a shock wave throughout the educational community but ultimately did little to change the factory model of education. Why the shockwave? One-on-one, teacher to student is expensive. What school district could afford one teacher per student?

Granted, one-to-one is prohibitively expensive. However, one video, one student is free of charge as long as there is an Internet connection. In the summer of 2010, Khan watched a video of Bill Gates praising Khan Academy. Gates' own kids used Khan Academy. Soon after, Khan and Gates met; the Bill & Melinda Gates Foundation donated $1.5 million to the non-profit Khan Academy. Shortly after, Google contributed another $2 million. The flipped classroom revolution had wings.

According to Carolyn Litke, Educational Technology Specialists at the Fort Worth Independent School District (ISD) Division of Technology, the flipped classroom "refers to a model of instruction where classroom-based teaching time and traditional 'homework' time are reversed or flipped. A teacher provides video lessons to be reviewed outside of class, which in turn gives teachers more time in class to focus on higher order learning skills and activities" (Litke, 2013, p. 3).

The benefits of a flipped classroom include:

- Students using video outside of class can learn at their own pace. Those who get stuck on a concept can replay and watch again.

- Flip teaching allows teachers to time-shift and expand total learning time.

- Videos can include explanatory visuals that enhance understanding.

- By allowing the students to absorb the basics of a lesson before coming to class, time is opened up for inquiry, discussion, collaboration, critical thinking, and personalized attention. (See Appendix D).

To date, the research on the flipped classroom versus the traditional, lecture-based classroom is scant.

Nevertheless, the anecdotal evidence is abundant. Michael Garver, professor of marketing at Central Michigan University says, "The students are fired up now. They're just devoted to active learning during the entire class period. It's wonderful" (Millard, 2012, p. 2). Sandy Harness, a physics teacher from Paradise Valley Unified School District (USD) in Arizona creates "vodcasts" (teacher-created videos) for students who need extra assistance. She sees that "the number of students using the videos has increased, while lecture-time has significantly decreased" (Cisco 2012b, p. 7).

The teaching and learning model currently is use in virtually all corners of the globe had its beginnings in 18th-century Prussia. Developed for use in state institutions (which included prisons and mental hospitals as well as schools), the concept of a 'sage on the stage' standing and delivering a lecture to a captive audience was intended to ensure complete control for the presenter. This model has remained the standard in pre-kindergarten through graduate educational institutions (Cisco, 2012, p. 2).

For 19 years Jon Bergan taught as a "sage on the stage." In 2006, Bergman, who teaches in the Chicago Public School District, began flipping his classroom. He noticed his chemistry students getting frustrated. In response, he began video recording his lessons and posting them on-line, allowing a student to learn the content at their own pace, in the more relaxed home environment. "I haven't given a lecture since," Bergman noted. "Now my students watch the videos, and then if they need help they can get it while we're together in class."

He is now the "guide on the side." He exclaims, "Class is no longer a dissemination of knowledge; it's a conversation with students. It allows for more hands-on, inquiry-and problem-based time with kids, and tutorials for those who are stuck" (p.5). Bergman and fellow educator Aaron Sams founded The Flipped Class Network (http://vodcasting.ning.com), "a social network for educators interested in the flipped classroom, which currently has more than 4000 members coast to coast" (p. 3). Moreover, Bergman and Sams have co-authored a book entitled *Flip Your Classroom: Reach Every Student in Every Class Every Day,* published by the International Society of Technology in Education (ISTE).

The Los Altos School District near Silicon Valley implemented the flipped classroom and the Khan Academy model in 2011. The results of student experiences with videos and learning tools are being closely monitored. "Administrators haven't found significant differences in test scores in students using Khan [Los Altos is a high-performing school district], but many report seeing a newfound enthusiasm for learning in students that they don't get through traditional textbooks" (Dunn, 2012, p. 1).

iTunes U, Netflix, and Films on Demand. When using streaming video technology in the classroom, some educators overlook the most obvious, Netflix. At last count there are approximately 200,000 streaming films, documentaries, and TV shows available on the Netflix Internet site (January 7, 2015). There are another 198,000 that can be mailed as DVDs (January 7, 2015).

During the first quarter of 2013, Netflix added more than 3 million streaming members, bringing the total to more than 36 million worldwide. About 2 million of those new subscribers were from the U.S., bringing the domestic total to 29 million, up from 23 million a year ago. Clearly, video streaming or "real time entertainment" is increasing. As the leader of the streaming video world, Netflix commands over 32% of the market, followed by YouTube (17%), Hulu (2.4%), and Amazon (1.3%) (Kerr, 2013, p. 1-2).

Sandvine, an Internet research company, projects that by 2018 streaming video will account for two-thirds of the "total data usage" over the Internet (Figure 4). This increase is directly tied to the advances in portable devices (smart phones and touch pads) and integrated smart hardware such as smart TVs, set-tops, and game consoles (Kerr, p. 2)

Mobile Network Traffic - United States
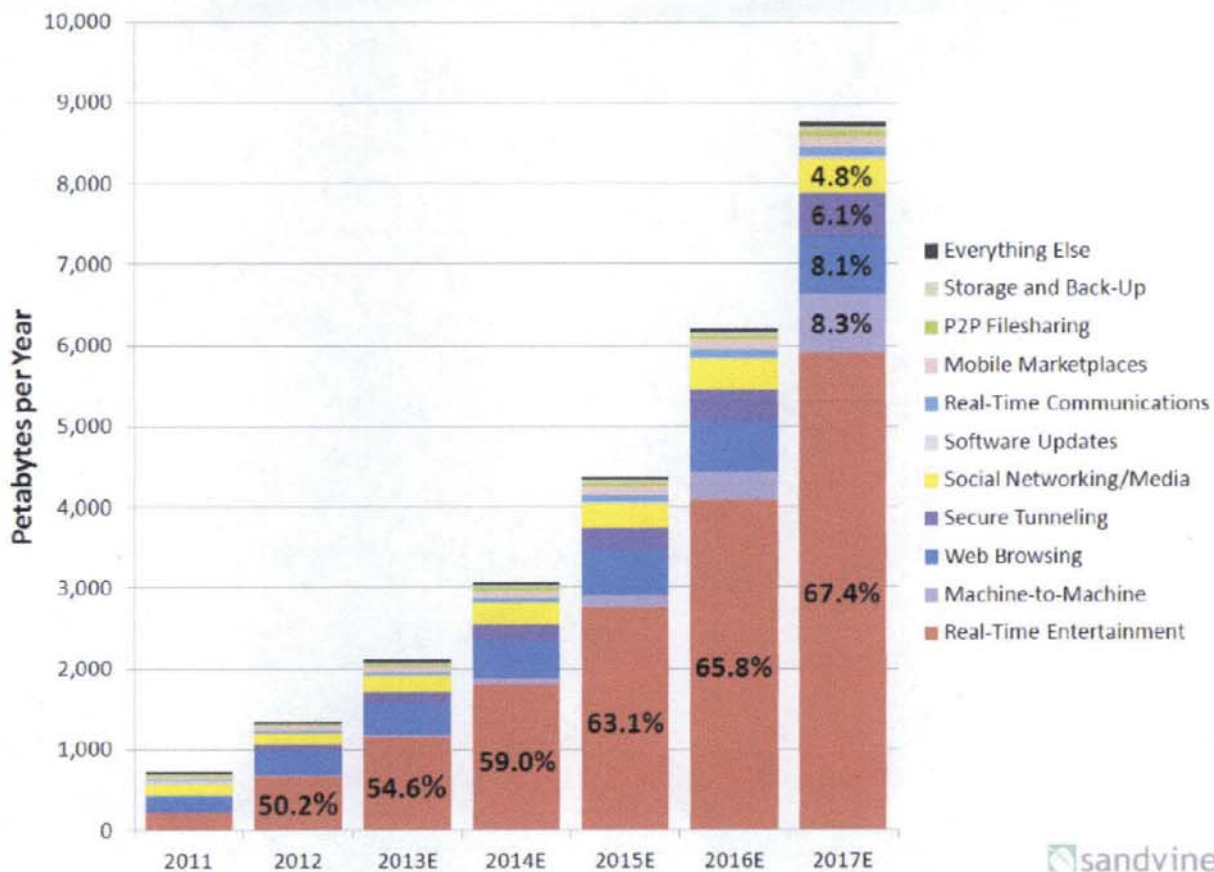
Figure 4: 2018, Streaming Video Over the Internet

Many teachers have a Netflix account for personal use. Why not use them in the classroom? I recently took a class on Music and Film. The professor forgot to bring the DVD of Carl Sagan's *Cosmos*. A student suggested going on Netflix. The professor went to the Netflix site, logged on with his personal account, and accessed *Cosmos* in the less than a minute.

Netflix has something for every grade level. The *Just for Kids* tab at the top of the webpage has hundreds of videos for elementary school students. Films and documentaries provide social studies, English language arts, and science related content for secondary school and college students.

Some of the National Education Technology Standards for Students (NETS-S) are addressed by utilizing Netflix in the classroom (McCarthy, 2012, p. 2):

1. Students apply digital tools to gather, evaluate, and use information.

   - Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.

   - Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.

2. Students demonstrate a sound understanding of technology concepts, systems, and use information.

   - Understand and use technology systems

   - Select and use applications effectively and productively

   - Troubleshoot systems and applications.

   - Transfer current knowledge to learning of new technologies.

High school communications teacher, American MacDermaid, responded to the above by commenting, "I think that Netflix would be a great tool to utilize in the classroom, especially since I already pay the $8 a month" (p. 2). She also wrote, "We watched an episode of *The Office* when we discussed the different types of conflict-resolution, and had to identify the types used during the episode" (p. 3).

Another streaming video (and audio podcasts) site that is strictly devoted to education content is Apple's iTunes U. As of March 2013, iTunes U crossed the 1 billion downloads threshold mostly because of the launching of the iTunes U dedicated app in 2012 (Harpreet, 2012, p. 1). According to Apple, there are more than 1200 colleges and another 1200 K-12 schools connected to the iTunes app.

Currently, there are 2500 public courses and thousands of private courses that can be accessed for free on iTunes U. Some of the courses have as many as 250,000 users both in the U.S. and from countries around the world. Recently, Apple announced that the Open University (U.K.) and Stanford University "both crossed over 60 million downloads". Other prestigious universities with free content on iTunes U include: Yale, MIT, Duke, Cambridge, and Oxford (p.1).

How will the free content impact traditional brick and mortar higher education? The Pew's Research Center's Internet & American Life Project and Elon University's Imagining the Internet Center queried more than 1,000 education experts. A summary of the responses follows:

> By 2020, higher education will be quite different from the way it is today. There will be mass adoption of teleconferencing and distance learning to leverage expert resources. Significant numbers of learning activities will move to individualized, just in time learning approaches. There will be a transition to "hybrid" classes that combine online learning components with less frequent on campus, in person class meetings. Most universities' assessment of learning will take into account more individually oriented outcomes and capacities that are relevant to subject mastery. Requirements for graduation will be significantly shifted to customize outcomes (Anderson, 2012).

Elementary School Principal Fred Stikins is a proponent of iTunes U along with the iPad. He writes, "An important consideration to think about is that the individuals creating these course are cutting edge classroom teachers" (Sitkins, 2012, p. 1). Sitkins gives two compelling reasons to introduce iTunes U into the classroom. First, he

witnessed first hand the "captivating power" of the courses with his own students.

Second, iTunes U provides an array of teacher professional development opportunities at

no charge (p. 2).

In addition to encouraging his teachers and students to use iTunes U, he has them

learn how to create and upload iTunes U courses. A teacher who taught at the Madison

Area Technical College wrote, "I think this is an extremely powerful tool for educators

who want to provide their course to the world, or even improve the experiences of their

local students. iTunes U has allowed me to take a class I taught for only two semesters

and put it in front of tens of thousands of people worldwide" (Sunset Lake Software,

2012, p. 3.)

A controversial study published in Computers & Education: An International

Journal found that students using iTunes U rather than attending the college lecture did

significantly better. Previous studies have indicated "class attendance is far superior to

getting lecture notes from a friend or even from the professor" (McKinney, 2009, p. 622).

Apparently, the unexpected results can be attributed to the fact that students using iTunes

U routinely listened to the lecture numerous times while the students who attend the

lecture only listen to it once (p. 622). One of Principal Sitkins' favorite stories about

iTunes U "was from the student that reported to his classroom teacher that he watched

her video six time over the weekend" (Sitkins, p. 3).

Another education only streaming video source is Films on Demand. It provides

more than 9000 titles with approximately 600 "new programs digitalized, segmented, and

made available to subscribers (Films on Demand FAQ, 2011, p. 1). Subscribers are

typically public and university libraries. Users must input a user name and password in order to view the videos.

Some of the basic functionality of Films on Demand includes the ability to (p. 2):

- Access digital content, anytime and anywhere.

- View full-length video programs in digital collection.

- View pre-defined segments from each program.

- Create personal playlists to assemble full-length videos and/or segments into a classroom presentation or to share with friends.

- Search a digital video library by title or segment using keywords, subjects, and other criteria.

- Organize digital videos into custom folders for quick and easy access to your favorite titles segments.

X-Box Kinect. Design Quest school in New York City and the United States military have embraced the non-traditional classroom. They use game-based learning (GBL) to engage students and recruits. Microsoft's Kinect is an accessory to the Xbox 360. Kinect operates by using body motions and gestures in order to control the game. Gameplay requires the players to not only be mentally engaged but also physically interactive. According to John Medina, author of *Brain Rules*, physical activity helps the learning process. He shows how physical activity boosts oxygen-rich blood flow to the brain, helping students concentrate better (Medina, 2009).

Naperville Central High School in Illinois uses "brain breaks." Rather than taking separate physical activity breaks from learning, students play games on Kinect. Students combine both brain-based physical learning and gestures with learning science, social

studies, math, and English. Games thoroughly motivate and engage. They provide feedback and a safe place to fail. "These are all principles of brain-based learning" (Kinect in the Classroom 2012, p. 1). Microsoft maintains a library of classroom lessons using Kinect (www.pil-network.com/Resources/Tools/Details/744b546a-2803-4315-b758-d810e92af2d0). Many of these lessons are aligned with Common Core standards and include step-by-step instructions and suggested grade level.

KinectEDucation, not affiliated with Microsoft, is an organization of teachers, students, parents, and administrators that supports the use of Kinect applications in the classroom. Their goal is "to transform classrooms to a 21st-century model of learning with accessible technology" (About Kinect Education, 2013, p. 1).

With KinectEDucation educators and students can freely:

* Download and upload Kinect resources for the classroom.

* Read the latest about using Kinect in education.

* Share and learn from others about using Kinect in education.

* Discuss anything else about Kinect relevant to education.

Research points to the Kinect sensor which introduces two innovative characteristics: a) motion sensing which captures gestures and voice, and b) Xbox LiVE. "The former has the potential to enhance kinesthetic learning and the latter the potential to increase the online interaction and communication among users" (Kandrooudi, 2012, p. 1). On the other hand, according to investigators, the primary shortcoming of Kinect and game-based learning is teachers often "do not know how to evaluate a game in order to achieve creative and active learning" (p. 1).

In less than a decade, the streaming video revolution and paradigm shift from mostly verbal to more visual has transpired and continues to transpire. According to Robert Sylwester, Professor Emeritus at the College of Education, University of Oregon, Eugene, the digital generation spends over 20,000 hours "with various forms of media between the ages of one and 18," double the number of hours spent in school (Sylwester, 2013, p 1-2). By some estimates, the younger, digital focused generation currently "spend more than 50 hours a week with digital media" (*Digital Nation*, Dretzin, 2010). That's more than a full workweek.

What does the research say about all this precipitous change? The straightforward answer is not very much. Why not? Dr. Mark Bauerlein of Emory University says, "by the time you design a research study, apply for funding, implement the study, and publish the results the technology has become obsolete" (*Digital Nation*, PBS). We have moved beyond it. The technologies keep outdistancing the research.

Nevertheless, brain research to date indicates that the cortex is "designed to adapt to the environment in which it lives (e.g., master the local language)" (Sylwester, p. 3). One of the concerns researchers have with the excessive involvement with electronic media is the lack of social interaction. In her book *Alone Together* MIT professor Sherry Turkle quotes a thirteen-year old, " I hate the phone and never listen to voice-mail" (p. 15). Turkle comments, "The world is now full of people who take comfort in being in touch with a lot of people whom they keep at bay" (p 15).

Dr. Clifford Nass of Stanford University, who is doing MRI brain research on digital media asks, "Are we tinkering with something more than we realize" (Digital

Nation, PBS)? Professor James Paul Gee, Mary Lou Fulton Presidential Professor of Literacy Studies at Arizona State University, addresses this question:

> There are always gains and losses. When print and writing replaced oral cultures, we lost memory. Print took away the ability to remember thousands of lines like in the Homeric epics. Is it a loss? Sure. We are losing the ability to focus for long periods of time. That's the price of gain (*Digital Nation*, PBS).

Professor Turkle reminds her students "media [video] literacy is about knowing when not to use technology as well as how to use it." She believes that given time educators will make better use of classroom technologies "learning when to turn them off when that is what makes sense pedagogically" (p. 332).

So maybe it is not what digital media brings to the developing brain that is most important, but rather what the developing brain brings to digital media (e.g. critical thinking, video literacy skills). As John Naisbitt (1982) highlighted in his book *MegaTrends*, as we become more connected to technology we seek greater connections with people, high-tech, high-touch. Professor Sylwester puts it this way, "they [the digital generation] will develop a sense of balance that permits them to be a part of the real and electronic [virtual] worlds" (p 4).

Video Pedagogy

With advancements in streaming video technologies over the Internet, there has been a dramatic increase in accessibility to video in the classroom. However, there has

been little research on use of film/video in the classroom. One of the few studies was conducted by Butler, Zaromb, Lyle, & Roediger, (2009). The study found:

1. When information in a film was consistent with the text, watching film clips increased correct recall by about 50% relative to reading the text alone.

2. When information in a film contradicted the text, people often falsely recalled the misinformation portrayed in the film, sometimes as much as 50% of the time.

3. The misleading effect often occurred even when people were reminded of the inaccuracies before viewing the film.

4. The misleading effect, however, was completely negated when a specific warning about a particular inaccuracy was provided before the film.

The results suggested, "teachers should use popular history films [videos] with caution and should warn students about major inaccuracies in the films" (Butler et al., 2009, p.1116).

What today's students know about significant historical events does not come from textbooks but from films/videos (Briley, 2002). Robert Rosenstone (2002) wrote:

It must be clear to even the most academic of historians that the visual media have become (perhaps) the chief conveyor of public history, that for every person who reads a book on an historical topic about which a film has been made ... many millions of people are likely to encounter that same past on the screen (p. 466).

Teachers need to acknowledge that students watch an untold number of Hollywood movies outside the classroom (Marcus, 2005). This immersion in film stories

streams from a variety of sources including television, movie theaters, computers, laptops, portable DVD players, iPads, iPods, and Smart phones.

Most students today are interactive with a range of digital media as a matter of course (Marcus, Metzger, Paxton, & Stoddard, 2010). Consequently, more teachers are routinely using film and video in the classroom to facilitate the teaching of history (Marcus, 2010). A National Council of Social Studies (NCSS) position statement acknowledges the digital generation. "Outside of the classroom young people regularly engage with music, and videos via MP3 players, constantly text their friends with their cell phones, check the latest videos on YouTube, and even upload one themselves" (2009, p. 2).

Most of today's teachers and school administrators are digitally disconnected or at best digitally challenged (Project Tomorrow, 2011). Yet, educators highly tout student engagement. Student engagement occurs when "students make a psychological investment in learning. They try hard to learn what school offers. They take pride not simply in earning the formal indicators of success (grades), but in understanding the material and incorporating or internalizing it in their lives" (Newmann, 1992, p. 2-3).

Unfortunately, when students enter most classrooms they are "expected to disengage" from their "digital world" (NCSS, 2009, p 2). This digital disconnect is counterproductive to cultivating historical film/video literacy. The NCSS's official position reads: "If we hope to make learning relevant and meaningful for students ... social studies classrooms need to reflect the digital world so as to better enable young people to interact with ideas, information, and other people for academic and civic purposes" p. 2).

In the introduction to *Teaching History with Film: Strategies for Secondary Social Studies*, the authors wrote, "educators are deceiving themselves if they think history movies are of trivial importance" (Marcus, et al., 2010, p. 7). How, then, can teachers use historical videos in an effective and engaging way as primary and secondary sources to increase a student's historical thinking, video literacy, and assessment of credibility? Teachers need to model and instruct students in becoming active viewers of videos rather than passive watchers of video entertainment (Russell, 2006). See Appendix C. In other words, they must become video literate by analyzing, questioning, discussing, and assessing the credibility of films/videos and other popular media.

Film/Video as a Pedagogical Tool. Rosenstone (2004) suggests that historical films are a way of "seriously attempting to make meaning of the past" (p. 29). He stresses that the "visual form of historical thinking cannot be judged by the criteria we apply to what is produced on the page, for it exists in a separate realm, one which relates to, comments upon, and often challenges the world of written history" (p. 29). Thus, teaching students to be active viewers of historical videos provides the tools for active viewing that engage students emotionally and mentally. When students implement active viewing methodologies, they become critical viewers of historical films (Metzger, 2007).

A passive, entertainment viewing of an historical film often settles on an oversimplified take on events and characters. There are good guys and bad guys, heroes and villains, and winners and losers (Metzger, 2007). Going beyond a dualistic view of history, students experience historical empathy, an opening to emotional awareness that promotes recognition and respect for marginalized peoples (Stoddard & Marcus, 2006). Further, by caring about attitudes, beliefs, actions, and intentions of historical figures,

students connect with the past on a more empathic level transforming dead facts into living understanding.

Teaching students to be active viewers of historical videos offers an alternative to the lifeless and often narrow perspective of the textbook. This requires that teachers provide the tools for active viewing that engage students emotionally and mentally. When students implement active viewing methodologies, they become critical viewers of historical films (Metzger, 2007).

Learning and interpreting a film's content knowledge goes beyond viewing it for historical inaccuracies. More importantly, students need to discover ways that films "often manipulate and trivialize historical issues" (O'Connor, 1990, p. 24). This discovery process is partially achieved by asking probing questions such as: How can the film's interpretation "be supported by the body of scholarly evidence available" and "To what extent were the script and the characters based upon direct historical evidence and to what extent were they fictionalized?" (p. 38).

History feature films tell a story about the past. Students can be taught to analyze those narratives by critically examining the storyline. This can be accomplished by substantiating through investigation the film version of the past with primary source documents. Moreover, narrative research introduces students to the experience of learning something on their own. Russell (2006) outlines a scaffold that shows that a fully developed film-based lesson utilizes active pre-viewing, viewing and post-viewing components. A film literacy set of procedures helps students dissect the narrative through "supported (or unsupported) evidence and interpretation" (Metzger, 2007, p. 70).

Narrative and storytelling are powerful teaching and learning methods. Students who see and/or listen to stories (e.g., streaming Internet video) tend to be highly engaged (Eck, 2006). Furthermore, the story-model of decision-making suggests that individuals take bits and pieces of information and place them in a temporal order (Pennington & Hastie, 1993). As a result, they create a story of the event as a whole. The Pennington and Hastie (1993) study underscores the value of information presented in a way that evokes mental images making a story easy to visualize. A computer display (e.g., on desktop computers, laptop computers, smartphones, iPads, large smart classroom screens, etc.) should make a story appear or seem more credible based on Prominence-Interpretation Theory.

Furthermore, according to researchers vivid information tends to "attract and hold" the learner's attention (Nisbett & Ross, 1980, p. 45). This leads to greater engagement and the potential for increased credibility. Moreover, it stimulates the imagination by being "emotionally interesting," "imagery invoking," and "proximate" (Nisbett & Ross, p. 45). What's more, memory storage of vivid information (e.g., multi-modal videos) tends to be more easily remembered than "pallid" (i.e., text only) information (Nisbett & Ross, p. 45).

In order to further achieve historical film literacy, students need to be taught the cultural positioning of the film by asking questions about the film's creators (Sorlin, 2001). Who are the writers, directors and producers? What are their goals and intentions? Do they have political, social and/or economic agendas? If so, what are they? (O'Conner, 1990, 2002, 2007).

Each generation looks at and remembers the past differently. An historical film reinforces or breaks down an historical perspective depending on who is watching it and when. Take, for example, two films about the Vietnam War. *The Green Berets* takes a pro-war point of view while *Apocalypse Now* offers an anti-war narrative. Regardless of the perspective, historical empathy emerges.

Historical empathy broadens further when students learn how to discern "presentism." *Presentism* is "the act of viewing the past through the lens of the present … a way of thinking that requires little effort and comes quite naturally" (Wineburg, 2001, p. 19). Looking at the past through the window of the present hampers historical video literacy and, as a result, students' perceived credibility.

> Historical thinking requires us to reconcile two contradictory positions:
> first, that our established modes of thinking are an inheritance that
> cannot be sloughed off; second that if we make no attempt to slough
> them off, we are doomed to a mind-numbing presentism that reads
> the present onto the past (Wineburg, p. 19).

The authors of *Teaching History with Film: Strategies for Secondary Social Studies* took Wineburg's position on presentism when they applied it to historical film literacy. "Many movies engage in presentism – a mode of historical thought in which present-day ideas and attitudes are anachronistically introduced into depictions of the past or are used to evaluate or judge what happened in the past" (Marcus, et al. 2010, p. 6).

Students must understand that most videos are primarily made to make money. They must, therefore, appeal to audiences now. This leads to the regular practice of presentism in most Hollywood and independent films (Metzger, 2007). Teachers need to

provide ample accurate historical content and probing questions in order to be aware of and avoid presentism as much as possible.

Furthermore, by viewing Hollywood films as social and cultural history documents presentism can be decreased. In recent years, historians and history teachers have placed less emphasis on facts and dates and more credence on what was daily life like. They ask questions that include: what was work like, what did people do for fun, how was family life. "Film has an important role to play in these histories" (Gunning, T., 2002).

Pitfalls in the Use of Film/Video in the Classroom

Despite all the fanfare advocating the pedagogical use of film and video in the classroom, the downside needs to be addressed. A questionnaire concentrating on the classroom use of film/video (n = 219) found that the average time in professional development in student video literacy skills was 0.35 hours (Nielsen & Ferrara, 2014). The social studies teacher participants were surveyed at the California Council of Social Studies Conference, the Northern Nevada Council of Social Studies Conference, and the National Automobile Museum Symposium. One hundred and forty nine of the respondents (66%) had no professional development in student video literacy skills, 63 (28%) had professional development, and 7 (6%) were unsure.

Percent of Teachers with Professional Development
in Teaching Film & Video Literacy Skills

N = 219

66%

28%

6%

No   Yes   Unsure
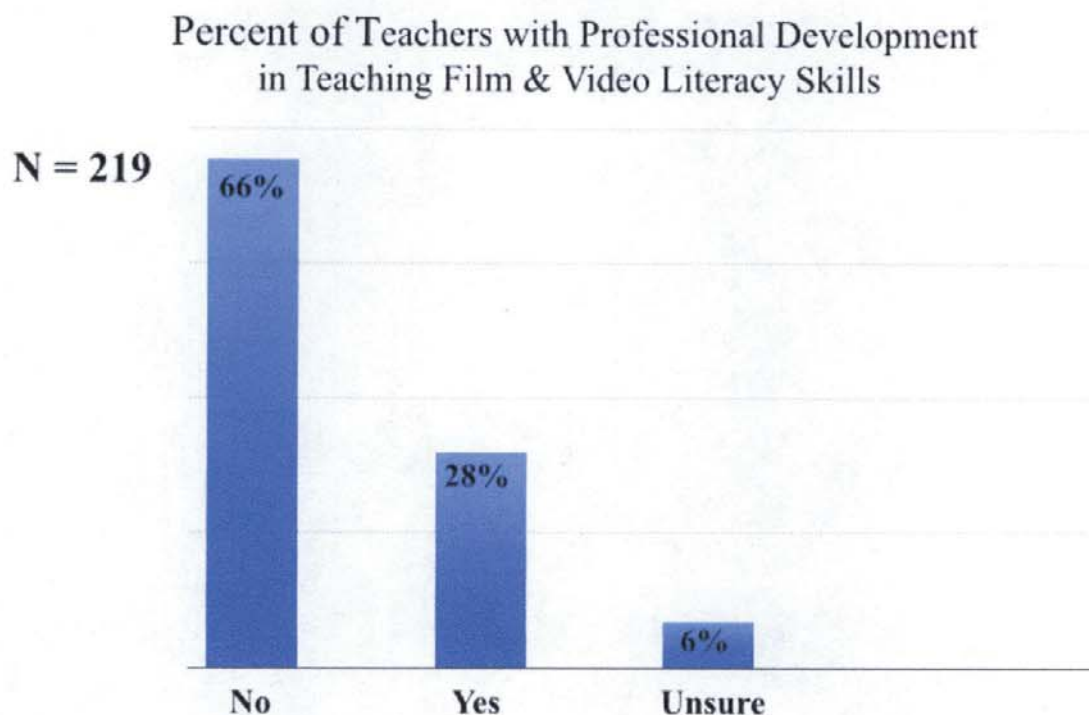
Figure 5: Professional Development in Student Video Literacy Skills

To be fair, the same study found that over 50% (n=138) of the teachers reported

they spent time developing activities to accompany a video. One teacher commented,

"I've gotten away from full-length video documentaries and will show short video clips

off of YouTube often to reinforce a topic." Moreover, nearly 85% (n = 185) of the

respondents reported viewing the video prior to using it in the classroom. All of the

above are video literacy practices.

Still, it appears many teachers do not implement active pre-viewing, viewing, and

post-viewing skills. Another study identified seven "potentially non-optimal uses of

video in the classroom" as a result of observational and interview data gathered from K-

12 teachers and school administrators (Hobbs, 2006). They include:

1. No use of pause, rewind, or review

2. Large-group viewing experiences give teachers a 'break'

3. Teacher mentally disengages during viewing experience

4. Teacher uses video viewing as a reward

5. Teacher uses video/film only as an attention hook

6. Teacher uses video to control student behavior

7. Did not make clear to students the reason(s) or purpose(s) for viewing (p. 41-43).

These practices replicate passive entertainment viewing habits in the home and movie theater (Kubey & Csikszentmihalyi, 1990). Further, it perpetuates "the 'transmission' model of education, where those who know more to those who know less understand learning as a process of sending information" (p. 41). This problem is compounded when teachers "mentally disengage" during the viewing time. Modeling this behavior sends a message to students that "that viewing is less important than other types of classroom learning" (p. 42).

Education and Credibility

Twenty-first century educators are forced to deal with the relevance and veracity of Internet information. To date, the Internet lacks the evaluation for credibility (Tucher, 1997). Therefore, educators are required to introduce and teach students to research and analyze digital information using critical thinking skills to determine appropriateness and usability (Finn, et al., 2009; Witt, 2004). By developing and using evaluative skills to weigh in on credibility, accuracy, and relevancy students can more self-regulate (Karmarkar & Tormala, 2010; Tormala & Petty, 2004). Since 2010, greater

standards for determining credibility of digital information have concentrated on origin, and authorship (Karmarkar & Tormala, 2010).

The rise of the digital era over the last thirty years has changed education in the developed/industrial countries (Adams & Bonk, 1995; Beauchamp & Kennewell, 2010; Buckley, Pitt, Norton, & Owens, 2010; Warwick, Mercer, Kershner, & Staarman, 2010). Consequently, teachers are adapting to this rapid change and the direct instruction lecture for information transfer (learning) is not as commonly used in college classrooms as it has been.

Many students take classes online. If they go to a classroom, those are often smart classrooms with wireless Internet. Digital presentations, YouTube videos, Skyping, Twitter, video gaming, social networking, emailing, blogging, researching on the Internet and other digital technologies have become the norm (Chen, 2010; Guo, 2010; Mazer, Murphy, & Simonds, 2009). Certainly, the in-person college lecture has not been eliminated. However, accompanying the traditional direct instruction are various forms of digital information delivery (Bonk, 2010; Mavrikis & Guitierrez-Santos, 2010).

Usually, new mass media modalities have not been immediately accepted. The Internet along with streaming video has introduced a new era of mass media. As with other past new technologies such as film (1900s), radio (1920s), and television (1940s), public acceptance of the world-wide-web (2000s) has been met with a combination of skepticism and fervor (Wartella & Jennings, 2000). This applies to educators as well. New technology proponents saw the beneficial educational potential for the new

technology while the detractors worried about misuse and overuse (Butsch, 2001; Wartella & Jennings, 2000).

One study on the credibility of information on the World Wide Web concentrated on scholars and post-secondary faculty (Rieh, 2002). Judging perceived credibility by laypersons (e.g., graduate and undergraduate students) requires more investigation since there is now more information available from more sources than ever before (Metzger & Flanagin). Clearly, assessing students' perceived credibility of digital information is becoming increasingly important as they do their assignments and research.

Since the 1990s, the influence and implications of digital technology on education pedagogy has been historic. Students, teachers, parents, and administrators interact through wireless digital modalities. The Internet has a powerful impact on educational experience (Bernard, et al., 2004). By 2005, college students indicated that the Internet was central to making decisions (Horrigan & Rainie, 2006).

CHAPTER 3: METHOD

Research Overview

Educators, education administrator, parents, guardians, and policy makers are concerned with the use of Internet streaming video, both inside and outside the classroom. Since clearly defined sources and informed regulation of Internet information including streaming video are absent, students need to rely on their credibility evaluations of information (Metzger, et al., 2003). The concerns of educators, administrators, parents, guardians, and policy makers were addressed by querying college students about their perceived credibility of historical videos.

This study used a mixed method explanatory sequential (Creswell, 2009) design where the quantitative phase informs the qualitative phase. Moreover, this design was framed (Creswell, http://johnwcreswell.com/videos/, 2015) using Fogg's Prominence-Interpretation Theory.

Summary of Mixed Methods Research

1. Collecting and analyzing qualitative and quantitative data (open- and closed-ended) in response to research questions.

2. Using rigorous qualitative and quantitative methods

3. Combining or integrating quantitative and qualitative data using a specific type of mixed methods design

4. Framing the mixed methods design within a broader framework (e.g., experiment, theory, or philosophy)

Figure 6: Mixed Method Research (Creswell)

In the quantitative phase the participants viewed three different video genres of the same historical event. After viewing in random order (reducing order effect by

counterbalancing) each one of the three videos, a questionnaire asking the same set of ten questions linked to the participant's perceived credibility of the videos viewed followed.

The ten credibility questions were divided evenly into five interpretive perceived credibility questions (Meyer) and five prominent perceived credibility questions (Fogg). This is in line with Fogg's theory of credibility: Prominence-Interpretation Theory of Credibility (PIT). After completing the three questionnaires, an opened ended question requested "comments, thoughts, suggestions".

Two quantitative research questions were asked:

RQ1: Were there significant differences in the perceived credibility scores among participants receiving the information across three video genres?

RQ2: Was there a significant relationship between reported time spent watching Internet streaming video and each participant's perceived credibility of information received across three video genres?

The three video genres were:

1. The official NASA documentary footage of the launch of Apollo 13.

2. An archival CBS News footage of the launch of Apollo 13.

3. A video clip from the film *Apollo 13* showing the launch of Apollo 13.

After reviewing the results of the data analysis (quantitative phase), it was expected that additional questions would emerge on the perceived credibility of participants. In order to explore the answers to those questions, two focus groups were drawn from the experimental group (qualitative phase). One focus group was composed of younger generation (17 – 23) and the other was made up of an older generation (29 – 44).

Participants and Procedure

Participants. The college student participants, both undergraduate and graduate, were

enlisted from the student population at Western United States University (WUSU)

(pseudonym). Multiple groups of participants were surveyed in a current semester class

in various majors including journalism, education, sociology, geography, etc. Thirty-plus

majors were represented. The classroom groups were populations of convenience since

the researcher scheduled classroom dates and times with instructors in various

departments ahead of time. Students were given a $5.00 gift card from Starbucks and

lunch for their participation.

The researcher explained that participation in the study was completely voluntary.

They were provided with an information sheet with researcher contact information and a

consent form giving permission to participate as per Institutional Review Board (IRB)

protocol. (See Appendix A). They checked either yes or no.

Those who decided not to participate had the option of leaving the classroom

during the viewing of the historical videos and completion of the perceived credibility

questionnaires. Those who decided to participate wrote their smart phone number and

email address on the consent form in order to be contacted by text messaging or email in

case they are selected to participate in a focus group.

The confidentiality of student participants was protected before, during, and after

the experiment. This was achieved by avoiding the use of names during the research and

by locking self-report research instruments in a file cabinet. Only the graduate student

researcher and his advisor had keys to the file cabinet. The participants were contacted

with through text messaging in order to be invited to a focus group. They need to won a

phone with phone texting capability. The researcher deleted the participants' number from his phone after the contact. Participants were contacted by email only if the text message failed.

Procedure. A smart classroom (i.e., an Internet connection, overhead projector, computer) was used for the video presentations and the connection to the Internet. The testing of the computer set-up was done previous to the scheduled start of each research session. The smart classrooms had wireless Internet. It is possible that the wireless function could be intermittent or lost disrupting the presentation. In order to avoid this problem, coaxial cable was available to connect directly to the Internet. In case of a computer failure, a laptop was available to be hooked up to the Internet as a backup. The researcher had a flash drive with the three videos. The flash drive was connected to the computer system containing the three research videos.

Students were asked to turn off cell phones, laptops, iPads, and any other portable digital device and clear the desktop. The intention was to focus the participants on the historical information presented on the videos in order to promote more accurate assessment of their perceived credibility. The classroom screen was on black until the participants were ready. Each group was randomly assigned a different order of the three video modalities and viewed the series of three videos at different days and times over a 10-day period.

Before viewing the three historical videos, the researcher briefly explained that the purpose of the study was to contribute to improving pre-service and in-service teacher use of video in the classroom by showing three different videos of the same historical event. Next, the researcher turned on the large screen making it visible to the

participants. The first randomly ordered historical information video for that group was cued up. The participants were asked to view the video presentations attentively in order to minimize distractions. As a precaution, back-up videos were stored on a laptop brought to the research session.

The classroom lighting was reduced making the videos easier to view. The participants viewed the three videos. Finally, each participant in each group was asked to individually complete the same credibility survey instrument after each video viewed. See Appendix A.

After everyone completed the numbered questionnaires, they were collected. Finally, the students were debriefed and thanked for their participation in the study. If anyone had a question about the research, it was answered at that time. After all questions were answered, the researcher left the classroom.

Materials, Instruments and Measures

Materials. There were three video genres of the same historical event, the launch of Apollo 13. The footage was selected and timed. Video clip software such as HandBrake and MPEG Streamclip were used to create the clips. The running times were as close to the same as possible.

Instruments and Measures. After the information was presented, the participants were asked to complete a survey instrument that included ten credibility questions, five for interpretation and five for prominence. A 4-point differential format was used with the more favorable response on the right. This study used Meyer's credibility model for interpretation (Meyer, 1988) and Fogg's five factors affecting prominence in order to assess student perceived credibility of historical information (Fogg, 2003).

The interpretive credibility questions were:

- How accurate did you find the information?

- How unbiased was the information?

- How trustworthy was the information?

- How fair was the information?

- How comprehensive was the information?

The prominence credibility questions were:

- How engaged were you in the viewing?

- How much did you like the video topic?

- What is your background knowledge/experience with the video content?

- How much did the videos appeal to your learning style?

- How motivated were you to participate in the study?

After completing the last series of ten questions, an open-ended question requested a participant's comments, thoughts, and /or suggestions.

Additionally, participants were asked a set of demographic questions: major, age, and gender. It was thought possible that during the data analysis the major, age, and gender of the participants could bring additional information to light that could inform questions asked in the focus groups. Another question asked participants to estimate the number of hours per week they watched streaming video over the Internet. The data from this question were used in order to determine if there was a significant relationship between reported time spent watching Internet streaming video and perceived credibility of information received by viewing streaming video. Question 4 requested the participant to estimate the number of hours they have viewed video on Apollo 13,

including the movie *Apollo 13* and/or documentary footage of Apollo 13. The final

question asked them to check from a list of 12 digital media that they utilized. Finally,

they had the opportunity to write in any other digital media they used.

Data Analysis

After all participants watched all three videos (independent variables) and

completed a credibility questionnaire (dependent variables) on each, data analysis was

used to assess the research questions:

RQ1: Were there significant differences in the perceived credibility scores among

participants receiving the information across three streaming video genres?

RQ 2: Was there a significant relationship between reported time spent watching Internet

streaming video and each participant's perceived credibility of information received

across three video levels:

(a) the official NASA documentary footage of the launch of Apollo 13.

(b) an archival CBS news footage of the launch of Apollo 13, and

(c) a video clip from the film *Apollo 13* showing the launch of Apollo13?

RQ 3: What are college students' perceived credibility of three streaming video

modalities of the same historical event.

It was determined that a minimum of 28 participants was required in order to keep

the power at .80 or better for a medium effect size (http://www.gpower.hhu.de/en.html).

There were 125 participants. A non-parametric Friedman repeated measures ANOVA

was used for statistical analysis.

In order to counterbalance the order effect, each group viewed the three videos in

random order. This was achieved by using a random name/number generator app. The

order effect occurs when participants answer questions with greater ease the second and third time. On the other hand, their performance could have suffered due to feeling tired of answering the same questions more than once. This was counteracted to some extent by keeping the questionnaire relatively short.

In addition, this study considered whether the reported time watching streaming video over the Internet was related to the perceived credibility scores. A Spearman rho was run on the data from the research instrument question asking the participants how many hours a week they watch streaming video.

Focus Groups

After data analysis of the questionnaires, dates and times for the two focus groups were chosen. The participants were contacted and communicated by smart phone text messaging. They were sent a text message the day before their focus group met reminding them of the location and time. The focus groups met on a Saturday and Sunday afternoon on the same weekend. The dates were not in conflict with any major campus event in order to allow for ease of parking, as it is free on weekends.

The focus group sessions were audio taped. The sessions lasted approximately one hour. The participants were reminded that they have previously indicated on the consent form that they were willing to participate in the study. Additionally, they were reminded that the participation was completely voluntary. If they chose not to continue, they were free to leave the focus group session.

Participants were provided with six discussion questions. At the end of the focus group session, the participants were given the researcher's contact information in case they had any questions. The researcher thanked the focus group participants and gave

each a $5.00 gift card from Starbucks. The tapes were then labeled appropriately and stored in a locked cabinet.

The transcripts of the focus group were coded with MAXQDA qualitative coding software. MAXQDA is a text coding software incorporating colors assigned to specific words, phrases and themes. This produces a document portrait providing visual data that enhances the qualitative analysis (http://www.maxqda.com/). Next, process of reading and re-reading was done in order to tease out recurring themes. The findings of the qualitative coding were further evaluated by data transformation using statistical analysis.

The final steps in data analysis of this study included: (Onwuegbuzie & Leech, 2006).

1. Data correlation – quantitative data related with qualitative data.

2. Data consolidation – quantitative and qualitative data were combined to create a consolidated data sets.

3. Data integration – quantitative and qualitative data were integrated into two separate sets of coherent wholes and then integrated into one coherent whole.

CHAPTER FOUR: RESULTS

Introduction

The purpose of this study was to investigate the differences in perceived credibility among college students from the viewing of three video genres of the same historical event, the launch of Apollo 13. The three genres were: (1) the NASA official documentary: (2) the CBS News archival footage; and (3) a clip from the Hollywood film *Apollo 13.* This study used a mixed method explanatory sequential design framed in a theory (Creswell, 2009). This required that the quantitative phase inform the qualitative phase (Onwuegbuzie & Leech, 2006).

The data were gathered when the participants watched three different video genres of the same historical event. The participants answered the same questionnaire after watching each video (See Appendix B). The questionnaire also asked the participants for demographic information that included undergraduate major, estimated hours per week watching streaming video, estimated time watching Apollo 13 related videos, and questions on the use of social/digital media.

The first section of this chapter summarizes the quantitative phase. This is followed by a summary of the qualitative phase. This chapter ends with a summary of the results.

Quantitative Research Questions

The study addressed the following quantitative research questions:

RQ1: Were there significant differences in the credibility scores among participants receiving the information across three video genres?

RQ2: Was there a significant relationship between reported time spent watching Internet streaming video and each participant's perceived credibility of information received across three video genres?

Qualitative Research Questions

The analysis of the quantitative data informed the qualitative phase with the emergence of six research questions arising out of the following RQ 3 introduced in Chapter 1: What are college students' perceived credibility of three video genres of the same historical event?

Six questions were asked of two focus groups:

* Focus Group Questions 1: What is *your* definition of credibility?

* Focus Group Question 2: Do *you* think evaluating the credibility of videos is important? Why or Why not?

* Focus Group Question 3: Which video did *you* interpret as being most credible?

* Focus Group Question 4: Which video did *you* see as being most engaging? Why? (NASA documentary, CBS news archival footage, *Apollo 13* film clip)? Why?

* Focus Group Question 5: Do *you* think your ability to evaluate video credibility has improved by spending more time watching Internet streaming video? Why or Why not?

* Focus Group Question 6: Do *you* think that features of videos like sound qualities, music, age of the video influence the credibility of a video? Why or why not?

The following section provides an overview of the demographic data. This is followed by the results and analysis of the quantitative data. The analysis continues by discussing the themes and sub-themes that emerged from the qualitative research. Chapter 4 concludes with a summary of the findings.

Demographic Data

Originally there were 131 possible college student participants. Five decided not to participant and 1 failed to answer numerous questions leaving 125 confirmed participants. This more than met the minimum required number of 28 participants determined by using G*Power software.

The mean age of the participants was 22.88; the median age of participants was 21. There were 97 undergraduates and 28 graduate students. Of the 125 participants, 72% (n=90) were 23 years of age and younger; 14% (n = 17) were between 24 and 28; and 14% (n = 18) were between 29 and 49. Forty percent (n=50) were male, and 60% (n=75) were female.

Table 2

Mean Age, Median Age, and Gender of Participants

Mean Age	Median Age	Number of Females	Number of Males
22.88	21	75	50

The Institutional Research Office of the Western United States University (WUSU) where the study was conducted provided student demographics for the fall 2014 semester. The total enrollment at WUSU was 19,934. The mean age of undergraduate students was 21.7 years of age, and graduate students, 31.9 years of age. There were 52% female and 48% male. There were approximately 75 majors offered. This study's participants included 30 majors. Based on the comparison of the two sets of data, the participants in the study were a representative sample of WUSU.

Use of Social and Digital Media

The questionnaire requested participants disclose their use of digital and social media. There were 12 choices including: email, texting, Facebook, Instagram, Twitter, Linkedin, Internet, YouTube, Netflix, Hulu, Amazon Prime, and online games. The results revealed the percentages shown in Figures 7 and 8.

Percent Use of Internet/Streaming Video Among College Students

N = 125
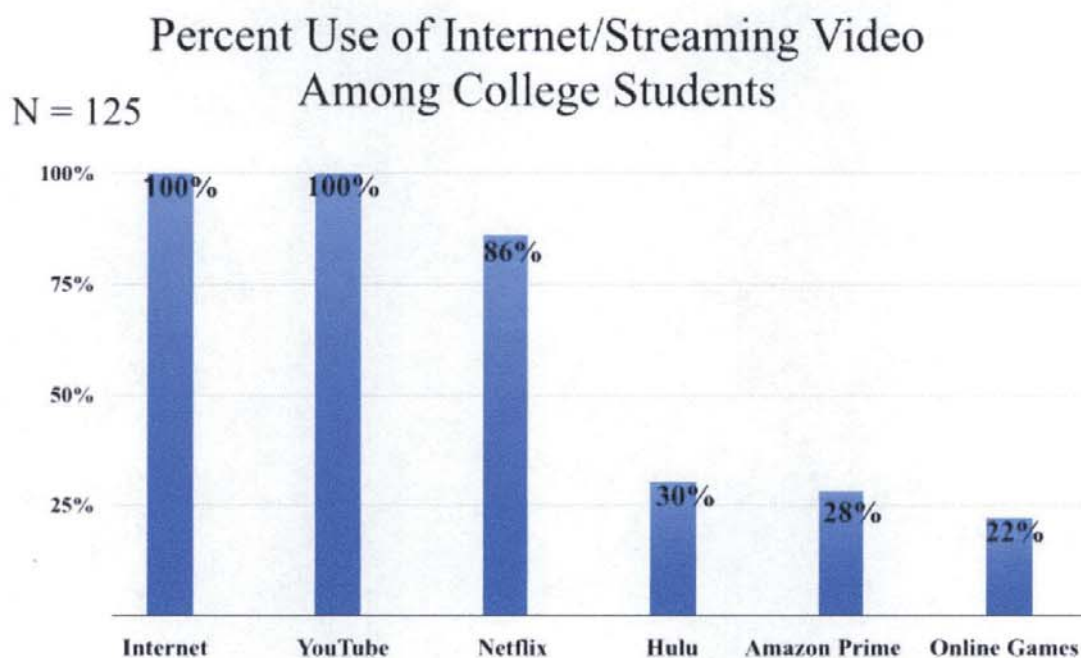
Figure 7: Use of Internet and Streaming Video

The use of streaming video among this study's college student population was 100% as indicated by the fact that all 125 participants specified that they watched YouTube on the Internet. One hundred and eleven (86%) viewed Netflix over the Internet costing $8.99 per month for unlimited streaming of video content. Smaller percentages of the participants used other streaming video services such as Hulu and Amazon.

Digital and social media among the study's participants was similarly widespread. Texting, for example, was universal with 100% application. One hundred and nine (87%) participants used Facebook while eight-four (67%) shared photos on Instagram.

Percent Use of Digital/Social Media Among College Students

N = 125
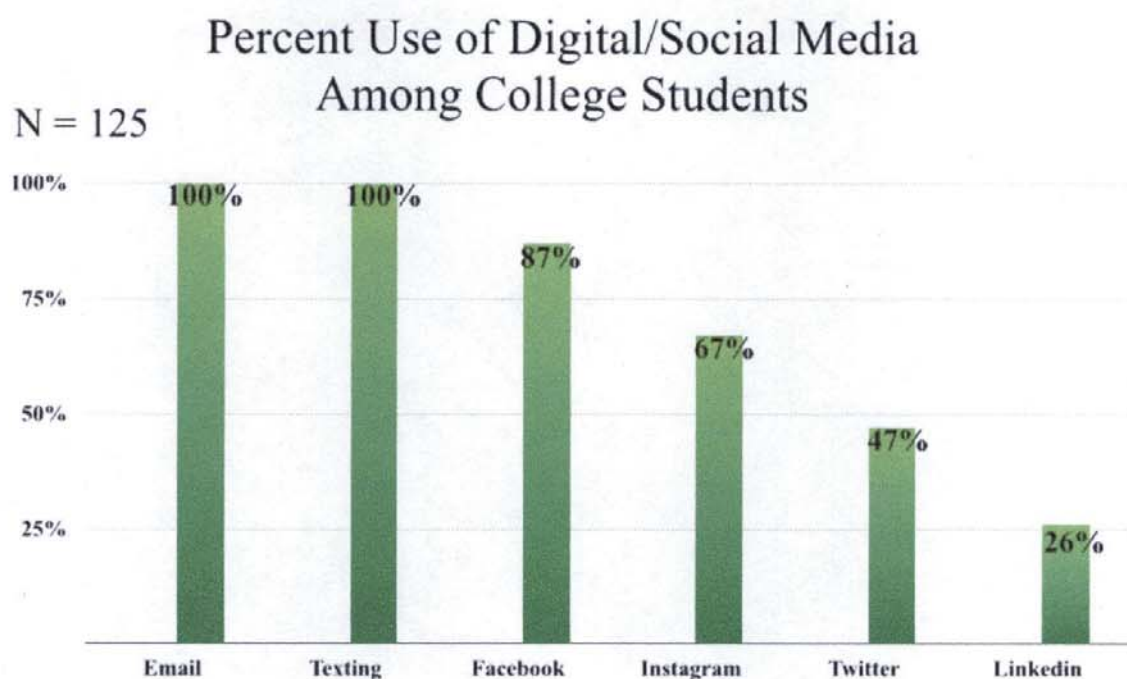
Figure 8: Use of Digital and Social Media

The college student population in this study indicated they were highly digitally connected. Taking into consideration the mean age of 23, most of the participants were members of the net generation. The percentages validate the observational and anecdotal evidence.

Comparing the older generation and the younger generation use of digital media, 96% of the younger generation ages 17-23 used five or more of the 12 digital media checked and 56% of the older generation ages 29-49 used five or more of the 12 digital media (See Figure 9).

Percent of Younger Generation vs.
Older Generation Use of Digital Media
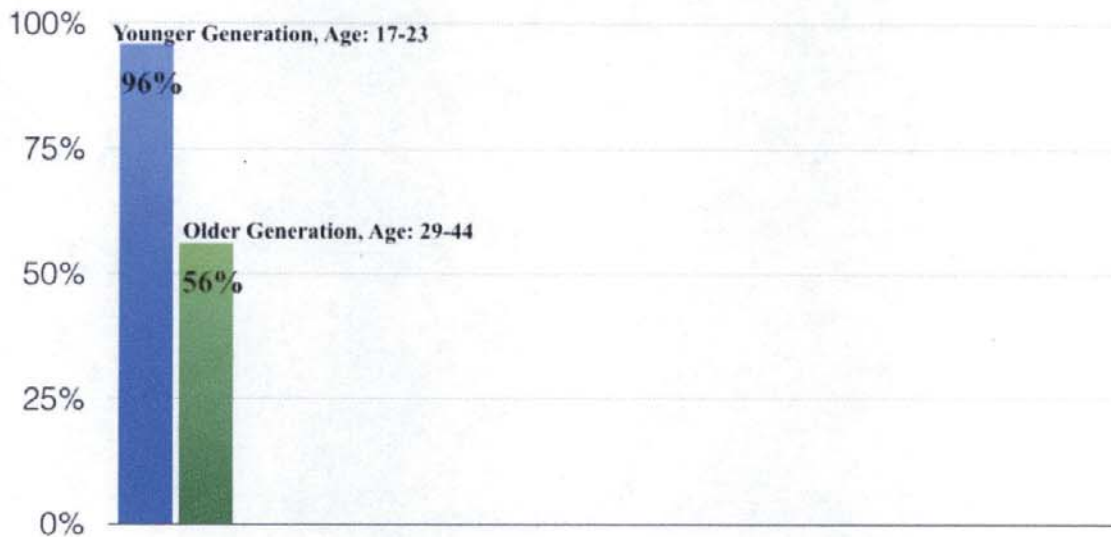
Figure 9: Use of 5 or More of 12 Digital Media

Eighty-six of the study's population were 23 years old or under. Eighty-three reported (96%) using five or more of the 12 digital media asked about on the questionnaire. In contrast, 56% of those 29 years old and over shared the fact that they used five or more of the 12 digital media. There was a 40% greater response from the younger that from the older generation.

The questionnaire had an open-ended query where participants could list other digital media used. Figure 10 helps capture some of the outcomes of the questionnaire. Thirty-six percent of the younger generation reported other digital media used and 17% of the older generation reported additional digital media used.

Percent Younger Generation vs. Older Generation Reported Other Digital Media Used
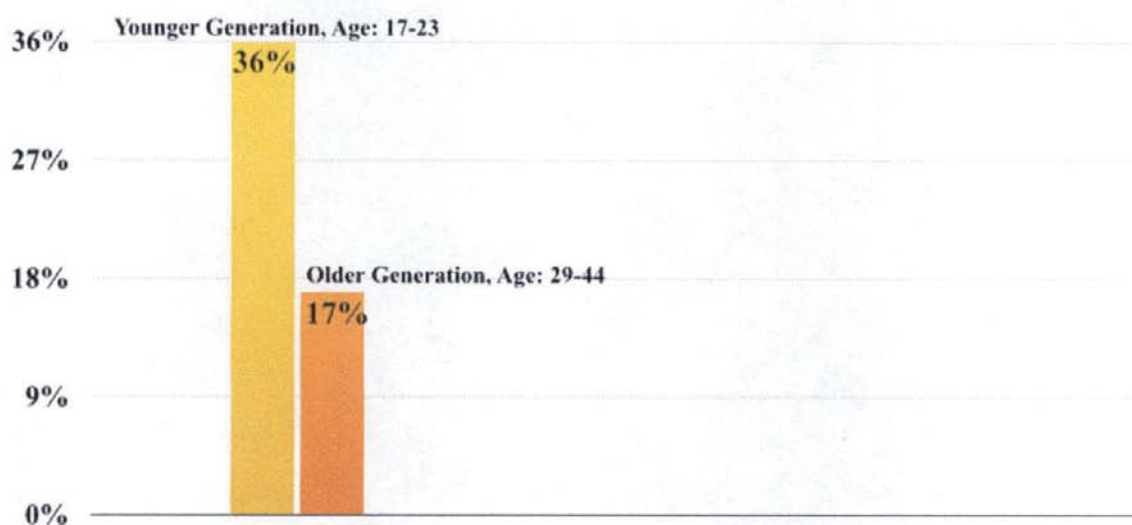
Figure 10: Reported Other Digital Media Used

Further analysis of the 12 digital media used by the participants supports the difference in digital media use between the younger generation and older generation (See Figures 11 and 12). The first bar represents the younger generation (36%) additional use of digital media and the second bar corresponds to reported additional use of digital media by the younger generation (17%). There was more than a 50% difference in additional digital media use further underscoring the generational difference. Figure 11 highlights the generational similarities and differences.

Percent Use of Digital/Social Media
Younger Generation vs. Older Generation

Younger Generation - Blue / Older Generation Green
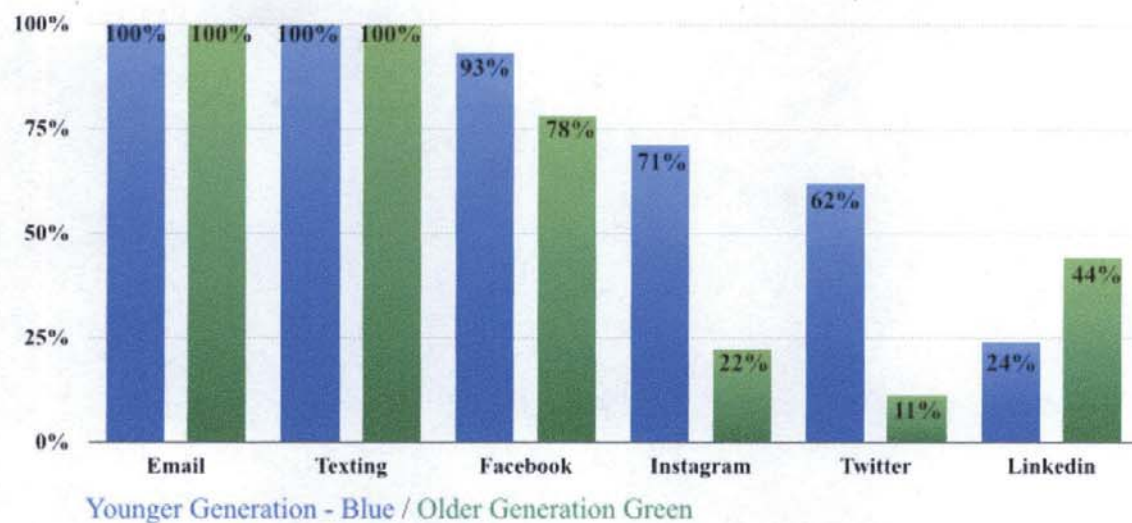
Figure 11: Use of Digital/Social Media by Younger vs. Older Generation

Clearly, both generations make use of email (100%), texting (100%). The

differences were with newer digital technologies such as Facebook (15% difference)

Instagram (a nearly 50% difference) and Twitter (more than a 50% difference).

Linkedin, a business-oriented social network service has been around since 2003. The

older generation's use of Linkedin exceeded the younger generation by 20%.

The reported usage of Internet/Streaming Video, which is the primary focus of

this study, is revealed in Figure 12.

Percent Use of Internet/Streaming Video Younger Generation vs. Older Generation
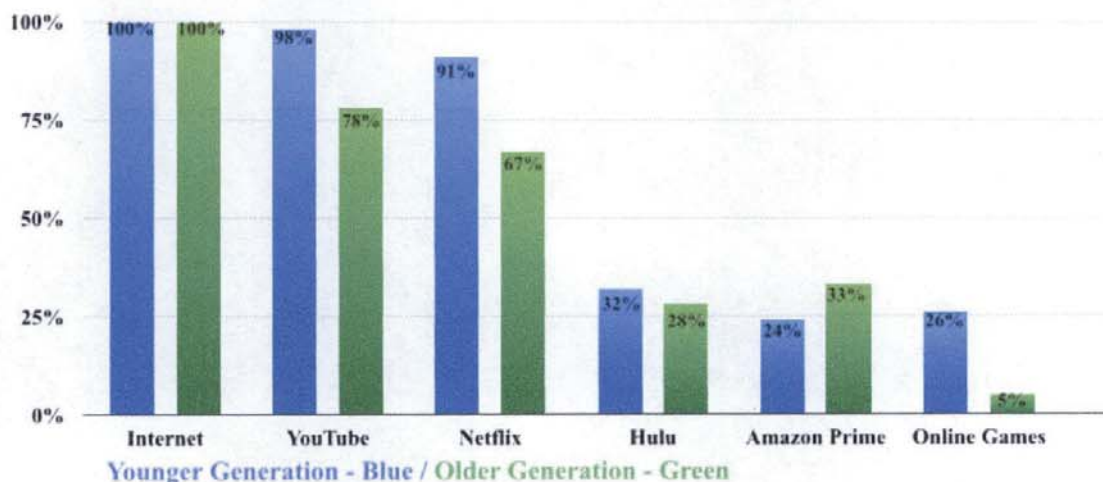
Figure 12: Use of Internet/Streaming Video By Younger vs. Older Generation

Again, the longer a digital technology has been around the more both generations use it. The Internet, for example, reveals both generations reported 100% usage. The more recent streaming video technologies such as YouTube (20% difference), Netflix (24% difference), and online games (21% difference) revealed a greater difference between generations. The apparent exception was the streaming video service Amazon Prime. Amazon.com has been in business since the mid 1990s, becoming a familiar brand by both the younger and older generations.

Data Gathering

Students in five classes took part in the study. Each participant in each class viewed the same three videos of the identical historical event, the launch of Apollo 13. The three video genres were: (1) the official NASA (National Aeronautic Space Administration) documentary; (2) CBS News (Columbia Broadcasting System) archival footage; and (3) a clip from the Hollywood film *Apollo 13*. A smart phone random name

generator application was used to randomly select the viewing order reducing the order effect but not eliminating it.

The order of videos viewed by class were: Class 1 (n= 27): *Apollo 13*, NASA, CBS; Class 2 (n=28): CBS, *Apollo 13*, NASA; Class 3 (n =42): *Apollo 13,* CBS, NASA; Class 4 (n=14): CBS, *Apollo 13*, NASA; and Class 5 (n=14): CBS, *Apollo 13,* NASA.

Each participant viewed each video and then completed the questionnaire. Therefore, each participant completed three questionnaires, which were collected at the end of the session. The data from the questionnaires were analyzed and are reported in the following sections.

Data Analysis

Research Question One: Differences in Perceived Credibility

The participants' total credibility scores were statistically examined to evaluate their perceived credibility of historical information across three video genres. The data were ordinal (i.e., a subjective arithmetical scale that forms a ranking rather than an exact numerical value such as temperature). Thus, a non-parametric Friedman analysis of variance by ranks was used to test the null hypothesis to determine if the repeated measures (dependent variable self-report surveys) "came from the same population or populations with the same median" (Siegel & Castellan, 1988, p. 175).

Median Credibility Scores of Video Genres Among College Students

N = 125

Using the Repeated Measures Design
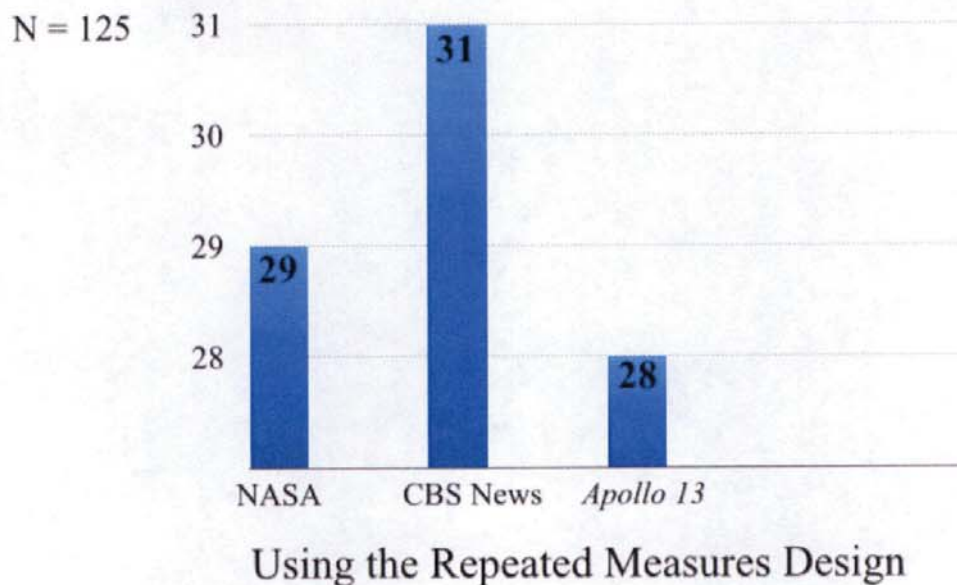
Figure 13: Median Credibility Scores

The median credibility scores for this study were as follows: CBS News = 31, NASA = 29, and *Apollo 13* = 28 (See Figure 13). The median credibility scores were generated by the participant's answers to the 10-question credibility survey. Since a Likert scale of 1-4 was used, the possible range of answers was between 10 and 40

The Friedman Test was administered to determine if there were statistically significant differences in perceived credibility depending on the video genre watched – i.e., NASA video, CBS News video, or *Apollo 13* video. (See Table 3)

Note the Mean Ranks in Table 3. The higher the rank the more that video genre was viewed as credible. The ranking of most credible video genre to least was CBS News 2.27, NASA documentary 2.05, and *Apollo 13* film clip 1.68.

Table 3

The Friedman Test Mean Ranks and Statistics

Mean Ranks	NASA	CBS	Apollo 13	
	2.05	2.27	1.68	
Statistics	N	Chi-Square	df	p
	125	23.611	2	< .001

The results of the Friedman Test (See Table 3) indicated a statistically significant difference in perceived credibility depending on the video genre watched, $p < .001$. However, we only know that at least one pair of genres significantly differed.

Multiple Comparison Test

In order to determine which pairs of video genres differ, a post-hoc analysis using a multiple comparison formula using the mean ranks was applied (Siegal & Castellan, 1988). The differences between CBS News and *Apollo 13* and NASA and *Apollo 13* were significant because they were equal to or greater than the critical value of .3036 that resulted from solving the formula. However, since the difference between CBS News video and the NASA video were not equal to or greater than the critical value of .3036, it was not significant. Figure 14 provides a snapshot of the results of the Friedman Analysis of Variance by Ranks Test and the Multiple Comparison Test using the mean ranks.

Mean Ranks - Perceived Credibility of
Video Genres Among College Students

N = 125

2.05 (NASA)

2.27 (CBS News)

1.68 (Apollo 13)

Post Hoc Multiple Comparison Test
recommended by Siegel and Castellan
following a significant Friedman Test
$p < .001$

NASA vs. CBS n.s
NASA vs. *Apollo 13* sig.
CBS vs. *Apollo 13* sig.

NASA   CBS News   *Apollo 13*

Non-Parametric Friedman Analysis of Variance by Ranks
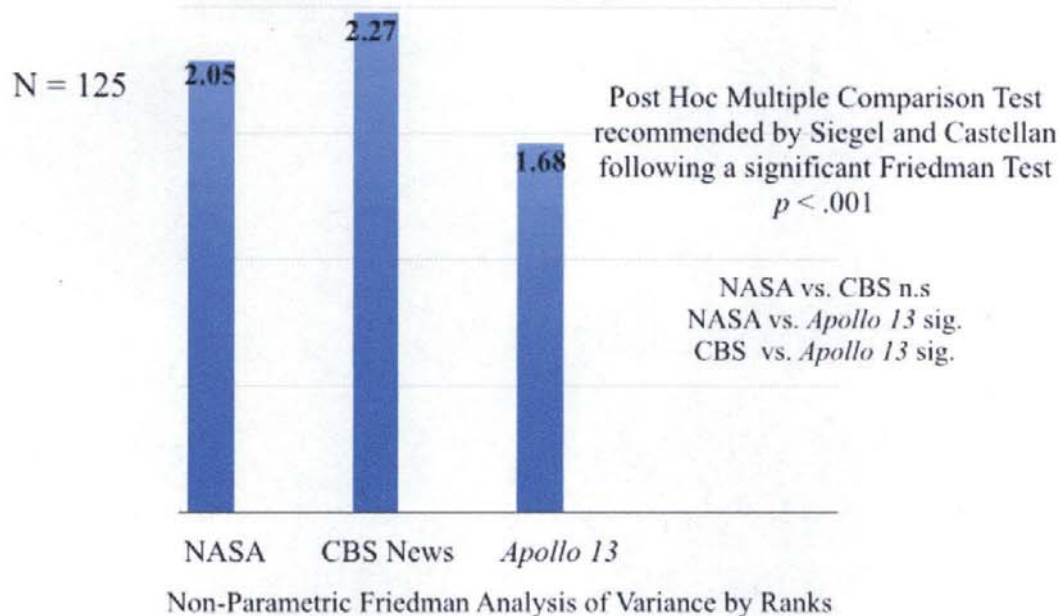
Figure 14: Results of the Multiple Comparison Test Using the Mean Ranks

Emergent Credibility Questions

This study used a mixed method sequential design framed in a theory where the quantitative data analysis informed the qualitative data analysis. After examining the quantitative data from RQ1, three additional sub-questions emerged that could better highlight the examination of the data generated by the two focus groups.

1: Were there significant differences in interpretation credibility scores among participants receiving the information across three video genres?

2: Were there significant differences in prominent credibility scores among participants receiving the information across three video genres?

3: Were there significant differences in the engagement credibility scores among participants receiving the information across three video genres?

Differences in Perceived Interpretation and Prominent Credibility

Sub-questions 1 and 2 reflect the fact that the total credibility scores combined

five interpretation and five prominent credibility questions as per Prominence-

Interpretation Theory. In order to answer sub-questions 1 and 2, the interpretation and

prominent credibility scores were subjected to the Friedman Test for significance. Both

were statistically significant, p < .001, supporting the statistical findings of RQ 1.

Even though there were significant differences in perceived interpretation and

prominent credibility in at least one pair of genres the Friedman Test does not disclose

where other differences have occurred. In order to determine where possible other

differences occurred, a post-hoc analysis using a multiple comparison equation that used

the mean ranks was answered (Siegal & Castellan, 1988).

Mean Ranks - Perceived Interpretation Credibility of Video Genres Among College Students

N = 125

2.55
2.05
1.25

NASA   CBS News   Apollo 13

Post Hoc Multiple Comparison Test recommended by Siegel and Castellan following a significant Friedman Test

$p < .001$

NASA vs. CBS sig.
NASA vs. *Apollo 13* sig.
CBS vs. *Apollo 13* sig.

Non-Parametric Friedman Analysis of Variance by Ranks
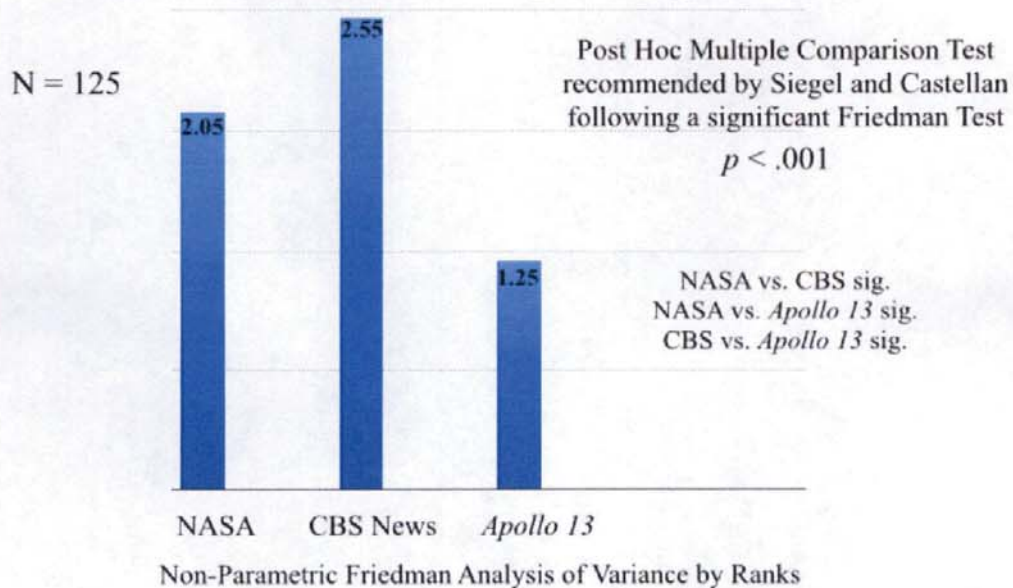
Figure 15: Results of the Multiple Comparison Test Using Mean Ranks – Interpretive Credibility

The differences between CBS News and NASA, CBS News and *Apollo 13* and

NASA and *Apollo 13* were all significant because they were equal to or greater than the

critical value of .3036 that resulted from solving the formula. (See Figure 15).

The Siegal & Castellan post-hoc test was also applied to explore prominent

perceived credibility scores resulting in differences between CBS News and *Apollo 13*

and NASA and *Apollo 13* but not significant between CBS and NASA (See Figure 16).

Mean Ranks - Perceived Prominent Credibility of Video Genres Among College Students

Non-Parametric Friedman Analysis of Variance by Ranks
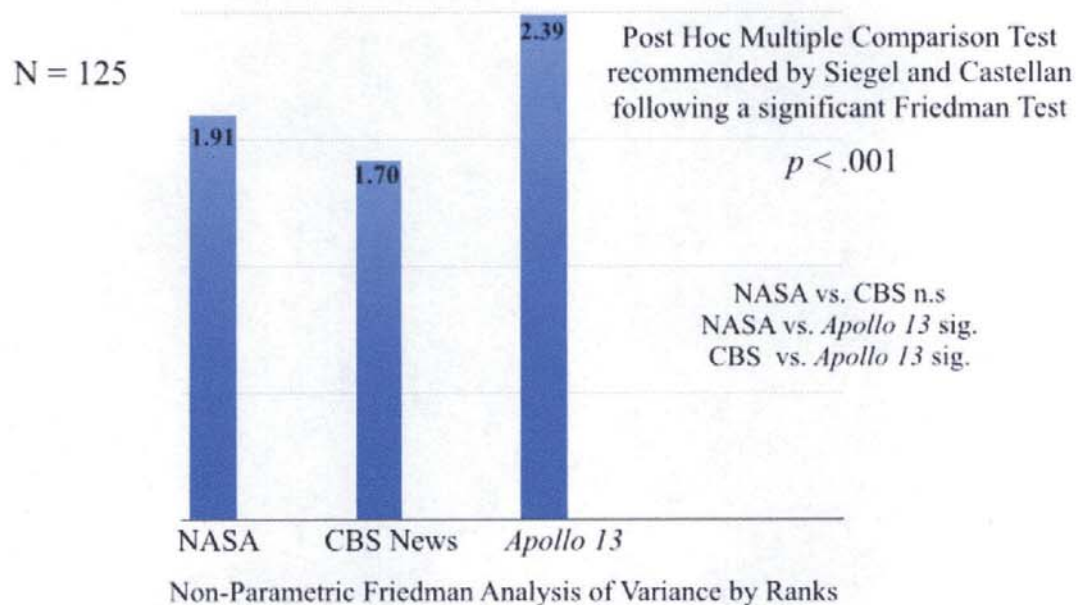
Figure 16: Results of the Multiple Comparison Test Using Mean Ranks – Prominent Credibility

After examining the data, it appeared that the results were the same as the total

combined credibility scores. However, the rankings are reversed with the Mean Ranks as

follows: Apollo 13 = 2.39, NASA = 1.91, and CBS = 1.70. Again, combining

interpretive and prominence generated more robust data.

Differences in Perceived Engagement Credibility

Repeatedly throughout Chapter 2, the importance of student engagement was highlighted, giving rise to sub-question : Were there significant differences in the engagement credibility scores among participants receiving the information across three video genres? It would be expected that the viewing of the *Apollo 13* clip would be the most engaging due to multimodality and prominence.

Mean Ranks - Perceived Engagement Credibility of Video Genres Among College Students

N = 125

2.46

Post Hoc Multiple Comparison Test recommended by Siegel and Castellan following a significant Friedman Test

$p < .001$

1.81

1.74

NASA vs. CBS n.s
NASA vs. *Apollo 13* sig.
CBS vs. *Apollo 13* sig.

NASA   CBS News   *Apollo 13*

Non-Parametric Friedman Analysis of Variance by Ranks
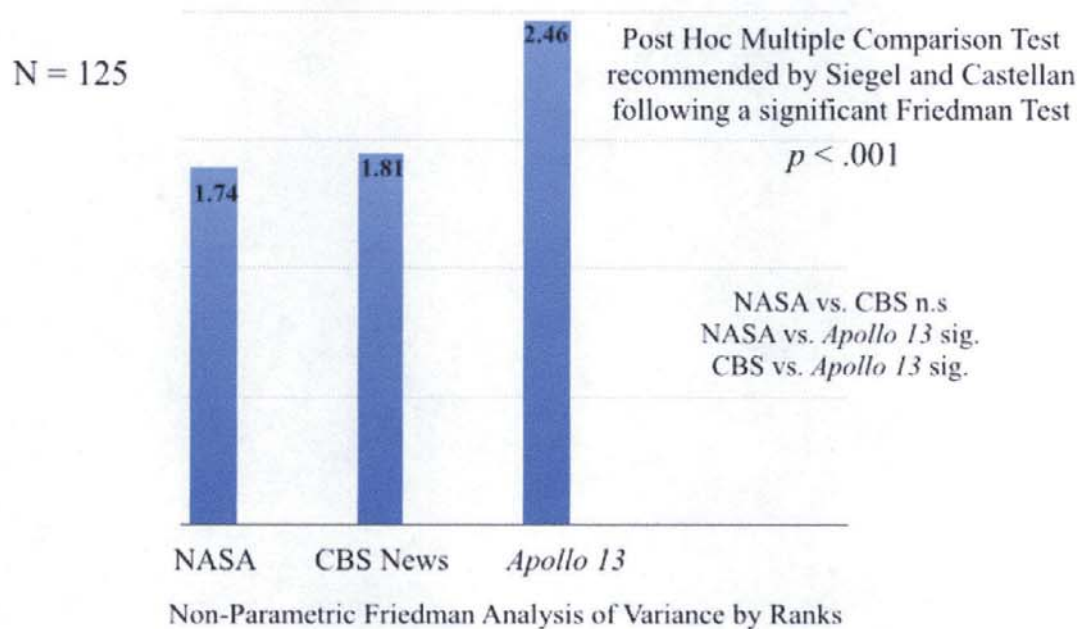
Figure 17: Results of the Multiple Comparison Test Using Mean Ranks – Engagement Credibility

Running the Friedman Test focusing only on question 6 of the survey instrument, *how engaged were you in the viewing*, the results were significant, $p < .001$. *Apollo 13* was the most engaging with the Mean Ranks as follows: *Apollo 13* = 2.46, CBS News = 1.81, and NASA = 1.74. The same post-hoc test above was used to find where the differences lie. The differences between CBS News and *Apollo 13* and NASA and

Apollo 13 were significant. Conversely, the difference between CBS News and NASA was not significant (See Figure 17).

Research Question Two: Credibility and Hours Per Week Watching Streaming Video

Answering RQ2 required running a statistical correlation between participants' estimated hours per week watching streaming video and participants' credibility scores. The original data contained one outlier. One participant reported watching streaming video 100 hours a week skewing the average hours per week higher to 12.67 hours. After the removal of the outlier, the average time watching streaming video was decreased to 11.94.

A non-parametric correlation test was applied using Spearman's rho. The results were significant, $p = .030$ (See Table 4), meaning there is less than a 3% chance that the relationship between hours per week watching streaming video and credibility scores happened by chance. However, significance does not provide any information on the strength of the relationship. The correlation coefficient (r) of .194 (See Table 4) indicates a small effect size.

Table 4

Statistical Correlation Between Hours Per Week Watching Streaming Video And Participants' Total Credibility Scores

Number of Participants	Correlation Coefficient	Significance	Effect Size
125	.194	0.03	.20

* Correlation is significant at the 0.05 level

Hours Per Week Watching Streaming Video Among College Students

There is a significant correlation between hours per week watching streaming video and perceived credibility scores among college students $p = .030$
The effect size is small, .20
Correlation Coefficient = .194
Using the Non-Parametric Spearman's Rho

N = 125

11.94 Hours
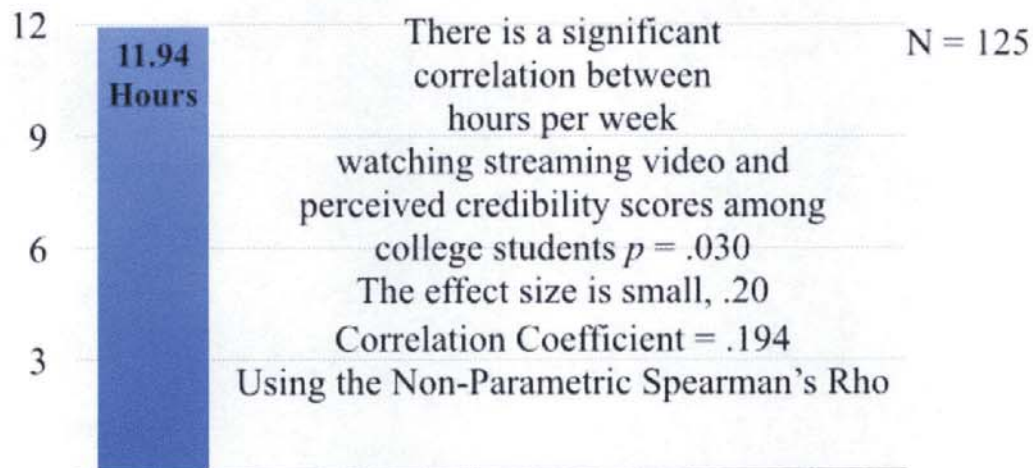
Figure 18: Hours Per Week Watching Streaming Video and Credibility

For an overview of the nonparametric Spearman Rho correlation test see figure 18. Although the relationship is statistically significant, the effect size is small, .20. Therefore, the practical significance needs to be considered before making any generalizations to a population.

The survey also included a query: Estimate the number of hours you have viewed video on Apollo 13 including the movie *Apollo 13*, and/or documentary footage of Apollo 13. The reasoning for this inquiry was to determine if those who had more past experiences with Apollo 13 videos had greater total credibility scores. This could have resulted in misleading total credibility scores by numerous participants.

A non-parametric correlation test was applied using Spearman's rho addressing the question: Was there a significant relationship between reported time spent watching Apollo 13 videos and each participant's perceived credibility of information received

across three video genres? The results were not significant. It might be added that 63 of the 125 participants (50%)had one hour or less time watching Apollo 13 videos.

Qualitative Data

Overall, this study inquired into what are college students' perceived credibility of three video genres. Since this study is a mixed method sequential design where the quantitative data informs the qualitative research, the creation of the two focus groups was suggested by the quantitative data. Based on the generational differences highlighted by the use of digital media generated by the quantitative analysis, the decision was reached to further explore the differences qualitatively by having Focus Group One (n=11) be made up a younger generation (mean age = 18.5) and Focus Group Two (n =5) composed of an older generation (mean age = 36.5).

Six questions were derived from this analysis. The first question was: What is *your* definition of credibility? The quantitative questionnaire had ten questions designed to statistically measure perceived credibility by asking about accuracy, bias, trust, fairness, comprehensiveness, engagement, likeability, background knowledge, learning style appeal, and motivation. By gathering in focus groups, the researcher had the opportunity to ask participants directly how *they* defined credibility.

The second question was: Do *you* think evaluating the credibility of videos is important? Why or Why not? This question afforded the researcher the opportunity to learn what the participants had to say about the importance of credibility.

The third question was: Which video did *you* interpret as being most credible, the NASA documentary, the CBS news archival footage, or the *Apollo 13* film clip? Why?

This question emerged from results of the non-parametric Friedman analysis of variance by ranks test used to evaluate significant differences in participant's perceived credibility.

The fourth question was: Which video did *you* see as being most engaging? Why? This question was asked to explore more closely survey question six: How engaged were you in the viewing? The focus group environment provided an opportunity for students to state which video was most engaging. This outcome served as a comparison point to statistical data yielded by the survey.

The fifth question was: Do *you* think your ability to evaluate video credibility has improved by spending more time watching Internet streaming video? Why or Why not? This question emerged from quantitative research questions 2: Was there a significant relationship between reported time watching streaming video and each participant's perceived credibility of information received across three video genres? The statistical data determined there was a significant relationship. The focus group provided the prospect of comparing the quantitative with the qualitative.

The final question was: Do *you* think that features of videos like sound qualities, music, age of the video influence the credibility of a video? Why or why not?. This question stemmed from the opened ended survey question: comments, thoughts, suggestions, etc. The analysis of the 37 participants who responded to comments, thoughts, and suggestions revealed a set of patterns that fed into the subcategories of sound quality, music, and a video's age.

Demographics: Focus Groups

Focus Group One (n=11) were composed of all undergraduates who had a mean age of 18.5. Nine were 18, one was 17, and one was 24. There were eight science-

related majors and included biology, chemistry, engineering, and nursing. The other majors were accounting, business, and geography. There were ten females and one male in Focus Group One.

Focus Group Two (n=5) were all graduate students with a mean age of 36.5. Two were in the forties, two in the thirties, and one in the twenties. There were five science-related majors who included biology, general science, and animal science. There were four females and one male in Focus Group Two.

Table 5

Mean Age and Gender

	Focus Group One (n=11)	Focus Group Two (n=5)
Mean Age:	18.5	36.5
Females:	10	4
Males:	1	1

The focus group participants were randomly selected from those who volunteered during the data-gathering phase of the study. The potential focus group participants were divided into two sample groups, younger generation (Focus Group One) and older generation (Focus Group Two).

When the focus group participants arrive at the pre-selected location on campus at WUSU, they were asked to select a pseudonym. They wrote the pseudonym on a large notecard, created a table tent, and displayed it so everyone could see it.

The researcher set up a cassette tape in the middle of the table. The recorder was turned on after the introductions and pseudonyms were selected. The recorder was turned

off after the session was completed (70 minutes). The voice recordings were converted to text by a professional transcriber. The entire text between the two focus groups consisted of 34 pages.

Question 1

The central theme of question one was *credibility defined* derived from the question: *What is your definition of credibility.* In order to sort out the sub-themes a "generic approach to coding" was followed using a six-step process (Lichtman, p. 258).

Step 1: Initial coding. Going from responses to summary ideas of the responses

Step 2: Revisiting initial coding

Step 3: Developing an initial list of categories

Step 4: Modifying initial list based on additional rereading

Step 5: Revising your categories and subcategories

Step 6: Moving from categories to concepts (Lichtman, p. 252).

This same 6-step process was applied to each focus group's questions.

Colors for each of the sub-themes were selected to generate the color portraits. These colors contributed to the analysis of the sub-themes. The following are the colors and sub-themes that emerged from the analysis of the Question 1 responses:

Sub-Theme	Color
Trusted Source/Expert	Green
Factual	Red
Not Misleading	Blue
Unbiased	Yellow

| Believable | Orange |
| Straight Information | Indigo |

The coding scheme was then duplicated in MAXQDA qualitative coding software and assigned colors. The colors selected for each sub-theme are indicated above. The two transcripts, one for each focus group for question one, was uploaded into MAXQDA. Then, while reading the text again, the color assigned to each sub-theme was used to highlight those parts of the text. This resulted in two document portraits, one for each focus group (See Appendix E).

Looking at the document portraits, two sub-themes stood out, green and indigo, *trusted source/expert* (green) and *straight information* (indigo). The percentages of the document portraits were as follows: *trusted source/expert* Focus Group One - 30% and Focus Group Two - 33% and *straight information* Focus Group One – 18% and Focus Group Two – 28%.

Anna from Focus Group One defined credibility, as "Basically a source that you can trust and that you know will not mislead you in any information that they provide." She was asked by the researcher, "How do you know you can trust them? She replied, "Basically by the organization – if they have a good reputation. I just need to research them, basically." The researcher followed that response with, "How would you do that?" Anna replied, "You could look them up on the Internet to start, just to get a general idea of who they are and what they do. Find their past works and see if those are trustworthy also."

Laquanda from Focus Group 2 defined credibility similarly. "The first thing being like does the individual representing this information have either the intelligence,

education, or the experience to actually represent those facts on their own? And then what is their like past record, what's the frequency that other people rely on that source? How consistent are they with other people presenting the same information?"

Abby from Focus Group One defined credibility as, "I think it's also; credibility is something that's measured whatever to its true value of what it's trying to measure. The exact measurement of whatever the subject is trying to measure." This was assigned the sub-theme straight information.

Chantelle expressed Focus Group Two's version of *straight information.* "I tend to think that to be credible the source has to be interested in presenting stock [archival footage] only, good and bad. Just presenting the information in a way that the user [viewer] or the consumer can take the information and process it how they think."

Looking strictly at the frequencies of the codes highlighted in both texts, *trusted source/expert* ranked first with 11 (34.5%). *Unbiased and factual* tied for second with 6 (19%). *Straight information* was third with 4 remarks (12.5%). *Believable,* orange (18% of the document portrait and a frequency of 2 – 15.5%), was emphasized by Emma in Focus Group One. "It's just anything believable." Focus Group Two participants did not include believable in their definition.

Question 2

The pivotal theme of question two was *importance evaluating video credibility.* It revolved around the focus group question: *Do you think evaluating the credibility of videos is important? Why or Why not?.* The same sorting process applied to Question 1 was applied to Question 2 and the remaining four focus group questions.

The color assigning process to sub-themes created color portraits. The responses to Question 2 were highlighted with the following colors contributing to the analysis.

Sub-Theme	Color
To learn what's factual, what's not	Red
To avoid misconceptions/wrong conclusions	Orange
To be aware of biases	Green
To prevent dumbing down	Blue
To avert being manipulated	Violet

The text for question two was uploaded to MAXQDA and the sub-themes were coded with the colors. See above sub-theme list and corresponding colors. Two document portraits were created.

The highest percentage color in the Focus Group One's document portrait was violet (38%), *to avert being manipulated.* This was followed by red (35%), *to learn what's factual, what's not* and orange (23%), *to avoid misconceptions/wrong conclusions.* Focus Group Two's highest percent color was green (35%), *to be aware of biases.* This was followed closely by orange (33%), *to avoid misconceptions/wrong conclusions.*

George from Focus Group One had the most to say on the importance of credibility sub-theme *to avert being manipulated.*

I think it's very important because especially if you're forming an argument

off of the film because if the video is unreliable or uncredible then your

engagement can be swayed either way, so, for instance, if the filmmaker is

trying to convince you of something and you make an argument off of something that's uncredible you can be basing your argument on something that is not factual. I think a lot of the times that people who are trying to convince you of something are trying to convince you that they're credible, even if they're not. So I think that one of the main challenges for, especially, in say, like documentaries, is to convince you that they're credible and then convince you of their argument. So I think trying to differentiate between credibility and then perceived credibility is very important."

A representative response to the importance of evaluating video credibility rested on the sub-theme: *to learn what's factual, what's not* came from Argee. "Yes, well, I believe in evaluating the credibility of videos is important, especially in a school setting or in a learning environment because when you're showing a video to students you want them to get knowledge out of it.

Hope from Focus Group Two thought it was important to be aware of bias. She commented, "It [a video] could be biased on what they're showing, even in the news – a lot of news actually is biased one way."

Both focus groups remarked on the sub-theme: *to avoid misconceptions/wrong conclusions*. Group One was 23% and Group Two was 33%. Chauntelle from Focus Group Two had the most to offer on avoiding misconceptions and wrong conclusions. "It absolutely is because you will, if you just watch Hollywood film movies about historical events, there's going to be a lot of misconceptions because they're doing things to make money and they're going to show things, I mean there's a lot of film clips that show events that didn't actually happen or they kind of like based on this but not 100%

accurate. So you can gain a lot of misconceptions from watching these and not know what the real story is."

The descriptive statistics included 29 highlighted codes between the two groups. Red, *to learn what's factual and what's not* (28%), had the most highlights with 8. Orange, *to avoid misconceptions/wrong conclusions* (24%), had 7 highlights. Violet, *to avert being manipulated* (17%), was third with 5.

Question 3

Question 3, *which video did you interpret as being most credible and why*, emerged with seven sub-themes. Again, colors were chosen enhancing the sub-theme analysis of Question 3.

Sub-Theme	Color
NASA	Red
CBS	Orange
Apollo 13	Gold
Torn between NASA/CBS	Green
Unbiased	Blue
Reporting facts/less edits	Violet
Less music, drama, emotions	Purple

Question 3 had the most responses (n=67) of the six focus group questions. Focus Group One found the CBS News footage, orange, the most credible (n=6) while Focus Group Two believed the NASA clip, red, to be most credible (n=5). Both groups were somewhat torn between the NASA documentary and the CBS News footage being most credible. The code color green was assigned *to torn between NASA/CBS* Focus Group

One had two that were torn and Focus Group Two had 4 that had difficulty deciding. The *Apollo 13* clip, gold, received no reactions for most credible (n = 0).

Viewing the document portraits both groups agreed on the key reason a video was credible had to do with sub-theme *reporting facts/less edits*, violet. Focus Group One had 35% violet and Focus Group Two produced 23% violet. George from Focus Group One stated, "I think the CBS archival footage because it was there, there weren't as many as like scene-cuts and things where they could have different arguments by putting the two different clips right next to each other." Samantha from Group One added, "I think the CBS one was credible because like you [referring to another focus group member] said it was just one continuous clip."

Focus Group Two responded similarly. Hope echoed George, "CBS News archival footage just seemed to be regular footage." Chauntelle added, "I think the news footage is more on just reporting."

Purple, sub-theme *less music, drama, emotions*, figured highly in the document portraits, group one (25%) and group two (18%). Callie from group one said, "*Apollo 13* is least credible because … the music and the way they [director/producer] put their film together." Abby agreed, "Well, since it's [NASA] reenacted, expressions might not be the same exact expressions that happened during the time."

Focus Group Two's take on sub-theme *less music, drama, emotions* included a statement by Hope. "The NASA documentary had like the dramatic music … the CBS archival footage just seemed to be regular footage without any music or drama or anything." Chauntelle reiterated Hope by saying, "There was no music there [CBS]."

The sub-theme statistics mirrored the document portraits with 23 mentions related to the sub-theme *reporting facts/less edits* representing 34% of the 67 responses. Sub-theme *less music, drama, emotions* was second with 18 comments (27%). Both focus groups had the same order of most sub-theme frequencies with *reporting facts/less edits* first and *less music, drama, emotions* second.

Question 4

The same steps were repeated for question 4 theme: *video most engaging and why.* The sub-themes that emerged and the colors assigned were as follows:

Sub-Theme	Color
NASA	Red
CBS	Orange
Apollo 13	Gold
Torn Between *Apollo 13*/NASA	Yellow
Has music, drama, emotions	Green
Real peoples' stories/expressions	Violet
What actually happened	Purple

The groups mutually agreed that *Apollo 13*, gold, was the most engaging with 6 of 11 group one participants and 4 of 5 group two participants. Focus Group One gave CBS, orange, one vote. NASA, red, and *torn between Apollo 13/NASA*, yellow, received zero acknowledgements as being the most engaging. Focus Group Two saw things differently. They were not as definitive about *Apollo 13* being most engaging. One participant considered NASA most engaging. While another group participant was somewhat torn between *Apollo 13*/NASA and CBS.

Examining Group One's document portrait, green, *music, drama, emotions,* highlighted 39% of the portrait. Looking strictly at a numerical count of green coding, the count mirrored the portrait with a frequency of 38%.

Abby commented, "I believe even though *Apollo 13* is not considered the most credible I believe it is the most engaging because of the music; it may set a mood or it may set the tension of it to be more engaging towards the audience." Anna concurred that *Apollo 13* was most engaging. She noted, "I agree with *Apollo 13* being most engaging just because you could see the emotions of the astronauts inside the shuttle and see the emotions of those watching the launch also."

The order of document portrait color percentages for Focus Group One followed with purple second, sub-theme *what actually happened,* and gold third, *Apollo 13,* with 23% and 20% respectively. It was previously mentioned that Focus Group One saw *Apollo 13,* gold, as most engaging. Callie, however, saw things differently than her fellow participants; perceiving *what actually happened,* purple, as most engaging. She explained, "The CBS archival footage was the most engaging to me because I couldn't help but feel the rest of them [Apollo 13 and NASA] were fake. So I kept distancing myself from the actual footage because I'm just like 'this isn't real, you know, I want to watch the real footage'."

Scrutinizing document portrait 2, the sub-themes, in order of importance, were green (23%), *has music, drama, emotions,* violet (15%), *real peoples' stories/expressions,* and purple (13%), *what actually happened.* The sub-theme coding count turns out to follow a different order with the sub-codes *has music, drama, emotions* (39%), *what actually happened* (15%) and *real peoples' stories/expressions* (12%).

Hope's statement illustrates the number one sub-theme from Focus Group Two –

music, drama, and emotion make a film/video engaging. "The *Apollo 13* film clip was

definitely the most engaging because you have the music, you have the visuals that are

very dramatic of the, you know, the launch with the things blown off of the rocket and

the fire. And then you see the peoples' emotions from it and you hear the music in the

background, so I think it's playing to more of your senses."

As with Focus Group One, not everyone saw *Apollo 13* as most engaging. "This is

Laquanda, and I said the CBS archival footage was most engaging, and it was because it

like felt real, like it was taking a snapshot of reality." An example of sub-theme *what*

actually happened. Roxanna's response took a similar but different angle. "I found the

NASA one to be the most engaging ... for some other reasons where I thought seemed

actual peoples' expressions."

Question 5

The participants were asked: Do you think your ability to evaluate video

credibility has improved by spending more time watching Internet streaming video?

Why? or Why not?

This question had the least number of responses between the two groups with 9.

They were divided between two sub-themes*: yes, practice makes perfect* (red) and *no,*

leads to confused thinking (green).

Sub-Themes	Color
Practice Makes Perfect	Red
No, Leads to Confused Thinking	Green

Looking at the document portraits, Focus Group One was divided with 65% *yes, practice makes perfect* and 45% *no, leads to confused thinking.* Focus Group Two was more evenly divided with 52% going with *leads to confused thinking* and 48% preferring *yes, practice makes perfect.*

The frequencies afforded a different perspective with Focus Group One having an evenly divided view of 50/50. The frequencies of Focus Group Two were 60%, sub-theme *no, leads to confused thinking* and 40% *yes, practice makes perfect.* The two groups combined to generate 56% *no, leads to confused thinking* and 44% *yes, practice makes perfect.*

Abby from Focus Group One spoke stating, "Like the saying goes 'practice makes perfect,' so I believe watching more videos has improved us being to evaluate the videos' credibility or not because of the amount of movies we watch we can start to differentiate between the film is a movie or if it's actually a reality from the real video clip, so yes, I do believe that watching more videos online has increased our ability to evaluate video credibility."

Laquanda from Focus Group Two agreed. "I feel like it's improved my ability, and I think it's because of your sample size of what you're viewing has gotten so big – you can really see some examples of what makes something good versus bad quality, and you can start to recognize patterns that maybe you can recognize something sooner now rather than maybe if you hadn't had so much access to so much contact."

Focus Group One's Callie responded conversely, "I kind of think it to be the opposite because we watch so many fake things that we become, we get this idea that

that's what reality is, and that's what we see as reality. So I think that our credibility can be diminished that way."

Focus Group Two's Hope agreed. "You never know if anything's real out there. And I just think it can really muddle with your own critical thinking process by all the differences that they put in videos. So, I just have a bad taste in my mouth about all this."

Question 6

Finally, the participants were asked: *Do you think that features of videos like sound qualities, music, and age of the video influence the credibility of a video? Why or Why not?*

Three sub-themes and the corresponding colors became apparent from a qualitative analysis.

Sub-Theme	Color
Music/sound influence credibility	Red
Video time period puts in context	Gold
Video age mistaken/misleading credibility	Blue

The two portrait documents resulted in different and similar visuals. Focus Group One emphasized sub-theme *video age mistaken/misleading credibility* with 48% blue. In contrast, Focus Group Two had 16% blue. Focus Group Two stressed sub-theme *video time period puts in context* with 63% gold. Focus Group One commented 32% on this sub-theme. Both groups highlighted the sub-theme *music/sound influence credibility* about the same with 21% and 20% red, Focus Group One and Two respectively.

Argee from Focus Group One weighed in on sub-theme *video age mistaken/misleading credibility* (48%, blue) "Smoking in the mid-1900s was accepted

and widely broadcast in advertisements and everything, and now that we know it's like bad for you, causes lung cancer, it's like a different message is being conveyed. So age really matters."

Antonio from Focus Group Two shared his perspective on sub-theme *video time period puts in context* (63%, gold). "My thought is it seems like the sound quality, the age, things that represent age of the video helps how a person out that video in context as far as is this information up to date or one thing or are we looking at something to see how people thought then or are we looking at something to see where we're at now? So, I think it puts it in context."

The sub-theme statistics combining both groups gave rise to *video time period puts in context* 52%, *video age mistaken/misleading credibility* 26%, and *music/sound influence credibility* 22%. Looking at the sub-themes statistics by group, it turned out differently. Focus Group One's percentages were sub-theme *video time period puts in context* 52%, *video age mistaken/misleading credibility* 26%, and *music/sound influence credibility* 22%. Focus Group Two also had *video time period puts in context* as the most frequent sub-theme with 46%. The other two sub-themes, *video age mistaken/misleading credibility* and *music/sound influence credibility*, tied at 27%.

Summary

This chapter reported the results and analysis of answering the research questions. Moreover, demographic data were described and analyzed. The following recaps the outcomes of following the sequential mixed method design.

Quantitative

In order to answer research question 1 a non-parametric Friedman Test was used. The results indicated a statistically significant difference in perceived credibility of $p <$ .001. A post-hoc test revealed there were significant differences between CBS News and *Apollo 13* and NASA and *Apollo 13*. The difference between CBS News and NASA was not found to be significant.

In order to answer research question 2 non-parametric correlation test was applied using Spearman's rho. The results were significant, $p = .030$. On the other hand, the effect size was small, .20.

Qualitative

This study was a mixed method sequential design where the quantitative data informed the qualitative phase. Consequently, two focus groups were created. Focus Group One was made up of younger participants and Focus Group Two of older participants.

Six focus group questions emerged from the quantitative data analysis:

Question 1: What is *your* definition of credibility?

Question 2: Do *you* think evaluating the credibility of videos is important? Why or why not?

Questions 3: Which video did *you* interpret as being most credible? Why?

Question 4: Which video did *you* see as being most engaging? Why?

Question 5: Do *you* think your ability to evaluate video credibility has improved by spending more time watching Internet streaming video? Why or why not?

Questions 6: Do *you* think that features of videos like sound quality, music, age of the video influence the credibility of a video?

The data revealed the focus group participants' defined credibility as *a trusted source/expert* and *straight, factual information.* Both groups emphasized the importance of evaluating video credibility in order *to avert being manipulated* and *to be aware of biases.* The focus groups saw the CBS News footage and the NASA documentary as most credible. The *Apollo 13* clip received no responses for being most credible.

On the other hand, both groups considered Apollo 13 most engaging. The focus group participants were divided on the question of improving credibility evaluation over time. Fifty-six percent said *no, leads to confused thinking* and 44% answered *yes, practice makes perfect.* Focus Groups One and Two weighed in differently on the final question of *video sound quality, music, age influencing credibility.* Focus Group One emphasized the sub-theme *video age mistaken/misleading credibility* and Focus Group Two stressed sub-theme *video time period puts in context.*

The next chapter will discuss the findings, implications, and recommendations.

CHAPTER FIVE: CONCLUSIONS AND IMPLICATIONS

The primary purpose of this dissertation was to investigate the perceived credibility among college students from three video genres: (1) documentary footage, (2) archival news footage, and (3) Hollywood film footage. More specifically, this study examined the differences of perceived credibility by college students from three video genres concentrating on the same historical event, the launch of Apollo 13.

Educators, education administrators, parents, and guardians are concerned with the use of Internet streaming video, both inside and outside the classroom. Since clearly defined sources and informed regulation of Internet information including streaming video are absent, students need to rely on their credibility evaluations of information (e.g., YouTube, Netflix, and Facebook) (Metzger, et al., 2003). The concerns of educators, administrators, parents and guardians were addressed by surveying college students about their perceived credibility of historical videos.

This study used a mixed method explanatory sequential design where the quantitative phase informs the qualitative phase (Creswell, 2009). Moreover, this design was framed in a theory using Fogg's Prominence-Interpretation Theory.

In the quantitative phase the participants viewed three different video genres of the same historical event. After viewing in random order (reducing order effect by counterbalancing) each one of the three videos, a questionnaire asking the same set of ten questions linked to the participant's perceived credibility of the videos viewed followed.

First, in this chapter the quantitative and qualitative data sets are integrated by summarizing, comparing, and contrasting. Second, the implications are analyzed with suggestions for educators. Finally, suggestions for future research are proposed.

Conclusions

Perceived Credibility

The median credibility scores of video genres indicated that the study participants viewed the CBS News Archival footage as most credible, followed by the NASA documentary clip, and thirdly the *Apollo 13* clip. The statistical analysis indicated a significant difference in perceived credibility between the genres.

However, in order to determine where the differences occurred between genres a post-hoc test used a multiple comparison formula. The multiple comparison revealed differences in genre credibility between CBS News and *Apollo 13* and NASA and *Apollo 13*. On the other hand, the credibility difference between CBS News and the NASA documentary footage was not significant.

The focus group participants appeared to express similar results. More than half of the Focus Group One participants viewed the CBS News footage as the most credible. In contrast, Focus Group Two saw the NASA documentary footage as most credible. None of the participants in either group considered *Apollo 13* the most credible. This finding corresponds with the statistical data, indicating there were significant differences in perceived credibility between *Apollo 13* and NASA and *Apollo 13* and CBS. Furthermore, six focus group participants had difficulty deciding between CBS and NASA.

Both focus groups agreed on the main reason a video is viewed as credible, expressing it as *reporting the facts with minimal edits*. Secondarily, the focus group participants found a video more credible when it had *less music, drama, and emotion*.

Perceived Interpretation, Prominent Credibility

One assumption that Prominence-Interpretation Theory (PIT) espouses is a person makes a judgment or interpretation about something. A second assumption is a person notices something (prominence). A credibility evaluation requires that one or the other or both must occur. According to PIT, the most credible information is information perceived to have both high rankings of interpretation and prominence. The questionnaire used in this study included five interpretation credibility questions and five prominent credibility questions.

The study participants' interpretation and prominence credibility scores were tested for significant differences employing the Friedman Test. Both sets of five questions yielded statistically significant outcomes. Since the interpretation and prominent credibility scores were statistically significant, a post-hoc test using a multiple comparison equation was used to determine where the differences occurred.

Unlike the total credibility scores that revealed significance between NASA and *Apollo 13* and CBS and *Apollo 13* but not between NASA and CBS, all three interpretation credibility scores were statistically significant, including between NASA and CBS. This suggests that there are differences in perceived interpretation credibility between all three genres.

The post-hoc test of prominent credibility scores turned out identical to the total credibility scores with NASA and *Apollo 13* and CBS and *Apollo 13* significant and NASA and CBS not significant. This study used Fogg's prominent credibility factors: engaged, likeability, background knowledge, learning style appeal, and motivation.

It appears there can be prominence without interpretation and interpretation without prominence, possibly due to the halo effect. For example, a viewer can note a video's prominent narrative without judging. Or, the viewer can judge the narrative without being engaged by the narrative's lack of prominence. This study asked questions about both prominence and interpretation in line with Fogg's theory of credibility in order to gather more robust data.

Moreover, by asking the participants to answer questions about both prominence and interpretation, it contributed to reducing the "halo effect" ("if one virtue is evident, another virtue may be assumed, rightly or wrongly") (Fogg, 2003, p. 124). In other words, if a story's narrative is highly engaging (prominent), it may be interpreted to also be credible due to the halo effect.

Perceived Engagement Credibility

Question 6 of this study's questionnaire asked: *How engaged were you in the viewing.* It would be expected that the viewing of the *Apollo 13* clip would be the most engaging due to multimodality and prominence. As it turned out, the participants found *Apollo 13* the most engaging of the three genres.

The Friedman Test helped to determine if there were significant differences in engagement credibility scores among participants. The results were significant, $p < .001$. As done previously, when there was significance, a post-hoc formula was used to find out where the differences occurred. The differences between CBS News and *Apollo 13* and NASA and *Apollo 13* were significant. On the other hand, the difference between CBS News and NASA was not significant.

Focus group question 4 also asked about engagement: *Which video did you find most engaging and why?* The focus group participants aligned with the statistical data that found that *Apollo 13* was the most engaging of the three videos. Both groups agreed that *Apollo 13* was the most engaging with 6 of 11 from Focus Group One and 4 of 5 in Focus Group Two choosing *Apollo 13* as most engaging. Both groups, however, were not unanimous on viewing *Apollo 13* as most engaging. One participant saw NASA as the most engaging. Another participant saw CBS News as the most engaging. There was one participant from each group who was torn between *Apollo 13* and NASA or CBS News. This seems to agree with the statistical data; the difference between CBS News and NASA was not significant.

Credibility and Hours Per Week Watching Streaming Video

In order to answer Research Question 2, *Is there a significant relationship between reported time spent watching Internet streaming video and each participant's perceived credibility of information received?*, a non-parametric correlation test was run using Spearman's rho. The results were statistically significant. However, because the effect size was small, the results were not practically significant.

Focus Group Question 5 revisited the question by asking: *Do you think your ability to evaluate video credibility has improved by spending more time watching Internet streaming video? Why? or Why not?* The focus group participants were divided in their responses with 56% of the responses mentioning the sub-theme *no, leads to confused thinking* and 44% responding with sub-theme *yes, practice makes perfect.*

Use of Social and Digital Media

Question 6 on the questionnaire read: *I use the following (please check)*. There were 12 digital/social media to choose from and included Internet, YouTube, Netflix, Hulu, Amazon Prime, Online Video Games, Email, Texting, Facebook, Instagram, Twitter, and Linkedin. This was followed by an open-ended question that read: *Other Digital Media Used (List)*.

All the participants checked that they used the Internet, YouTube, Email, and Texting (100%). The social media site Facebook was checked by 87% of the participants and the streaming movie site Netflix was checked by 86% of the participants.

Younger Generation, Older Generation Comparisons,

The *Kids and Credibility* study (Flanagin & Metzger, 2010) surveyed 2,747 children between the ages of 11 and 18 in 2009. The data-gathering phase of this study was conducted in 2014. Therefore, the kids from the 2009 study were 16 – 23 in 2014. Eighty-nine participants (71%) in this study were 17 – 23. Consequently, the researcher compared those who grew up immersed in digital media with those who came to embrace digital media later in life.

Ninety-six percent of the digital generation participants 17 - 23 used five or more of the 12 digital media that could be checked. In comparison, 56% of the older participants 29 – 49 used five or more of the digital media. The difference between generations became more apparent after reviewing the responses to the open-ended question: *other digital media used*. Thirty-six percent of the younger generation reported other digital media used and 17% of the older generation listed additional digital media used. That is more than a 50% difference between generations.

It is interesting to compare the newer digital/social media usage between the generations. Instagram, Twitter, and the playing of Online Video Games have the most pronounced differences. The percentages respectively younger generation – older generation are Instagram 71% - 22%, Twitter 62% - 11%, and Online Games 26% - 5%.

Based on the generational differences highlighted by the use of digital media generated by the questionnaire, the decision was reached to further explore the differences and similarities qualitatively by having Focus Group One be made up of younger, digital generation participants (mean age = 18.5) and Focus Group Two composed of older generation participants (mean age = 36.5).

The greatest differences between the two generations with participants in this study were revealed by the responses to focus group questions two, three, and six. Question 2 asked about the importance of evaluating a video's credibility. The younger generation, the more digitally immersed generation, considered it important *to avert manipulation* (38%) and *to learn what's factual and what's not* (35%). The older generation focus group prioritized credibility evaluation being important *in order to be aware of bias* (35%) and *to avoid misconceptions and wrong conclusions* (33%).

Question 3 asked which video was most credible. The younger generation commented on CBS News as being most credible. Contrarily, the older generation remarked that the NASA clip was most credible. Question 6 asked if sound quality, music, and age influenced credibility. The younger generation rated sub-theme *video age mistaken/misleading* credibility the most (48%). On the other hand, the older generation considered sub-theme *video time period puts in context* as most influential.

The focus group participants answered similarly on questions one, four, and five.

Question 1 asked for a definition of credibility. Both groups placed *trusted source/expert* as primary when defining credibility. Focus Groups One and Two agreed on the second significant factor in defining credibility: *straight information.*

Question 4 asked the participants which video they considered most engaging. Both groups concurred on *Apollo 13* as most engaging. Question 5 asked focus group participants if they noticed their ability to evaluate streaming video credibility improve as they watched more streaming video. The two groups were divided, combining to answer 56% *no, leads to confused thinking* and 44% *yes, practice makes perfect.*

Implications

Perceived Credibility

Hattie's 2012 meta-analysis of most effective ways of improving education found that teacher credibility ranked fourth out of 150. Educators may want to consider this study's finding when using video in the classroom as a teaching tool. For example, showing archival footage with minimal edits, music, drama, and emotion may not only have the students seeing the video's information as more credible but also furthering the teacher's credibility as well.

Moreover, teachers and parents may want to temper the amount of Hollywood narrative films and film clips that have extensive edits, film scores, and dramatic acting when historical events, people, and cultures are presented in a learning environment in order to achieve an enhanced perceived credibility by the students. When it comes to historical films and videos, credibility evaluations become critical. For instance, the results of one study by Butler and his colleagues, suggested, "… teachers should use

popular history films [videos] with caution and should warn students about major inaccuracies in the films" (Butler, 2009, p. 1116).

Perceived Interpretation and Prominent Credibility

Educators need to be cognizant of both interpretation and prominent credibility when presenting film and video content in a learning environment. The Butler research team published a research article titled *Using Popular Films to Enhance Classroom Learning: The Good, the Bad, and the Interesting*. They tested 54 Washington University psychology students on recall of historical information with text and historical film clips concentrating on the same events. (Butler, et al., 2009). The study disclosed that students often would recall incorrect information from a film even when it contradicted the facts provided in the text.

The historical film clips used in the Butler study were engaging and likeable, which resonates with prominent credibility. The historically accurate text aligns more with interpretation credibility. Despite receiving warnings about the historical inaccuracies in the film clips, students still answered questions incorrectly on a test that were accurately presented in the text.

Put succinctly, cognitive (related to interpretation credibility) and affective (related to prominent credibility) development combine to increase retention (Greenberg, 2010). Unmistakably, educators must be aware of and differentiate between prominent and interpretation credibility. Film and video are multimodal content affecting multiple senses and impacting affective and cognitive domains leading to retention and knowledge transfer. When the information is inaccurate yet engaging, recall can be inaccurate as well (Greenberg, 2010).

When the focus group participants were asked about credibility, they most often mentioned that a video and other sources must be trustworthy and unbiased to be credible – interpretation credibility factors. Focus Group Two was asked: *Do you think evaluating the credibility of videos is important? Why or Why not?* This group was made up of all graduate students in the sciences who thought it was most important to be aware of bias.

Both focus groups defined credibility using interpretation credibility factors and left out prominent credibility factors such as engagement. This study broadened the definition of credibility to include both interpretation and prominence. The next section will address perceived engagement credibility.

Perceived Engagement Credibility

"Engagement" has been become the latest buzzword in education (Gibbs, 2014). Teachers often provide anecdotal evidence on video's capacity to engage students. In Chapters 1 and 2 of this dissertation the word *engagement* was used more than twenty times. Noticeably, educators highly tout student engagement. Student engagement occurs when "students make a psychological investment in learning. They try hard to learn what school offers. They take pride not simply in earning the formal indicators of success (grades), but in understanding the material and incorporating or internalizing it in their lives" (Newmann, 1992, p. 2-3).

According to engagement researchers Nisbett & Ross (1980), vivid information tends to "attract and hold" the learner's attention (p. 45). This leads to greater engagement and the potential for increased credibility. Moreover, it stimulates the imagination by being "emotionally interesting," "imagery invoking," and "proximate" (Nisbett & Ross, 1980, p. 45). Further, memory storage of vivid information (e.g., multi-

modal videos) tends to be more easily remembered than "pallid" (i.e., text only) information (Nisbett & Ross, p. 45).

This study has contributed to the research on student engagement and the use of film and video as pedagogical tools in the classroom. Specifically, this study's participants saw the *Apollo 13* film clip as most engaging to the degree that was statistically significant. Teachers need to be acutely aware that film and video can be highly engaging. Thus, passive viewing can lead to misconceptions, misinformation, and incorrect conclusions. As Butler and his colleagues discovered, "When the information in the film contradicted the text, subjects often (falsely) recalled misinformation from the film. The specific warning substantially reduced this misinformation effect" (Butler, et al., 2009, p 1161).

When the focus groups were asked, *do you think evaluating the credibility of videos is important? Why or Why not?*, they responded by emphasizing the importance of avoiding misconceptions and wrong conclusions.

Credibility Evaluations Improving with More Time Watching Streaming Video

Although there was a significant correlation between time spent watching streaming video and credibility scores in this study, the small effect size of .20 indicated that the practical significance needed to be questioned. Certainly, any decision on teaching streaming video credibility evaluation by only viewing hours and hours of streaming video content ought to be tempered by further research. In the meantime, teachers, parents, and school administrators need to err on the side of caution by acknowledging that the often-overwhelming Internet information explosion can challenge even the most experienced streaming video viewer in evaluating content for credibility.

The Flanagin and Metzger *Kids and Credibility* study (2010) concluded "that although overall experience may be a good predictor of credibility concern, it may also lull youth and even parents into believing they are better at discerning the credibility of information online than they really actually are" (Flanagin & Metzger, 2010, p. 109). With both the quantitative and qualitative data not being conclusive, credibility evaluation teaching needs to be ongoing yet directed to students with "varying experience and skill levels in order to remain relevant" (Flanagin & Metzger, 2010, p. 109).

Use of Social and Digital Media by Generation

This study found both similarities and differences in the use of digital technologies by the younger generation and older generation. Specifically, they both similarly utilized 67% or more of six of the twelve digital media they were asked to report on. Internet, email, and texting were reported at 100% by both generations. Sixty-seven percent or more use was reported by both generations of Facebook, YouTube, and Netflix.

To be sure, there were differences. There was a more than a 50% difference in responses to the question of other digital media used. Furthermore, the two focus groups differed on why it was important to evaluate credibility, which video was most credible, and how sound quality, music, and video age influenced credibility. On the other hand, the two focus groups agreed on the definition of credibility, which video was most engaging, and being split on the improvement of credibility evaluation by watching more streaming video.

Teachers, parents, and school administrators need to consider the digital capabilities of their children and students. The more adaptable and digitally immersed

younger generation will respond to teaching methods that acknowledge, use, and challenge their technology skills differently than the older generation.

Further, teachers must be aware of a student's age and background knowledge. For example, the focus groups differed on which video they found most credible. The younger generation viewed CBS News as most credible and the older generation viewed NASA as most credible.

The Museum of Broadcast Communication reported that "the coverage of the space shuttle rapidly diminished, and live coverage of missions had ended long before the 25th shuttle mission on 28 January 1986" (http://www.museum.tv/eotv/spaceprogram.htm). The older generation communally watched space shuttle launches and NASA missions on network television. They were born before 1986. It follows that they considered the official NASA documentary on Apollo 13 the most credible.

The younger, net generation was born after 1986, a time when the space missions and NASA were less newsworthy. Accordingly, they did not see space flight as a novelty. Ironically, they found the network CBS News footage coverage of the launch of Apollo 13 more credible. Fifty-three percent of the older generation in this study reported watching Apollo 13 related video (e.g., the film *Apollo 13*, archival footage, and/or documentaries) 1 or 0 hours. In contrast, 35% of the younger generation watched 1 or 0 hours of Apollo 13 related video.

Suggestions for Future Research

Undoubtedly, the research on the use of film and video as teaching methods has been limited. The anecdotal evidence supporting the use of film and video is abundant.

Nonetheless, educators need to go beyond daily observations and experience and delve into the psychological and neurological workings of streaming video in order to uncover how they can be more effective as learning tools.

The current study requires further investigation in order to establish greater generalizability. Other researchers are encouraged to repeat this mixed method sequential design. The questionnaire and video clips are available for the asking. This researcher is available to share and guide others who want to enrich the body of knowledge on perceived credibility as applied to film and video.

Middle school and high school teachers could repeat this mixed method design or do either the quantitative or qualitative part of the study. The repeated measures design requires only 28 participants in order to be considered statistically powerful. Most public school classrooms have 30 or more students. An American history teacher with four or five sections could gather the data on perceived credibility of an historical event using different video genres in one day. The research on perceived credibility needs a wider age range of participants in order see the differences in credibility evaluations by age.

Future researchers may want to use other historical events using clips from documentaries, news, and Hollywood films. The choices are vast. But a few possible events where all three genres are available include: the Japanese bombing of Pearl Harbor, the dropping of the atomic bomb on Hiroshima, the civil rights march on Selma, Alabama, the anti-war movement of the 1960s, the Watergate break in, and 9/11.

A future researcher could duplicate this study using the whole NASA documentary, CBS news program, and Hollywood film. This would require hours of viewing rather than the 12 minutes it took to view the clips in this study. Additionally,

the completion of the questionnaire could not be done at the same time, which could have both positive and negative consequences.

Although the finding of research question two was statistically significant, it was not practically significant. Researchers need to ask this questions again: Is there a significant relationship between reported time spent watching Internet streaming video and each participant's perceived credibility of information received across three streaming video genres? If other researchers have different results, greater significance or no significance, then more clarity and possible generalizability could be established. In the meantime, the significant results generated by this study need to be suspect.

Another genre considered for this study was the videotaped historical lecture about the launch of Apollo 13. Because of time constraints and production budget limitations the historical lecture genre video was not used. This is a rich area for future research. With the increased use of the flipped classroom and the routine taping of college lectures, video researchers may establish the perceived credibility of video taped lectures as having greater significance than the news footage genre.

An obvious research design for educators is the pre-post test using genre video clips and whole videos of genres. For example, students could be tested on their knowledge of the launch of Apollo 13. Then view the video genres: NASA documentary, CBS News footage, *Apollo 13* film footage, and a lecture on the launch of Apollo 13. This would be followed by the same test – posttest. The results may indicate which genre generates greater learning from pre to post test.

The six qualitative research questions that emerged from the quantitative data are all research questions, individually and collectively, worthy of a study. Focus Group

Question 3, for example, *which video did you interpret as being most credible? Why?*
This could be the primary question for a focus group(s) discussion. Moreover, the
phenomenological use of interviews could be employed instead of a focus group or as a
follow up to a focus group.

The burgeoning field of neuroscience could investigate the perceived credibility
of video genres. Magnetic resonance imaging (MRI) could produce detailed images of
the brain while viewing each genre. Greater brain activity could suggest which genre has
the most impact on perceived credibility.

Finally, Paul Zak, Ph.D., pioneer in the emerging field of neuroeconmics and a
member of the Neurology Department at Loma Linda University Medical Center, shared
his research findings on trust at a 2011 Ted Talk. Trust was one of the perceived
interpretation credibility factors used in this study. His research concluded that the
molecule oxytocin contributes to the perception of trustworthiness. In 2012, he published
a book *The Moral Molecule* sharing his research. Future medical research on video genre
credibility could take blood samples from participants before and after watching different
video genres and compare the oxytocin quantities.

Finally, this researcher was surprised by the college students' astute perceived
credibility of video genres. Overall, the participants did not consider the Hollywood clip
of *Apollo 13* most credible, 1.36%, 17 of 125. The biased belief before the research
began was that prominent credibility would be most influential because of the drama,
music, editing, acting, story value, and Hollywood production superiority. On the
contrary, combining both interpretation and prominent credibility questions in the study's
survey resulted in the majority of the 125 participants choosing the *trusted source/expert*

and *straight information/factual* genres as most credible, CBS News archival footage

followed by the NASA documentary clip.

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Appendices

Appendix A   Participant Number: _____

Information Sheet

Purpose: This study investigates the perceived credibility by college students while watching different video genres of the same historical event in order to learn more about which genres are viewed as most credible, moderately credible, and least credible.

Procedures: If you choose to participate in the research, you will be asked to watch three video clips. After each video clip you will complete a short questionnaire. Each questionnaire has the same questions. Your name will not be used in the research and all questionnaires will be stored in a locked file cabinet in the researcher's office. Participation will take approximately 20 minutes.

A few of you will be asked to participate in a focus group and will be contacted by text message in a couple of weeks in order to provide the date, time, and location of the focus group. Focus group participants will be given a $5.00 gift card from Starbucks for their attendance and participation. The focus group meetings will be tape recorded and transcribed without using name identifiers. The tapes and transcripts will be stored in a locked file cabinet in the researcher's office.

Discomforts and Risks: There are no known risks.

Statement of Confidentiality: The researchers and the University of Nevada will treat your identity with professional standards of confidentiality and protect it to the extent allowed by law. You will not be personally identified in any reports or publications that may result from this study. The researchers, the Department of Health and Human Service (HHS) and the University of Nevada, Reno Social Behavioral Institutional Review Board may look at your study records.

Right to ask questions and contact information: You may ask questions of the researcher at any time by emailing Greg Nielsen at greg.nielsen@charter.net. You may also call Greg at 775-843-5566. There is an office that provides oversight called the Office of Human Research Protection. You may call them if you have any concerns on the conduct of the study at 775-327-02367.

Voluntary participation: Your participation in this study is completely voluntary. You may discontinue, at any time, without penalty.

Thank you for your participation in this study!

_____ Yes, I wish to continue with the study.

_____ No, I do not want to participate.

PLEASE PRINT LEGIBILY (only if you checked yes)

Phone number with texting capability: _____

Focus Group Best Time Availability (Please Check):

Monday: AM ____ PM ____ Tuesday: AM ____ PM ____ Wednesday: AM ____ PM ____

Thursday: AM ____ PM ____ Saturday: AM ____ PM ____ Sunday: AM ____ PM ____

Appendix B

Questionnaire Number: _____   **Group:** _____

Questionnaire:

1: What is your major: _____

Directions: Please answer the questions below as accurately as possible by writing the number in the space provided.

2: Your Age: _____

3: Estimate how many **hours per week** you watch streaming video over the Internet. Include all activities such as Netflix, YouTube, FaceBook, Music Videos, Cable Channels, National Television, Local Television, etc.

Hours per week: _____

4: Estimate the number of hours you have viewed video on Apollo 13 including: the movie *Apollo 13* and/or documentary footage of Apollo 13.

Number of hours: _____

Directions: Please check:

5: Gender – Male: _____ Female: _____

Directions: Please check all that apply:

6: I use the following (please check):

Internet: _____   Email: _____ Texting: _____

YouTube: _____   Netflix: _____ Hulu: _____ Amazon Prime: _____

Online Video Games: _____ Facebook: _____ Instagram: _____

Twitter:_____ Linkedin: _____

Other Digital Media Used (**List**):

_____

Video Number: _____

PLEASE CIRCLE ONE AND ONLY ONE RESPONSE TO EACH ITEM

Circle Only One Response

1: How accurate did you find the information?

        1   2   3   4

Not at all accurate   Very accurate.

2: How unbiased was the information?

        1   2   3   4

Not at all unbiased   Very unbiased.

3: How trustworthy was the information?

        1   2   3   4

Not at all trustworthy   Very trustworthy.

4: How fair was the information?

        1   2   3   4

Not at all fair   Very fair.

5: How comprehensive was the information?

        1   2   3   4

Not at all comprehensive   Very comprehensive.

6: How engaged were you in the viewing?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all engaged   Very engaged

7: How much did you like the video's topic?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all liked   Very much liked.

8: What is your background knowledge/experience with the video's content?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all knowledgeable   Very knowledgeable.

9: How much did the video appeal to your learning style?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all appeal   Very much appeal

10: After watching the video, how motivated were you to participate in this study?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all motivated   Very motivated

Video Number: _____

PLEASE CIRCLE ONE AND ONLY ONE RESPONSE TO EACH ITEM

Circle Only One Response

1: How accurate did you find the information?

<div align="center">1   2   3   4</div>

Not at all accurate   Very accurate.

2: How unbiased was the information?

<div align="center">1   2   3   4</div>

Not at all unbiased   Very unbiased.

3: How trustworthy was the information?

<div align="center">1   2   3   4</div>

Not at all trustworthy   Very trustworthy.

4: How fair was the information?

<div align="center">1   2   3   4</div>

Not at all fair   Very fair.

5: How comprehensive was the information?

<div align="center">1   2   3   4</div>

Not at all comprehensive   Very comprehensive.

6: How engaged were you in the viewing?

                           1   2   3   4

Not at all engaged   Very engaged

7: How much did you like the video's topic?

                           1   2   3   4

Not at all liked   Very much liked.

8: What is your background knowledge/experience with the video's content?

                           1   2   3   4

Not at all knowledgeable   Very knowledgeable.

9: How much did the video appeal to your learning style?

                           1   2   3   4

Not at all appeal   Very much appeal

10: After watching the video, how motivated were you to participate in this study?

                           1   2   3   4

Not at all motivated   Very motivated

Video Number: _____

PLEASE CIRCLE ONE AND ONLY ONE RESPONSE TO EACH ITEM

<u>**Circle Only One Response**</u>

1: How accurate did you find the information?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all accurate   Very accurate.

2: How unbiased was the information?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all unbiased   Very unbiased.

3: How trustworthy was the information?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all trustworthy   Very trustworthy.

4: How fair was the information?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all fair   Very fair.

5: How comprehensive was the information?

$$1 \quad 2 \quad 3 \quad 4$$

Not at all comprehensive   Very comprehensive.

6: How engaged were you in the viewing?

1   2   3   4

Not at all engaged   Very engaged

7: How much did you like the video's topic?

1   2   3   4

Not at all liked   Very much liked.

8: What is your background knowledge/experience with the video's content?

1   2   3   4

Not at all knowledgeable   Very knowledgeable.

9: How much did the video appeal to your learning style?

1   2   3   4

Not at all appeal   Very much appeal

10: After watching the video, how motivated were you to participate in this study?

1   2   3   4

Not at all motivated   Very motivated

Comments, thoughts, suggestions, etc.

Appendix C

Possible Pre-viewing Activities:

- Introduce the film to students
- Explain the purpose for viewing the film
- Relate the film to students' prior knowledge, everyday lives, and other content areas
- Clarify any cinematic terminology
- Discuss what is required during the viewing of the film
- Discuss assignments that will follow the viewing of the film
- Discuss the background of the film

Possible Viewing Activities:

- Have students take notes
- Have students complete a guided activity
- Have students answer questions created by the teacher
- That film can be shown in its entirely or in segments
- The lights can be off or on.

Possible Post-viewing Activities:

- Have a class discussion
- Have a class debate
- Offer some kind of written assessment
- Assign individual and group projects
- Have students evaluate the film

(Russell, 2006)

Appendix D

Benefits of Digital Learning in the Flipped Classroom:

- Learning can continue outside the classroom.
- Classroom experiences are more engaging.
- Learning adapts to the needs of the learners.
- Learners are turned into creators.
- Students are connected with experts.
- Learning is personalized.

Flipped Classroom Checklist:

- Engage tech-savvy teachers as evangelists, and encourage them to take an active role in professional development.
- After the flipped classroom has been implemented, allow students to set the pace of learning.
- Create a repository or online portal for digital assets than can be used districtwide.
- Ensure that standard digital assets are used to teach classes, along with common assessments.

Vodcast Guidelines:

- Keep videos short and concise.
- A video should be roughly half the length of a classroom lecture; ideally no more than 20 minutes in length.
- Capture lectures in conversation format, with one speaker as the expert, and the other a "novice" posing questions.

Source: "The Flipped Classroom: Empowering Students to Take Charge of Their Learning" (Cisco, 2012)

Appendix E

Focus Group Document Portraits

Theme 1: Credibility Defined

Focus Group 1
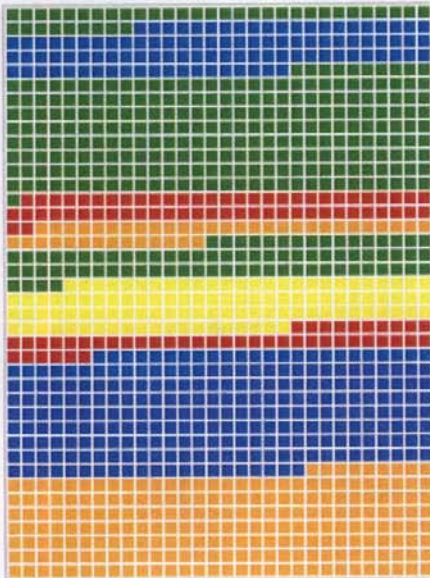
Focus Group 2
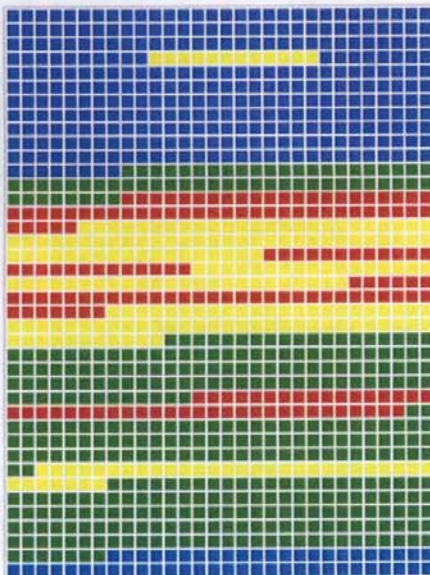
Theme 2: Importance Evaluating Video Credibility
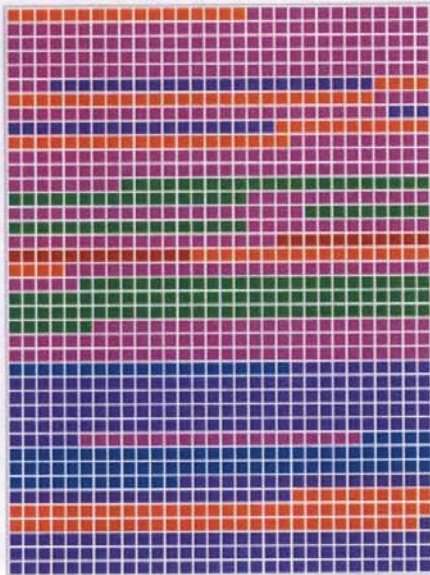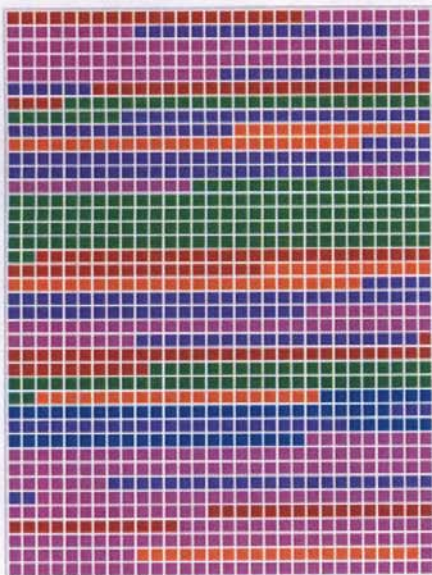
Focus Group 1
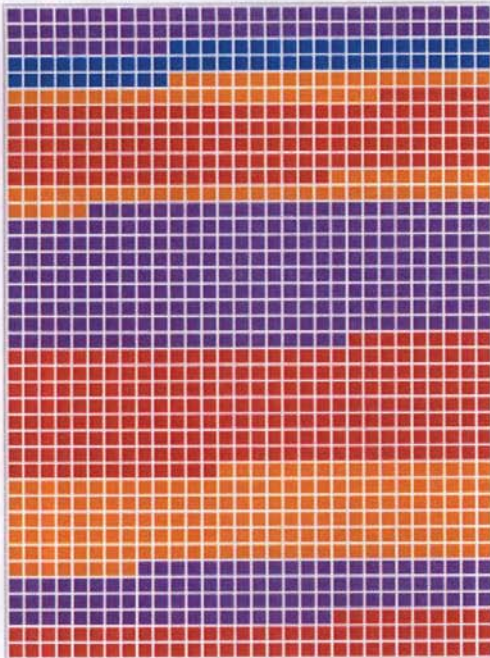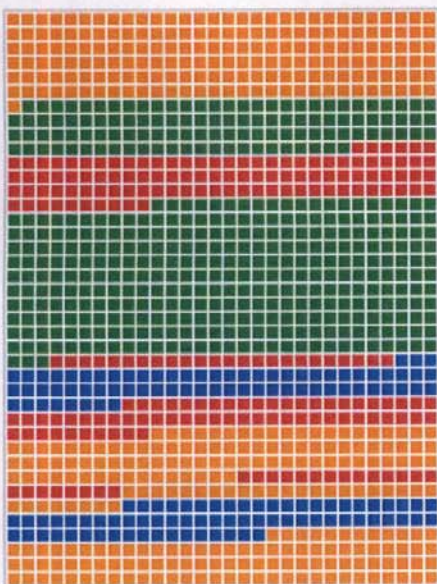
Focus Group 2

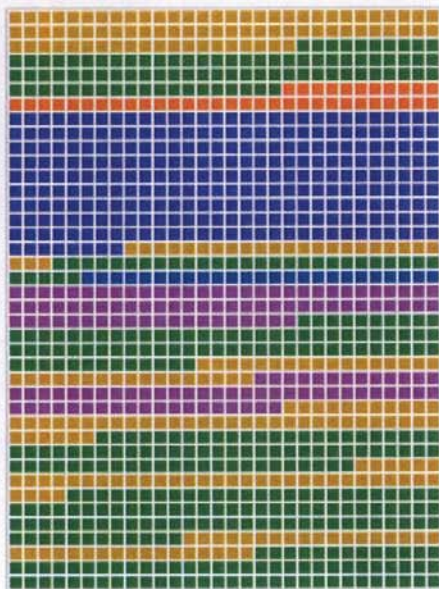Theme 3: Video Most Credible and Why

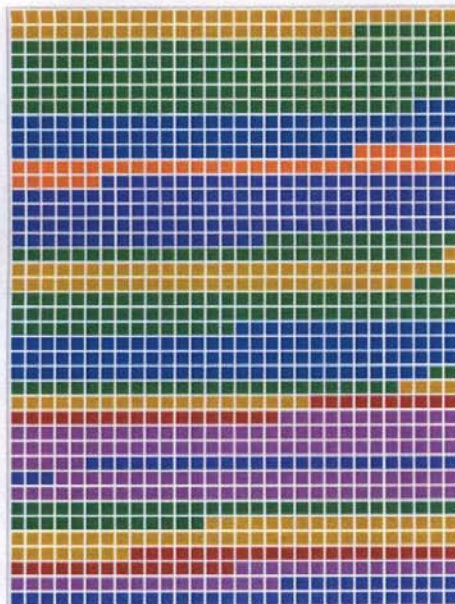Focus Group 1

Focus Group 2

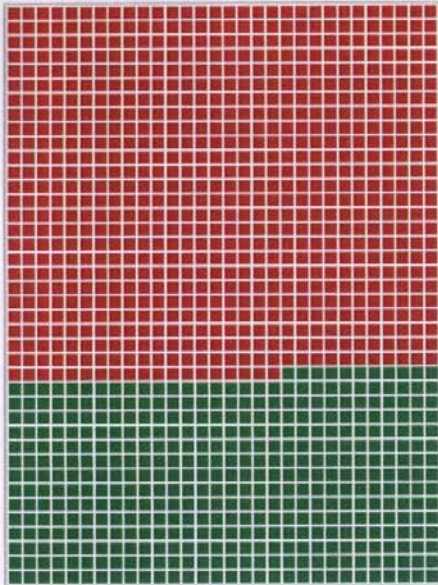Theme 4: Video Most Engaging and Why
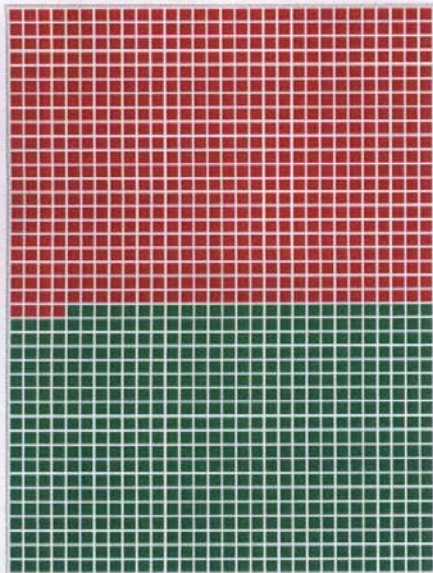
Focus Group 1

Focus Group 2

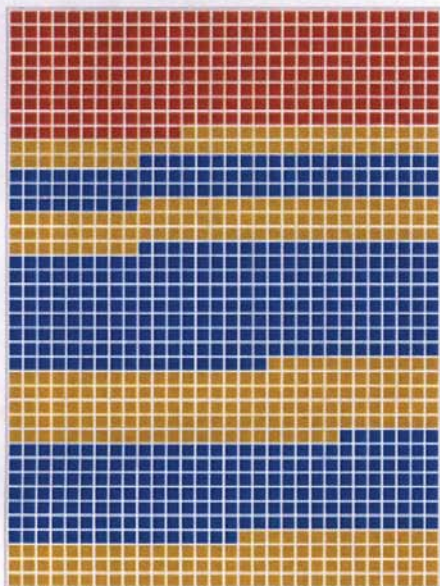Theme 5: More Time Evaluating Video Credibility, Get Better At It

Focus Group 1

Focus Group 2

Theme 6: Video Sound Quality, Music, Age Influence Credibility

Focus Group 1

Focus Group 2