TEACHER-PERCEIVED BENEFITS OF STUDENT-CREATED DIGITAL MEDIA PROJECTS ON ENGAGEMENT AND HIGHER ORDER THINKING SKILLS

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Gregory E. Rains, May 10th, 2018
Abstract

The primary purpose of this qualitative study was to determine if allowing students to show their understanding of classroom content through the creation of digital media projects would encourage higher order thinking skills and increase student engagement. Participants included teachers who chose to respond to a survey as well as a group of teachers who agreed to further discuss these techniques with the researcher through interviews and a focus group. The researcher examined qualitative data for the study, and the findings indicated teachers believe assigning digital media projects does indeed result in higher levels of student engagement, and that well-crafted assignments can foster higher order thinking skills.

Keywords: Filmmaking, digital storytelling, higher order thinking skills, student engagement, situated-learning
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First, I am thankful to God the Father, Christ the Son and the Holy Spirit for their grand vision to save humanity. I am also thankful for God’s guidance in my own life and the opportunities that this short life provides. I sincerely desire for God to shape my life just as a potter shapes the vessels of clay. I believe the words of the prophet Jeremiah who said it is not in man that walketh to direct his own footsteps.

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Finally, a big thank you to the teachers who so freely and generously gave of their time to respond to my survey, answer my interview questions and serve as members of the focus group.
Dedication

This dissertation is dedicated to my mother – the late Della Mozella Haynes Rains – who only received an eighth-grade education. She was one of eleven children, and she grew up in poverty. The household did not have running water and she would have to go to a spring a couple of miles away every day to get water for cooking, cleaning, and drinking. At the time she was going to school in Virginia, the school system did not provide free textbooks. Parents were expected to pay for them. More often than not, her parents could not afford her textbooks. She recognized all the roadblocks her lack of education put in her path. She did not want that for me, her son. She always encouraged me to take advantage of the opportunities to learn and do my best. I know she would be proud of this accomplishment.
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CHAPTER ONE

Introduction and background

While there always has been and always will be fads in education touted as the latest and greatest practice, this paper contends the introduction of well-planned, student-centered digital media creation projects into the classroom encourages higher order thinking skills and increases student engagement. These projects can range from the complex task of creating a short film to the simpler task of putting together a slide presentation. Speaking of the former, this researcher has specifically witnessed that the introduction of the three main disciplines of filmmaking – writing, shooting, and editing – almost invisibly engages the student and seemingly leads them right up the pyramid of Bloom’s taxonomy (1956). Additionally, the researcher observed in his own experience that the introduction of student-centered digital media projects seemed to generate enthusiasm and excitement in the learning. While these prior experiences are primarily anecdotal, they seem to indicate digital media creation – i.e., filmmaking, digital storytelling, vlogging, Animoto, augmented reality, and slide creation – can have a positive impact on student learning.

Research problem

The researcher sought answers to two aspects of digital media creation in the classroom. First, to what extent does integrating digital media creation into the curriculum encourage higher order thinking skills? Second, to what extent does integrating digital media creation into the curriculum increase student engagement? The researcher contends that students in any class – e.g., math, science, history, English, related arts – can use digital media creation techniques to craft an end-product that demonstrates their learning to the world.
Purpose of the study

The purpose of this study is to determine if student-centered media creation projects encourage higher order thinking skill as well as higher levels of student engagement. Of course, it is one thing to have a hunch that digital media creation is a great pedagogical technique and quite another thing to have proof. This paper details the results of a study to examine that hunch in a controlled scientific way. It is the purpose of this qualitative study to investigate digital media creation as a pedagogical technique that provides the benefits above.

Research questions

Mills, Comber, and Kelly (2013) make a distinction between literacy practices that only happen in the head of the student as opposed to externalizing the learning by using digital media creation. Their study specifically examined filmmaking. The concept is that digital media creation turns students from passive observers into active participants. This researcher contends educators can tailor digital media creation projects into a fun, student-centered, content-rich, situated-learning assignment which engages students with the lesson for long periods of time.

This study will focus on the following research questions:

1. Does the introduction of digital media creation encourage higher order thinking skills?
2. Does the introduction of digital media creation projects increase student engagement?

More specifically, the research will survey teachers to determine the extent to which they have used digital media creation projects in their classrooms. The research will try to determine if the digital media creation projects encouraged higher order thinking skills and increased student engagement.
Rationale for the study

While there is research out there that looks in isolation at each one of the three topics of this paper – digital media creation, higher order thinking and student engagement – the researcher is not aware of any studies that combine all three of these ideas into one study. Such a study is needed because a teacher’s perception can become skewed when he or she introduces something into the classroom that they perceive as fun and enjoyable. Additionally, this kind of research will directly impact student learning since the students are the producers of the content.

The researcher

The researcher is currently an eighth-grade regular education English teacher in a sixth through eighth-grade middle school in southern middle Tennessee. Before the researcher’s current assignment, he served eight years in a nearby county as a special education high school teacher. He spent two of those eight years as an inclusion English teacher – one year in ninth grade and one year in tenth grade. The researcher spent the remaining six years as a work-based learning teacher and job coach serving students with disabilities along the entire spectrum from severe/profound to mild/moderate. The last assignment was serving special education students on track to receive a regular education diploma.

While working with special education students, the researcher discovered this population of students, in particular, retains their learning better when they can see a digital media product such as a PowerPoint, a screen capture or a video. Additionally, it seemed to the researcher that special education students remember the content even better when they are involved in the creation of the digital media project. Upon starting a regular education position, the researcher questioned whether all students might retain information better if they can be involved in the creation of digital media projects.
Digital media creation has always been an area of interest for the researcher as his bachelor’s degree was in Mass Communications. Before entering the education field, he served as a newspaper reporter/editor, a portrait photographer, and a cable television news anchor.

**Definition of terms**

**Film** - A term used to describe a specific technology – a thin, flexible material coated with a light-sensitive emulsion that retains an image after it is exposed to light.

**Filmmaking** - A holdover term that once referred to making a visual product on actual film that projected onto a screen. Today, it means editing digital video clips together with a computer to create a story disseminated as narrowly or broadly as the educator deems appropriate (Theodosakis, 2009).

**Digital storytelling** – This term is a short form of digital media production which allows everyday people to share aspects of their story using video, still images, music, and narration.

**Situated-learning** - A theory that knowing and doing are linked (Lave & Wenger, 1991).

**Student engagement** - The amount of time a student spends thinking about and creating an end product to show their learning (Bradford, Mowder & Bohte, 2016).

**Summary**

To summarize, this study surveyed all teachers in the school above regarding digital media creation in their classrooms. Responses were received from teachers who provide opportunities for students to show mastery of subject matter by creating a digital end product as well as from teachers who do not – for various reasons – provide those opportunities. The responses were collected, categorized and expressed into a narrative to show the impact of digital media creation. Of those teachers who responded to the survey, five teachers were interviewed further about the specific digital media projects in their classrooms. After that, the pool was narrowed to four teachers who used digital media projects on a fairly regular basis as
part of their curriculum. These four teachers participated in the focus group. All teachers who participated in the initial survey were given access to a rough draft of Chapter Four as a member check. They were encouraged to contact the researcher should they find anything that had been misinterpreted or misunderstood.
CHAPTER TWO

Broad historical literature

The purpose of this qualitative, descriptive study is to determine if allowing students to show their understanding of particular learning objectives through digital media creation projects fosters higher order thinking skills and increases student engagement. This review of literature will trace the major milestones in the development of the visual and auditory arts from antiquity to the present. Additionally, the review will examine the affinity today's young people already have with technological devices and the tools necessary for digital media creation. From there the review will continue with a discussion of higher order thinking skills and student engagement. Finally, the focus will narrow to various and seemingly divergent sources on digital media creation in an educational setting. This literature review will lead the reasonable mind to conclude that well-rounded teachers should consider assigning digital media projects.

Early historical beginnings

Creating a visual representation of an actual event is as old as time itself. For example, we can look at the drawings of early humanity in caves that depict successful campaigns to kill animals for food. Humanity has always needed to take an event from real life, process it in the mind and then transfer it to a representational medium outside the mind. The motive for this transfer seems to be a need to communicate to current and future generations. In addition to those visual representations, there are the oral traditions passed down from generation to generation through storytelling. Once again, the motivation to pass along information through oral tradition seems to be the same – getting useful information to current and future generations.

From these crude beginnings, we can trace such things as writing, painting, and theater – all precursors to digital media creation. As far as writing is concerned, the cuneiform seems to
be the earliest example historians can find (Schmandt-Besserat, 1992). It started as pictograms and evolved into a complete alphabet. About 100 years later came the development of Egyptian hieroglyphs. Both of these systems are pictographic. To put it another way, people took those drawings from the cave and placed them on a more mobile surface. Dard Hunter (1978) identifies several mediums for writing throughout history including “wood, metal, stone, ceramics, leaves, barks, cloth, papyrus and parchment.” He goes on to make the bold claim that “the progress of man through the myriad centuries may be divided into three dominant, fundamental steps” – speaking, drawing and printing (Hunter, 1978).

**The printing press as a precursor to digital media projects**

Many centuries would pass until around 1439 or 1440. It was at this time that one of the major milestones for the printed word came with the invention of the printing press by Johann Gutenberg (Eisenstein, 1980). One of the first things Gutenberg printed was the Bible in Latin. Before this invention, scribes would look at the words from an original manuscript, take a quill dipped in ink and then duplicate those letters on scrolls of paper or sheepskin or some other medium. These scribes had to painstakingly copy a manuscript one word at a time. Making a copy of another manuscript was a laborious task and took a long time. About 25 years after Gutenberg printed his Latin Bibles, Johannes Mentelin would print the first German-language Bibles (Fischer & Moger, 2016). The first mass-produced printed English language Bibles were attributed to William Tyndale in 1526 (Daniell, 2001) Tyndale’s Bibles were printed outside England and then smuggled into the country. Tyndale thought the common people of England should be able to read the Bible for themselves. It was actually against the law in England to translate the Bible into English. Tyndale’s Bible was banned, and he was tried and convicted in Belgium of being a heretic and then executed on October 6, 1536 (Daniell, 2001). Men like
Tyndale and Martin Luther started and fanned the flames of the reformation movement that swept across Europe. One of the key elements in the reformation movement was the power of putting the printed word of God into the hands of the common people. The printed word had that kind of power then and still has that kind of power today.

While it might be tempting to say in modern times that writing is going away in favor of more visual means of communication, nothing could be further from the truth. Even in video production, writing is still an essential part of the planning process. Any well-planned, professional film or video production begins with script writing. But while writing is certainly not going away, no one can deny that the medium we use to display the writing is more often than not a computer monitor, a tablet or a smartphone as opposed to a piece of paper.

**Painting as a precursor to digital media projects**

Tracing the history of painting one step beyond the scrawlings of cave dwellers, one discovers the art from the Egyptian and Mesopotamian era which included accurate depictions of various forms of wildlife in the region (Landau, n.d.) These depictions of Egyptian life give historians and Egyptologists insights into everyday life during these periods of time. There are other mileposts along the way including Greek and classical Roman painting. Once again, the art depicted in paintings and on pottery give modern man great insights into those ancient cultures. Moving past Greek and Roman paintings, the next milestone would be early Christian and Byzantine paintings as well as medieval painting. Byzantine art had one main goal – to glorify and express the mystery of the Christian religion (Roland, n.d.). Additionally, Byzantine art is “filled with a kind of spiritual symbolism – things on earth are meant to stand for the order of heaven” (Roland, n.d.).
It was during the Renaissance that painting as an art form came into its own. The most famous painter during this period was Leonardo Davinci. Some of his most famous paintings are the *Mona Lisa, the Last Supper, and Vitruvian Man*. Filmmakers today still reference the works of Leonardo Da Vinci. Another famous artist of this period is Michelangelo Buonarroti. Some of his most famous works include the *Creation of Adam* on the Sistine Chapel, *The Last Judgment* and the sculpture of *David*.

After the Renaissance period, there was the Baroque period of the 17th and 18th centuries. One of the greatest painters of this era was Rembrandt. Many of the lighting techniques pioneered by Rembrandt are still employed today in photography, videography and on movie sets. Some of Rembrandt's most famous works include *The Night Watch, The Storm on the Sea of Galilee, Self Portrait with Two Circles, Danaë* and *The Return of the Prodigal Son*.

**Stage acting as a precursor to digital media projects**

To informally trace the origins of acting, one supposes that our cave-dwelling ancestors gathered around the campfire and re-enacted the hunt. Someone would pretend to be the hunter, and someone else would be the animal, perhaps even donning the skin of the slain animal. Yann-Pierre Montelle (2009) explores the evidence for such a scenario in his book *Palaeoperformance*. Montelle visited the prehistoric caves in France and examined the cave paintings as well as the etchings and carvings in the rock wall. Additionally, he closely observed the bone flutes, scrapers and bullroarers found in the caves. A bullroarer is a piece of wood tied to a string that makes a noise as the individual using it is quickly rotates the item in a circular motion above their head. Montelle also identified large rooms in many of these caves.
that would be perfect for performance. These evidences seem to suggest that our ancestors were not dumb savages like the stereotypes would have us to believe.

Since there are no written records to prove or disprove acting took place in the aforementioned cave scenario, the seeker of truth must move forward in time to Greek civilization to obtain actual proof of the advancement of the acting craft. All acting, whether it be for theater, film or video can formally be traced back to the Greek tragedies. The first formal exhibition of tragedy occurred at Athens as a recognized part of the festival of the City Dionysia in 534 B.C. (O'Connor, 1908). Soon after that, organizers admitted the comedy into the same festival. In 449 B.C. the contest of tragic actors was organized (O'Connor, 1908). It was Aristotle who first attempted to study acting in a serious scientific way (Benedetti, 2013). Benedetti observes that Aristotle "laid the foundations for the study of theatre and performance. He also provided the first comprehensive study of human emotion and social behavior, which remained the dominant statement until the creation of individual psychology in the late nineteenth century" (2013).

Gascoigne (2011) relates in the 6th century BC a priest of Dionysus, Thespis, introduced a new element which historians see as the birth of theater. “He engages in a dialogue with the chorus. He becomes, in effect, the first actor. Actors in the west, ever since, have been proud to call themselves Thespians” (Gascoigne, 2011).

The next great milestone in acting would be the popular morality plays of the 15th and 16th centuries. Also known as liturgical dramas, the church sponsored these performances which featured a moral lesson for the playgoer. Gascoigne identifies several mileposts along the way from the 16th to 18th Centuries. One of these mileposts is solely devoted to William Shakespeare. With themes including tragedy, comedy, tragic comedies and histories, William
Shakespeare wrote 37 plays from about 1590 to 1613 (William Shakespeare, 2017). Shakespeare stands head and shoulders above all playwrights. The universal themes in his plays are just as relevant today as when he first penned them almost 500 years ago.

Acting in the distant past was usually characterized by big gestures and loud voices. In modern times, acting has taken on a more subtle approach that is embodied in the acting techniques pioneered by Russian director Konstantin Stanislavski. He taught that actors should find something in their emotional memory to bring to the emotional situation of a character. If the character in a play has lost someone close to them, the actors should try to recall their feelings when they lost someone in real life. The Stanislavski method was adopted by the Group Theatre in New York City in the 1930s. One of the founders of the group, Lee Strasberg, became a proponent of the Stanislavski system. Stella Adler studied the Stanislavski system also and even joined the Group Theatre. She developed her own school of thought on the subject of acting that differed from Strasberg. Her emphasis was on using imagination to get into the “known circumstances” of a character so that the actor can get into the skin of the character (The Method, n.d.). Reportedly, Adler said, "Drawing on the emotions I experienced — for example, when my mother died — to create a role is sick and schizophrenic. If that is acting, I don't want to do it" (The Method, n.d.).

**Photography as a precursor to digital media projects**

With the basic filmmaking precursors of writing, painting and acting in place and developing, a monumental technological leap forward occurred in 1839 when the Frenchman Louis Daguerre introduced a photographic technology that bore his name. Society dubbed these photographs “daguerreotypes” (Lessig, 2015). Because of the cost associated with producing a daguerreotype, only professionals and wealthy amateurs could afford to make these photographs
It was George Eastman who ushered in the next major milestone for photographic technology with his invention of rolls of light-sensitive film in 1888. Up to this time, the image was captured on a silver plate and protected with a layer of glass on top (Lessig, 2015). Because Eastman's invention brought down the costs associated with photography, the masses could afford to take their own pictures with relatively cheap cameras and film. The film was mailed off to Eastman who developed it and sent the pictures and negatives back to the customer.

**Filmmaking technologies as a precursor to digital media projects**

While the aforementioned photographic technologies provided proof that an image could be captured and held on a medium, during the same period inventors were working on the precursors of film projectors. In the early to mid-1830s, three inventors located in three different countries developed inventions to show moving images on drums or disks. Those inventors were "Simon von Stampfer (Stroboscope) in Austria, Joseph Plateau (Phonakistoscope) in Belgium and William Horner (zoetrope) in Britain" (Christopher, 2014). There were many other breakthroughs along the way that made it possible for inventors to create the first motion picture cameras around 1890. In 1905, Cooper Hewitt mercury lamps made it possible to shoot films indoors instead of outside (Christopher, 2014). Up until 1927, films were silent. In some instances, the movie house hired musicians to play an appropriate selection while the action took place. But there were no actors speaking lines in the silent era of films.

In the beginning, filmmakers would just put the camera in a stationary position and film the action. But filmmakers soon discovered they could film the same scene from two or three angles and splice those scenes together into one contiguous piece of film. These changes, if done correctly, are not jarring to the audience because the viewer understands it is the same
story and that they are just seeing the scene from a different angle. To maintain audience orientation, filmmakers try not to break something called the 180-degree rule (Branigan, 2013). This means that on a 360-degree axis, the camera operator stays on one side of the circle. It is usually disorienting for the viewer if the cameraman breaks the 180-degree rule. There are times when the 180-degree rule is broken on purpose to cause disorientation in the viewer. Filmmakers also discovered early on a visual language association with camera angles. If the camera is shooting up at a character from a low angle, that character seemed to be in a powerful position (Mamer, 2008). The opposite of this is the high angle. In this setup, the camera is higher than the subject and is shooting down on the subject. In this arrangement, the subject appears small and powerless (Mamer, 2008).

**Universal familiarity with digital media projects**

Just about everyone living today regardless of age has some connection to digital media creation. For the elderly, they may have a favorite television show. The middle-aged may have a preferred movie genre. And the younger generation may keep with up every episode of a particular YouTuber that they like. The filmmaking industry has etched one iconic phrase into the human psyche almost from the very beginning of motion pictures. It is a phrase that many have attributed to early film pioneer D.W. Griffith. It is also supposedly said by all serious film directors today. The phrase? “Lights, camera, action!” Just hearing those words is very exciting to many people. Students hear that phrase these days and immediately think of a film set, a director, a crew and actors transforming words on a page into a work of art called a film.

It is somewhat ironic that films are still called films because they are primarily produced with digital cameras these days and hardly ever on film anymore. According to Stephen Follows, 2002 marked the first year that top-grossing films were shot digitally (2016). He goes
on to say that 2012 marked the first year that half of all top-grossing films were shot digitally. Since that time the number of films shot digitally has gone up, and the number of films shot on actual film has gone down.

Digital filmmaking allows directors to immediately see the performance and determine if another take is needed or if they can move on to his next shot. One recent exception to the digital trend in filmmaking is the Quentin Tarantino movie “The Hateful Eight” (Dixon, 2016). In this movie, Tarantino used 70 mm film. Tarantino is certainly a maverick; however, most directors today love being able to see the immediate results of a scene.

**Digital media projects as a tool for educators**

The good news for educators is that the advent of digital video cameras, tablet computers and smartphones with video cameras built in has brought down the costs associated with making a “film” so that just about anyone can do it – even students in a classroom. The digital revolution extends beyond the camera to the computer so that the footage can be edited together fairly easily and output either to a disc or a file that is played locally on the computer or uploaded to YouTube for viewing by a wider audience. There are many non-linear video editing programs available. Some editing programs come free with the computer such as Windows Movie Maker or iMovie on the Mac. There are also free non-linear video editing programs from third-party providers like Shotcut and Hitfilm Express. Additionally, there are software packages that can be purchased such as Final Cut Pro, Adobe Premiere, and Sony Vegas, to name a few. These digital tools allow students to communicate their understanding of classroom content in a visual way as either a film or a digital story.
Theoretical lens and related theoretical literature on higher order thinking skills

Since the researcher contends digital media creation causes students to think about the subject matter being taught on a very deep level, Bloom's taxonomy provides an excellent theoretical framework. Students must use higher order thinking skills instead of just memorizing facts. The student must come up with an idea, identify key points, develop visual representations of the material, create plots and prioritize relevant information. Additionally, they must learn to manage time. If creating a slideshow or a digital story, the student must gather the visual and audio resources in a timely manner. The student must then pull all these elements together into a single, cohesive story. Slideshows and digital storytelling assignments are better suited for one individual student as opposed to a group effort.

If creating a film, students must work together in teams. Students must budget time for a cohesive shooting schedule. At the same time, they must convert the idea into a screenplay, reinterpret the screenplay into a storyboard for visualization, rework the idea during the actual filming process and finally analyze and make a finished product in the edit bay. Additionally, students have to identify which types of shots work best for certain situations in terms of lighting and the mood they are trying to convey. And besides all of that, students must work together to film each other, collaborate on the script and storyboard, be responsible for their contribution to the process, memorize lines and depend on each other to put forth their best effort. The collaborative, cooperative filmmaking process mirrors what the business world expects from students joining the ranks of the workforce.

American education pioneer John Dewey talked about critical thinking and student engagement with authentic, real-world problems in the 1930s during a time when American business just wanted schools to produce an obedient factory worker (1997). Dewey noted
critical thinking takes place when the individual is presented with a really good problem that stimulates natural curiosity and results in learning and critical thought.

Dewey noted, “Only by wrestling with the conditions of the problem first hand, seeking and finding his own way out does [the student] think (1997). Bean elaborated on this idea and concluded one of the chief duties of teachers is to design interesting problems for students to solve (2011).

One of Dewey's best quotes that seems to address the reason behind wanting to incorporate filmmaking and digital storytelling into the curriculum follows:

“If we teach today’s students as we taught yesterday’s, we rob them of tomorrow.”

While the phrase, higher order thinking skills, is a term that is much bandied about in many spheres of human knowledge, it is nevertheless hard to define. Resnick points out these definitions from various disciplines when she observes “philosophers promote critical thinking and logical reasoning skills, developmental psychologists point to metacognition, and cognitive scientists study cognitive strategies and heuristics. Educators advocate training in study skills and problem-solving (1987).”

While Resnick notes higher order thinking skills are hard to define, she submits the following criteria to determine if this kind of thinking is present or not:

• Higher order thinking is nonalgorithmic. That is, the path of action is not fully specified in advance.

• Higher order thinking tends to be complex. The total path is not "visible" (mentally speaking) from any single vantage point.

• Higher order thinking often yields multiple solutions, each with costs and benefits, rather than unique solutions.
• Higher order thinking involves nuanced judgment and interpretation.

• Higher order thinking involves the application of multiple criteria, which sometimes conflict with one another.

• Higher order thinking often involves uncertainty. Not everything that bears on the task at hand is known.

• Higher order thinking involves self-regulation of the thinking process. We do not recognize higher order thinking in an individual when someone else "calls the plays" at every step.

• Higher order thinking involves imposing meaning, finding structure in apparent disorder.

• Higher order thinking is effortful. There is considerable mental work involved in the kinds of elaborations and judgments required.

Educators can plan digital media creation assignments that hit just about every level of Bloom’s taxonomy (1956). A group of eight educators and researchers including one of Bloom’s associates – Lorin Anderson – renamed the levels in the taxonomy to the following: Knowing, Understanding, Applying, Analyzing, Evaluating and Creating (Anderson, 2005). The highest level is creating. Digital storytelling and filmmaking both require the student to create something. Digital storytelling requires the student to write a narration script, collect audio and video clips and edit everything together into a final digital file. The process of making a film – especially student-made films – very much involves creation in all three aspects of filmmaking: writing, shooting, and editing. Students must use higher order thinking skills as they generate a final product to communicate a message about the content they are learning.
Higher order thinking skills are required for the entire process of screenwriting, storyboarding, filming and editing.

Creating a digital story or a film requires higher order thinking skills. Forster noted it is important for educators to give their students opportunities to use higher order thinking skills (2004). Student-centered media creation projects require students to come up with an idea, identify key points, design visual approaches to the material, create plots, prioritize relevant information and use time wisely.

Filmmaking projects require a little more of students. To create a film, the student must interpret an idea into paper for a screenplay, reinterpret it again into a storyboard for visualization, interpret it yet again during the actual filming process and finally analyze and make final products in editing. Additionally, students have to identify which types of shots work best for certain situations in relation to mood and lighting.

Moreover, besides all of that, they must work together to film each other, collaborate on a script and storyboard, be responsible for their contribution to the process, memorize lines and trust each other to put forth their best effort at all times just like a symphony or a sports team. Gillespie makes this point as she describes her journey as an art teacher who sought out an opportunity for professional growth and stumbled upon video production and filmmaking (2005). She describes the benefits of making films in terms of teaching students the skills they need to express themselves using the visual medium of filmmaking. Alternatively, to state the case another way, filmmaking gives students opportunities to develop 21st Century skills that go beyond the practical aspects of filmmaking. In other words, there are a lot of people skills involved in making films.
There could be one or two students who might not be overly enthusiastic to abandon traditional testing and quizzes to show their understanding since those methods feel safe and comfortable. However, Coleman’s research identified filmmaking as one of six domains that get students excited about learning (2013). He goes on to talk about finding and igniting in each student a passion for learning. While the article primarily examined gifted students, this paper contends all students can benefit from assignments that tap into each young person’s passion for learning. Digital storytelling and filmmaking give students an opportunity to pursue their passions. And filmmaking, in particular, requires so many different roles and areas of responsibility that most students are going to find something about which they can get excited.

Since we live in a media-saturated society, Dando and Chadwick postulate students should cast a critical eye on both the media they consume as well as the media they produce (2014). Just Think! Executive Director Dave Yanofsky observes “media literacy is the ability . . . to understand, analyze and deconstruct media images. Its aim is to make [kids] literate about the way media work, the way it’s constructed, the way it’s delivered, and the way people access it” (Lessig, 2005).

Dando and Chadwick go on to examine the relationship between geographic theory and real places in the real world. The authors lament the fact that there seems to be less money for field trips to explore the real world. They go on to say budget restraints have replaced real field trips with virtual field trips along with web-based research and mapping. Filmmaking can be used in any class or discipline – in this case, a geography class (2014).

Lewis and Smith (1993) say these complex thinking skills include critical thinking and problem-solving. Specific problems require different levels of thinking skills depending on the prior knowledge of the individual (Newmann, 1990). In other words, solving a particular
problem for one person may not require much thought at all because the individual has solved the problem in the past. For another student without this prior knowledge, higher order thinking skills must be employed because the student has never encountered that particular problem before.

The sheer volume of information on the internet dictates that successful students must employ higher order thinking skills as they evaluate and synthesize all that information. To successfully navigate this mental minefield, students must develop great problem-solving skills to include decision making, value analysis and hypothesis testing (Bruning, Schraw, Norby, & Ronning, 2003).

Several authors have attempted to define critical thinking including Glaser (1941), Ennis (1993) and Fisher and Scriven (1997). Despite the diverse backgrounds, they all arrive at a definition of critical thinking that seems to involve reflective thinking, analysis, and metacognition as well as coming to an understanding of how the thinker came to an understanding of a particular issue.

Although targeted toward gifted education, Renzulli (1977) and Tomlinson (1996) write about the importance of providing opportunities for higher order thinking. Researchers are beginning to discover that techniques and strategies that are good for gifted students can also benefit the rest of the student population.

Students in most schools today have greater access to technology than students of yesteryear. Over the past 25 years, student access to computers has increased as well as more sophisticated uses of the computer in a learning environment. Jonassen (2000) and Siegle (2004) both relate that electronic worksheets have given way to more robust and meaningful uses of the computer, especially in gathering and presenting information. To present this
information in an interesting and cohesive manner, the learner must employ critical thinking skills to examine, repackage, and communicate information. However, Oliver and Hannafin (2000) emphasize educators must first teach critical thinking skills if they want students to use higher order thinking skills for the completion of a task.

Digital storytelling is one of the relatively new ways students can take technological tools and express themselves while publishing an authentic product to the world. But just because a piece of technology exists does not mean the technology in and of itself will engage students and cause them to really think about the assigned task. Jonassen (2000) uses the term “mindtool” when referring to technology. Liu & Bera (2005) note mindtools, also known as cognitive tools, should serve the purpose of extending and supporting the thinking process. These cognitive tools if used improperly could be compared to someone using a pipe wrench as a hammer. The role of a mindtool is to engage the student in higher order thinking.

When students use mindtools, they are assimilating newly acquired information into an existing schema. This kind of learning falls into the category of constructivist pedagogy because students construct meaning as they carry out the assignment. Land & Hannafin (2000) observe constructivist pedagogy is by definition student-centered and goal-directed and thus must be classified as an example of an authentic learning environment. Chaiklin further explains students working on these tasks have been given just enough instruction in critical thinking to begin the task are working in their zone of proximal development (2003).

Geoffrey Scheurman (1998) cites Piaget's cognitive constructivism and Vygotsky's social constructivism as two progenitors of modern constructivist pedagogy. By definition, the role of teachers who give assignments in a constructivist environment is that of facilitator or collaborator in the learning process (Scheurman, 1998).
While specifically focused on social studies instruction, Philip Molebash describes a constructivist pedagogy where students work individually on identifying subjectivity and biases of existing interpretation in the social studies curriculum. Next, the students arrive at their own conclusions. The teacher in this scenario abandons the position of lecturer and instead circulates around the room as the facilitator. Siegle (2005) maintains gifted, and high-performing students do well in such an environment. A meta-analysis by Christmann, Badgett, and Lucking (1997) indicated there is a small, but positive impact on high school biology achievement scores for those students who were given access to computer-aided instruction.

A position paper by Mason, Berson, Diem, Hicks, Lee & Dralle (2000) on preparing social studies teachers to use technology in the classroom outlined the following five guidelines:

• Extend learning beyond what could be done without technology.
• Introduce technology in context.
• Include opportunities for students to study relationships among science, technology, and society.
• Foster the development of the skill, knowledge, and participation as good citizens in a democratic society.
• Contribute to the research and evaluation of social studies and technology (p. 107).

The authors go on to conclude that ongoing and consistent teacher training in technology is a necessity. The article points out technology is changing so rapidly that in six months most hardware or software systems are obsolete. While this is certainly true, even older hardware and software systems can be used by students to communicate their message. Free movie-making software on both the PC and the Mac make it easy for students to create films as well as digital
stories. Students can combine many forms of media into a single presentation and communicate to the world.

One of the benefits of nonlinear video editing for students is that they must gather various media resources including still pictures as well as audio and video clips. Collecting and combining all the media resources into a single video file requires higher order thinking skills. The student must make editing decisions as to what material to use and how much of it to use. In the case of video clips, many subtle editing decisions can have a huge impact on the final product. Additionally, there are many free resources on the internet that the student may use to tell the story for an assignment.

According to Siegel, there are four modes of learning associated with using technology for a classroom assignment. These modes are acquiring, retrieving, constructing and presenting information (Siegel, 2004). Students use all four modes when they engage in digital media creation because they must research information, capture still and moving images as well as sound, construct meaning from the information acquired and finally create an authentic product of their learning that can be shared with the world if so desired.

While not the focus of this paper, there are other ways to incorporate technology into the classroom besides filmmaking, digital storytelling, and slideshows. Marcus (2008) relates how he used iPods to encourage his middle school students to analyze song lyrics and make connections with literature. He describes the high-interest level from his students for the project as well as the creation of a sense of community.

Higher order thinking skills are also encouraged through electronic portfolios that give students a means of reflecting on and analyzing previous work and progress. One of the benefits of allowing students to see the evolution of their thought processes is that it promotes
metacognition. Known simply as thinking about your thinking, metacognition is an essential skill associated with higher order thinking.

**Theoretical lens and related theoretical literature on student engagement**

A search for source material on student engagement will invariably lead to studies that mention student motivation. These two terms are inextricably linked because students who are engaged in an activity do not need the teacher to constantly remind them to get to work. The engaged student is naturally motivated and this stands in contrast to most classrooms across the country where students are required to jump through a prescribed number of hoops by a teacher. The students usually have little choice in their assignments.

There is no doubt that student engagement is a problem in most American schools. A recent Gallup poll indicated student motivation decreases the longer a student is in school (Busteed, 2013). The poll indicated 8 in 10 elementary school students were engaged, 6 in 10 middle school students were engaged, and 4 in 10 high school students were engaged. This is the exact opposite of what educators want in the classroom. By opening the possibilities of students demonstrating their learning through a digital media creation project on a particular subject, the students are allowed to use their creativity and imagination to show their learning. This simple act increases student engagement in the project.

Zmuda, Ullman, and Curtis observe that typical students view schooling as a series of “required experiences” (2015). The authors go on to say that students experience “sanitized assignments designed more for efficiency than for deep learning.” Furthermore, the authors establish the fact that most traditional assignments turn students into complaint rule followers who are not given opportunities to pursue their interests and passions.
One of the biggest problems all educators face is unmotivated students. There are many theories related to the motivation of students. Dr. Albert Bandura pioneered the idea of self-efficacy. Bandura said the individual’s belief in his or her own ability would determine success (1986). Bandura noted some individuals have a greater belief in their own ability to succeed which translates into a self-fulfilling prophecy of achievement (1999). In later research Bandura also noted lower self-efficacy in some students is directly linked to ambiguity toward task instructions and thus the teacher needs to give very clear, explicit instructions to eliminate this impediment to student achievement (Bandura, 2012).

Carol Dweck (2006) said student attitudes usually fall into one of two categories – fixed and growth. Students who have a fixed mindset believe intelligence is fixed and that effort has no impact on achievement. They see no benefit to struggling and so give up easily. These are the students Peterson et al (1993) would categorize under the phrase “learned helplessness.” These students wait for someone else to do the thinking. They are content to sit back and simply say they don’t understand so that the teacher will “do all the heavy lifting” and spoon feed them what needs to be learned. This happens so often they come to expect it and simply wait to be told what to do and how to think.

Conversely, students with a growth mindset believe effort and hard work will result in the achievement of the task or goal and keep working until they achieve their goal. It is crucial for teachers to make it clear to students that achievement is related to effort and not innate intelligence or ability. Caine, Caine, Mc Clintic & Klimek (2015) make the point that less than one-third of families eat together. They ask how children are going to learn higher order thinking skills when “parents do not engage children in thinking, teachers tell them only facts but don’t tie the facts to the children’s own experiences, television doesn’t have them think and
analyze, and video games provide excitement without reflection” (2015). Although his research is related to leadership and dealing with employees, Fullan (2011) makes the point that “people need to compare themselves with themselves over time to assess their progress.” Fullan goes on to say there must be clear transparency so the individual can see the causal relationship between practice and results while making changes along the way. All of this can be applied to student motivation. Students need to see the causal relationship between their practice and results in order to see improvement over time.

While immediate success in a certain endeavor might come for a select few, most people must try something new at least a few times to get good at it. That ability to stick to something when immediate success doesn’t come is sometimes called “stick-to-it-tive-ness,” which is defined as both perseverance and persistence (Dictionary, 2003). Grit on the other hand not only encompasses perseverance and persistence but adds a third element related to long-term goal setting.

University of Pennsylvania Associate Professor Angela Duckworth defines grit as "sticking with things over the very long term until you master them,” (Hanford, 2012). When Duckworth was a teacher, she noticed there seemed to be little correlation between intelligence and achievement. Students with the highest IQs still had trouble, while students with lower IQs succeeded because they kept trying when others gave up. She noticed her successful students had something she came to define as grit (Hanford, 2012). Students with grit stay engaged with a difficult learning task and end up succeeding.

Duckworth left teaching for graduate school to pursue psychological research in the area of motivation and achievement. In her research, she gave candidates at West Point military academy a test to determine their level of grit. She used this test to determine which recruits
would stick it out to end and which candidates would bail out. Grit seemed to be a greater indicator of eventual success over such things as “intelligence, leadership ability or physical fitness” (Hanford, 2012).

With her University of Pennsylvania research team in tow, Duckworth looked at other venues where grit might play a role in success including the National Spelling Bee, the salesforce of certain companies, rookie teachers in tough neighborhoods and juniors in certain Chicago public schools. All the participants were given a survey to determine their level of grit. Once again the data indicated that grit is one of the most if not the most important factor in determining success in these various venues.

Duckworth noted parents and educators could build grit in kids. Grit can be cultivated by encouraging a growth mindset which posits that through hard work and dedication the individual can develop both talent and intelligence (2013). There is a growing body of evidence showing that the brain can improve over time under the right circumstances. This field of study is called neural plasticity (Huttenlocher, 2009).

No discussion of student engagement and motivation would be complete without a discussion of intrinsic and extrinsic motivators. If given a choice, educators prefer intrinsic over extrinsic motivators. In most classrooms, grades are the way most teachers measure success and failure. Unfortunately, Daniel Pink (2009) notes that an extrinsic motivator like grades can decrease motivation and even suppress creativity. Levinson (1973) characterizes grades as manipulation of students with the classic carrot and stick as opposed to motivating students to learn.

Marzano & Pickering (2010) relate there are four questions students ask themselves before they open themselves up to learning. Those questions include: How do I feel?; Am I
interested?; Is this important?; and Can I do this? The authors go on to say they define attention as a positive answer to the first two questions. If the answer to these questions is yes, the information from the outside world gets into working memory. Furthermore, if the information does not make it into working memory, the student will not have a conscious experience of it. Also, if the information is not considered interesting by the individual, working memory will not process it.

To increase engagement, students should be allowed to pursue their own interests and passions within the parameters of a digital media creation assignment. Such a change is reflective of thinking today that teachers should be a “guide on the side” and not a “sage on the stage.” Allowing students to take a more active role in their learning results in the individual dictating the pace and direction of their instructional needs (Bray & McClaskey, 2015).

Student-centered, personalized learning is getting greater attention in the literature. Brush & Saye (2000) make the argument that student-centered learning promotes critical thinking and problem-solving. At the same time, these two authors also note it is imperative for the teacher to properly structure the learning to achieve a good outcome. Otherwise, student "disorientation and frustration" are the result (Brush & Saye, 2000). By allowing students to personalize their learning, educators give students a sense of empowerment whereby they feel valued. Student engagement and motivation are the natural results of such an arrangement. For such an arrangement to work, there must be a good relationship between teacher and student (Patrick, Kennedy, & Powell, 2013).

For personalization to work in the classroom, educators must reject the old paradigm where the “teacher is the keeper of knowledge and imparts knowledge to the students” over the course of a school year (Alfred, 2009). The paradigm shift is for the educator to design
meaningful assignments aligned to standards while at the same time giving students the
opportunity to personalize their learning

According to Miliband (2006), there are five phases of personalized learning:

1. Assessment phase – Teacher and students work together in a formative manner to
   identify strengths and weaknesses.

2. Teaching and learning phase – Teachers and students select learning strategies.

3. Curriculum choice phase – Student chooses the curriculum, creating a pathway for
   student choice.

4. Radical departure from typical education models phase – Built on student progress,
   this phase provides teachers the flexibility to choose their own teaching strategies.

5. Education beyond the classroom phase – Using social and community connections,
   students personalize their surroundings (with the help of the teacher, when needed) to create
   their ideal learning environment.

While technology in and of itself is not the definitive answer as to how to engage
students, teachers who encourage students to use the tools of technology are helping these
young people to prepare for the future. Rather than being just another fad, early research into
technology integration suggests effective technology integration can have a positive impact on
student engagement and achievement (Wenglinsky, 1998)(Bain & Ross, 2000). Research
suggests that integrating technology into teaching and learning provides positive outcomes for
student learning, curriculum, and learning, online teaching and learning, professional
development as well as assessment and evaluation (Nebbergall, 2012). Nebbergall says research
indicates technology “improves student learning when it supports curriculum objectives”
(2012). She notes it is important for the project or lesson to align with state content standards
and that content presented online should be accurate and up-to-date. Finally, she observes teachers need professional development in educational technology and that “automated digital scoring can aid in the assessment of higher order thinking skills” (Nebbergall, 2012). Although primarily focused on audio books, Montgomery (2009) found that educators who encourage their students to use digital learning tools see positive changes in academic performance and on standardized tests.

Most educators are aware of the need for pedagogical knowledge and content knowledge, but there is now a need for technological knowledge (Koehler and Mishra, 2009). It is not sufficient to have knowledge of the technology, as productive technology integration must align with content knowledge and pedagogical knowledge. This interweaving, called TPACK—technological, pedagogical, and content knowledge—“is critical to effective teaching with technology,” (Koehler and Mishra, 2009). Koehler, Mishra, and Cain detail that the standard format of learning to use technology is insufficient; educators and districts incorrectly attribute technology use, thinking that “unlocking the power and potential of technology can be achieved by acquiring basic competency with hardware and software packages” (2013).

While no one has discovered the perfect way to integrate technology to improve student engagement, there is no doubt that using technology – such as a video camera and computer for editing – gets students interested in the content. Effective integration of technology demands that the educator understand the relationship between pedagogy, content, and technology. “There is no single technological solution that applies for every teacher,” (Koehler, Mishra, and Cain, 2013). To increase student engagement, all educators must learn about these emerging technologies as they come along and attempt to seamlessly mix the technology with their content knowledge and pedagogy.
Teachers cannot simply tell students to use some technological tool without first modeling what they want students to do with the technology. Students are well aware of how to use technology recreationally. It is up to teachers to show students how to use these same technologies in an academic setting. While students may be very familiar with using the video camera on their cell phone to record their latest exploits with their skateboard, they probably don’t have a clue how to use that technology to record a video showing their understanding of an important concept in an academic class. If used for a sound pedagogical reason like writing, cell phones can enhance the learning process (Swan, Hooft, & Kratcoski, 2005). In classrooms and school districts across the country, many educators and school districts look upon the cell phone as a nuisance and a distraction as opposed to a device that might increase student engagement.

Teachers continue to be a vital link in student learning. Teachers model how to use technology in an academic setting and gradually turn over control to the student who demonstrates his learning independently (Murphy, DePasquale, & McNamara, 2003).

Offering students an opportunity to show their learning through digital media creation personalizes the learning because it puts the student in charge of the time and place and pacing of the learning (Grant & Basye, 2014). Dorow & Boyle almost 20 years ago were writing that allowing students to use technology contributed to higher levels of student preparation and satisfaction with their classes (1998).

Technology should not be used just for the sake of using technology. The teacher must model the appropriate use of the technology and design learning environments that promote student engagement and success. While the degree of engagement and motivation of each student is certainly an internal factor, there is much in the literature about the importance of a
positive relationship with the teacher. When teachers make an effort to form a positive relationship with their students, they create a positive climate so that higher levels of motivation and engagement result (Hamre & Pianta, 2001). The authors go on to point out students who have a comfortable relationship with the teacher feel secure enough to branch out and try new things socially as well as academically.

With financial backing from the Pew Charitable Trusts, researchers developed the National Survey of Student Engagement (NSSE) and began testing in 2000 at 275 colleges and universities (Buckner et al., 2016). Ever since then student engagement has continued to be a focus area for researchers. Buckner et al. (2016) go on to report benchmarks are available nationally in five areas: level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment.

While allowing students to become creators of digital content rather than consumers of content is certainly a worthy goal, it seems that student engagement is a side benefit. Weis, Benmayor, O’Leary, & Eynon (2002) note that “digital media are empowering students to become researchers, storytellers, historians, and cultural theorists in their own right.” For example, The University of Exeter Business School has dealt with “unexpectedly large student numbers” and an increasingly diverse student population by using digital filmmaking to increase student engagement (Wanke & Blessinger, 2012). The article goes on to observe that both teachers and students have adapted quickly to using digital filmmaking technology. Furthermore, the use of digital filmmaking "enables learners to become reflective and self-directed, analyzing their understandings through interaction with others, creating meaning, acquiring and testing knowledge and opinions in a social context and building on the perspectives and views of others" (Wanke & Blessinger, 2012).
Literature related to the topic

Researchers have written much about the integration of the arts into the regular curriculum. Two of those arts would be digital storytelling and filmmaking. Calling the young people of today "digital natives" originated with Marc Prensky (2005). Today’s young people have grown up with the necessary technology for digital storytelling and filmmaking. The latest statistics from YouTube indicates 1.3 billion people use YouTube; users upload 300 hours of video to the site every minute; users watch 5 billion videos on YouTube every single day; and on an average month, 8 out of 10 18 to 49-year-olds watch YouTube (2017). Adolescent digital natives are not only are comfortable with using digital tools; they actively use all forms of technology with great skill and aplomb. A Pew Internet & American Life Project Study noted 87% of children, ages 12-17, self-report using the Internet (Lenhart, Madden & Hitlin, 2005). Furthermore, 51% of that group goes online daily. Just two years later, another Pew study looked at the use of social media and found teen use of the internet had ticked up six percentage points to 93% (Lenhart, Madden, Macgill, & Smith, 2007). Another study, this time by the Kaiser Foundation, noted 26% of all 11-14-year-olds use a computer more than one hour each day (Roberts, Foehr & Rideout, 2005). Amazingly, the same study found adolescents between the ages of 11-14 spent 30% of their day interacting with various form of media. Even more incredible is the finding that this group will multi-task and listening to music, instant message and surf the internet. All this is second nature to digital natives.

While the digital natives are quite comfortable using technology, they are not as adept at harnessing these technologies for academic purposes. This is why it is essential for educators to teach young people to use these technologies to leverage their thinking.

Being able to use current technological innovations and collaborate with other people is an essential skill. As mentioned earlier, students are certainly familiar with and regularly use the
latest technologies. While this is true, it is also true that they may not possess the necessary skills to effectively navigate the digital work environments of the 21st Century. Burkhardt et al., (2003) identify four key components of 21st-century literacy: digital-age literacy, inventive thinking, effective communication, and high productivity. The authors relate students need to sift through a lot of information and then think creatively and critically about the application of that information to a particular problem. Higher order thinking skills in the job market of the future are not optional; they are required for survival.

Literacy in the digital age stretches beyond the basic literacy of reading and writing. Students today must be masters of higher order thinking. They must be familiar with the issues of the day and implement scientific principles of thought to solve real-world problems. Burkhardt et al. (2003) address communication skills and observe that 21st Century skills include planning, prioritizing and executing plans to bring about the desired outcome.

Educators today are preparing young people for jobs that don’t even exist yet. In the book, Tough Choices or Tough Times: The Report of the New Commission on the Skills of the American Workforce, it is pointed out that the skills needed for success in the 21st Century are different than the skills needed in the past.

The authors speak of a kind of leadership that does not depend solely on technology. For countries to thrive in the new economy, workers need to exhibit leadership that: “. . . depends on a deep vein of creatively that is constantly renewing itself, and on a myriad of people who can imagine how people can use things that have never been available before, create ingenious marketing and sales campaigns, write books, build furniture, make movies and imagine new kinds of software that capture people’s imagination and become indispensable to millions.”
The Partnership for 21st Century Skills published a national poll in 2007 indicating that 99 percent of voters felt the nation’s future depended on young people learning 21st Century skills. Some of these essential skills enumerated by Burkhardt et al. (2003) are listed below:

- Basic literacy – including scientific, economic and technical.
- Visual and information literacy.
- Multicultural and global literacy.
- Inventive Thinking.
- Flexibility, grappling with complexity, and self-direction.
- Creativity, curiosity, and risk-taking.
- Higher order thinking – including critical thinking and problem-solving.
- Effective Communication.
- Collaboration and interpersonal skills.
- Interactive communication.
- Civic responsibility.
- High Productivity.
- Prioritize, plan, and execute for results.
- Effective use of tools.
- Ability to produce high-quality products.

One of the goals of education is to prepare young people for the future. To carry out this mission, it is essential that educators teach higher order thinking skills and model these 21st Century skills. Teaching these skills is not just putting a technology tool in the hands of a student without guidance and instruction. There is enough of that with the frivolous use of technology that is exemplified by the social media trend to take a picture of one’s lunch or
dinner and send it to the internet. Educators must teach students to pair up these technologies with their human brains. Educators must remember they teach children, not technology or a particular subject.

There is much in the literature about how the arts stimulate brain growth. Specifically, there are many articles about digital filmmaking and digital storytelling. Many literature books recognize this fact and even include sections on how students can use digital tools to show their learning and how teachers can assess that learning by grading the end product with a rubric. Digital storytelling and filmmaking represent one way that students can show their learning as opposed to a traditional test or a quiz. Brian Bailey in *Lights! Camera! Action and the Brain: The Use of Film in Education* talks about how digital video production “holds powerful affective capacity for making sense of and effecting changes to peoples’ lives” (2012). In other words, what was once in the hands of big studios in now in the hands of the average person. Anyone with a smartphone has everything they need to communicate a story to the world.

While not the focus of this paper, there is much in the literature about project-based learning. These articles on project-based learning identify digital media creation as one of the ways students can create an end product that shows their learning. One teacher who has wholeheartedly embraced project-based digital filmmaking in his class is Jim Bentley of Foulks Ranch Elementary School (Boss & Krauss, 2014). Bentley describes how he slowly started introducing filmmaking projects into his classes. As he and his students gained more experience, they improved production values and eventually created something called Curiosity Films. This production company has produced documentaries and commercials for local businesses.
Anne Shaw, Founder and Director of 21st Century Schools, posits that one of the most powerful forms of project-based learning is videography or filmmaking (2009). She goes on to say that a project-based learning activity like filmmaking "provides students with an opportunity to engage the curriculum at very high levels, enables students to develop critical 21st-century skills and multiple literacies for the 21st century" (2009). Some of the ways Shaw envisions students using filmmaking to showcase their learning includes:

- Feature-length films.
- Mini-documentaries - such as those shown on the History Channel, the Science Channel. The Biography Channel, the Discovery Channel.
- Mini-dramas or series.
- Public Service Announcements.
- Political Campaigns.
- News Shows.
- Entertainment Shows.
- Guest Talk Shows - interview experts on various issues and topics in your community and broadcast the shows live on television or radio.
- How-To Shows - from study skills to building a skateboard, physical fitness, and health, gardening, cooking, etc.

**Specific literature on filmmaking and digital storytelling in the classroom**

Student filmmaking in and of itself is nothing new. Hobbs and Moore (2014) examined the youth media movement and traced the origins back to the amateur filmmaking of the 1950s and 60s. The authors create a linkage between the past and present practices of media creation. While filmmaking by *film* students is certainly nothing new, getting students in math, science,
history and English classes to use the discipline of media creation to show their learning is not exactly a mainstream idea. On the other hand, it does seem to be catching on as some teachers bravely experiment with the idea.

The digital revolution extends beyond the camera to the computer so that the footage can be edited together fairly easily using the free software that comes with most computers. Additionally, teachers do not have to be experts on the use of technology for filmmaking as most students are very comfortable working with cameras and computers. These students have grown up using technology. As mentioned earlier, Prensky calls the present generation of students digital natives (2005). One interesting development is that many of the new teacher graduates would also be considered digital natives. This new generation of students and teachers is completely comfortable with the latest social media and communication technologies. It is important for teachers from previous generations to familiarize themselves with these technologies and find ways to incorporate them into student work.

There is a good reason to attempt to merge traditional subjects with student-created media creation projects. Mills, Comber, and Kelly (2013) make a distinction between literacy practices that only happen in the head of the student as opposed to externalizing the learning by creating a digital story or creating a film. So often, students are asked to remember something only long enough for a test. That kind of outlook sends the subtle message that the content is not that important.

Additionally, Mills et al., believe educators have a responsibility to transform young people from consumers of content to producers of content. Although the standards these three researchers talk about are Australian standards, they sound surprisingly similar to the English standards in the United States. In a nutshell, Mills et al., look at the benefits of taking the
learning from the confines of a classroom out into the real world, or to use a pun the "reel" world. The authors conclude student learning is enhanced by taking students out of the confines of the classroom and allowing them to explore and sense their world through the process of producing video content. Digital storytelling and filmmaking are such great instructional strategies because students must transform concepts in their head to a digital medium which usually results in greater engagement with the subject matter and ultimately greater understanding.

Looking specifically at filmmaking, Tilleczek and Loebach (2015) boldly proclaim that the process of filmmaking causes the content to stay with the student long after the project is over. In their research, they talk about how filmmaking has a unique ability to engage young people in content. Many times students will memorize the content long enough to take a test and then promptly forget what they learned. Conversely, the content in some classes stays with the learner long after the class is over. Filmmaking engages students on so many levels that the content stays with them long after the class is over.

There are several studies dedicated to the use of technology in the social studies classroom that focus on technology as a pedagogical tool as well as a subject of discussion (Berson & Bolick, 2007; Berson, Lee, & Stuckart, 2001; Martorella, 1997; Whitworth & Berson, 2003).

Digital access through the Internet to vast reserves of knowledge and information enables students to act as amateur historians and create products that previous generations could only dream of producing (Singleton & Giese, 1999; Van Hoover, Swan, & Berson, 2004).

Shul (2014) describes how the emergence of desktop computers and simple editing programs on both the Mac and PC resulted in video productions for weddings and high school
graduations. From these beginnings, teachers began to see the potential for classroom topics that students could explore through these desktop documentaries. And thus, digital storytelling was born.

He goes on to talk about a YouTube video titled Truman's decision that ended up winning the 2006 National History Day documentary-making content. In the documentary, the student talked about the nature and impact of U.S. President Harry Truman's decision to drop atomic bombs on the Japanese cities of Hiroshima and Nagasaki.

Shul examines two schools of thought and the merits of each concerning documentary filmmaking. He explains teachers can insert filmmaking projects into the curriculum throughout the year. On the other hand, educators can schedule the projects at the end of the school year. There are benefits and liabilities for each of these approaches.

Steelman (2005) observes students benefit from creating multimedia projects because collaboration is an essential part of the process. She also noted these kinds of projects benefit all students, not just the gifted. She went on to say the best presentations sometimes come from average students.

Even medical students seem to benefit from making films. Mahajan (2012) makes the point that short film is a great vehicle for communicating the distresses of the medical student. He goes on to show that filmmaking is a fantastic aid in reflection for the student as well as raising awareness of issues in the medical profession. It would appear the process of filmmaking can be used in just about any area of study to enhance the learning.

One researcher looked at attitudes of students from rural backgrounds that were given a chance over a summer to use digital technology to produce films. She found most students had a positive attitude toward using the tools of filmmaking to communicate a message (Lee, 2016).
In other words, students develop pride in the work and seem to enjoy the final product as well. Lin, Grauer, and Castro (2011) discovered similar results when they examined the Gulf Island Film and Television School. Lin et al. (2011) recounted the benefits of allowing rural youth to explore their strengths as they set about the task of making a film.

It seems young people today are eager to show their learning through means other than traditional paper and pencil. In one study, Bryer (2014) looked at the favorable response of students, teachers and university tutors to the process of making films on tablet computers. One of the benefits of recording scenes digitally is that the footage is available immediately and students can critique and reshoot anything that didn’t quite hit the mark. Bryer (2014) went on to observe that student filmmakers tend to take a culturally-relevant approach.

Besides the educational benefits of externalizing the learning into a final product like a film, there is also the social aspect of creating a film. When researchers ask employers what educators need to be teaching students, one buzz phrase always comes up – soft skills (Shultz, 2008). While students today seem to have the hard skills mastered, many of these same young people seem to lack the soft skills related to being a good employee and interacting with other people. Students today know a lot about a lot of things. But they don’t seem to know how to get along with others and work in teams.

Successful filmmaking in the classroom requires – even demands – good social skills and teamwork. LePage and Courey (2011) talk at length about the social challenges facing children and adolescents with autism. They talk about the use of filmmaking as a means of developing and improving social skills in children with Autism Spectrum Disorder. While the authors of the article solely focused on the social aspects of filmmaking for the identified
population, they also noted that there are more than just academic reasons to use filmmaking in the classroom. The collaborative aspects of filmmaking enhance social skills.

Kress (2003) points out:

. . . the broad move from the now centuries-long dominance of writing to the new dominance of the image and, on the other hand, the move from the dominance of the book to the dominance of the medium of the screen. These two together are producing a revolution in the uses and effects of literacy and of associated means for representing and communicating at every level and domain (p.1).

Other educators and researchers are talking about this shift as well. Ranker (2007) notes filmmaking gives students opportunities to work across modes and that filmmaking mirrors how society communicate in this new media age in which we live.

For those individuals who might incorrectly interpret this to mean the printed word is going away, that is not the case at all. What is changing is the means by which the word is being created and used. In filmmaking, a script is still the heart of the production. A script means a writer is using words to create and outline the process of filmmaking. To use a cliché, the pen is still mightier than the sword. The only difference is that now the pen is a stylus on an iPad or the keyboard on a laptop.

Hollywood may hold the key for educators looking for a promising student engagement strategy to add to their toolbox of ideas. More specifically, educators can tailor the process of filmmaking into a fun, student-centered, content-rich, situated-learning assignment whereby students engage with the lesson for long periods of time. Who doesn’t get excited when they hear those iconic words, “Lights, camera, action!” The three essential steps to produce a film or
video – writing a script, shooting the scenes and editing to produce a final product – require students to collaborate with each other and deeply think about the final product.

One appealing aspect of filmmaking in the classroom is that students learn the educational content almost by osmosis. They are exposed to the content when they write the key concepts in the script. They hear it as they operate the camera or say the lines. They hear it yet again when they are deciding where to make the cuts in editing. And finally, as they watch the finished product they have created, they are once again being exposed to the content. For the process to be successful, students must also be made aware that the final video will be published for all to see thus making it an authentic product with an authentic audience.

Finally, many educators recognize that popular culture is a way to engage and motivate students (Dune, Bidewell, Firdaus, & Kirwan, 2016). As has been stated from the very beginning, filmmaking assignments should be one of the many tools in the arsenal of educators to engage and motivate students as they use higher order thinking skills to create an end product to showcase their learning and understanding of a particular learning objective.

The overwhelming conclusion seems to be that any teacher can use filmmaking and digital storytelling to enhance any subject. The advent of digital filmmaking makes it possible for students to use the filmmaking process as a means of showing and solidifying their learning. The research indicates teachers who put a little effort into learning the necessary technical aspects of filmmaking and digital storytelling are satisfied with the results. Is filmmaking something that should be used every day in the classroom? Of course not. But can filmmaking and digital storytelling be one more tool in the arsenal of a well-rounded teacher? The answer seems to be yes.
Summary

The purpose of this study was to determine the impact of digital media creation on higher order thinking skills and student engagement in the middle school classroom. This review of literature examined the broad historical literature on the topic. The review went back in human history as far as possible beginning with cave dwellers. The review identified three key precursors to digital media projects – painting, acting, and writing. Pivotal moments in those three categories, whether artistic or technological, were identified and discussed. The literature review also identified two theoretical lenses – higher order thinking skills and student engagement – through which a reader may view the research. Additionally, the review examined broad literature related to filmmaking and digital storytelling in the classroom. Finally, the review narrowed to studies similar to one outlined here whereby the researcher studied the efficacy of using filmmaking and digital storytelling techniques in the classroom for learning objectives.
CHAPTER THREE

Methodology

Purpose of the Study

This study set out to determine if assigning digital media projects to students encouraged higher order thinking skills and resulted in higher levels of student engagement. Teachers were surveyed to see if they had seen this phenomenon in their classrooms. Again, the two overriding questions that guided this study follow:

1. Does integrating digital media creation into the curriculum encourage higher order thinking skills?
2. Does integrating digital media creation into the curriculum increase student engagement?

Qualitative Research Approach

Qualitative research is characterized by a large-scale examination of an area of “burning interest” to the researcher (Silverman, 2015). By its very nature, qualitative research generates words rather than numbers. These words must be coded by attaching labels to them to develop patterns that can be interpreted by the researcher (Silverman, 2015). To some, this type of research may seem imprecise and open to interpretation; however, for some topics, qualitative research is the best way and may be the only way to approach a particular topic. Rather than looking at qualitative and quantitative research as being competitive with each other, Silverman notes the proper relationship is cooperative as the qualitative researcher paves the way for the quantitative researcher by first establishing the “how” and “what” of a particular area of interest (2015).
Since this study was grounded in the viewpoints of the teachers who were surveyed and interviewed, it met the definition of Grounded Theory. Glaser and Strauss originated systematic grounded theory in 1967 (Glaser & Strauss, 1971). The researchers administered open-ended interview questions at the beginning of the project. The questions were carefully crafted to determine if higher order thinking skills and student engagement resulted from the digital media creation projects. These questions gave the researcher a window into the mind of teachers concerning the benefits of digital media creation projects. A Google form was created to capture and chronicle the observations of the teachers in the classroom. See Appendix B. All observations were transferred automatically to a Google spreadsheet for analysis. The researcher transferred these statements from the Google spreadsheet to a Google document for further analysis.

The researcher used open coding to create labels for the emerging concepts as he identified trends from the interviews and focus group. The open coding stage of the study ended when it was determined all data have been examined and categorized.

Data sources included teacher survey responses, teacher interview notes and focus group commentary, and notes. A member check, also known as informant feedback, was conducted to verify the findings of the study. By giving all the participants online access to a rough draft of Chapter Four, every respondent could challenge or clarify their original submissions. Since the researcher can misinterpret what a respondent communicates in a survey and an interview, the member check allowed the interviewees to review their interview responses and comment on whether the responses were interpreted correctly.

Peer debriefing was also employed as yet another technique to ensure the validity of the research. Denzin and Lincoln (1994) observe that peer debriefing increases “the credibility of a
project.” By seeking out an impartial peer to read over the findings, the researcher will avoid such pitfalls as overemphasized and underemphasized points, vague descriptions, general errors in the data as well as biases and assumptions by the researcher (Denzin and Lincoln, 1994). A retired English teacher agreed to look over the rough draft and share any criticism, commentary or suggested edits with the researcher.

**Description of specific research approach**

As stated previously, the researcher approached the data from a grounded theory perspective. The approach was a good fit because the study will be grounded in the viewpoints of the teachers who were interviewed and surveyed. The researcher selected two theoretical lenses – higher order thinking skills and student engagement – through which to view and interpret the data. The questions in the survey, as well as the interview questions, were crafted by the researcher to get at the teacher-perceived benefits of student-created digital media projects. The survey was completely electronic, and no paper surveys were distributed. The researcher calculated a 49.15 percent participation rate by dividing 29 respondents into 59, the latter number being the total number of teachers who could have responded. Question types included opened ended; closed-ended; discrete (yes/no); and rating scales (Marsden & Wright, 2010).

**Participants and setting**

The researcher readily admits to using convenience sampling as he asked the teachers at his school to respond to a survey, answer interview questions and participate in a focus group. While selecting this group of teachers was indeed convenient for the researcher, this paper contends these teacher comments and viewpoints should be representative of many classrooms across the country. Twenty-nine teachers participated in the initial survey. The researcher
interviewed five teachers concerning two major concepts that emerged from the survey. Finally, four teachers participated in a focus group and commented on eight statements that emerged from the survey and the interviews.

**Data Collection Tools and Procedures**

A request for permission to conduct research was submitted to and approved by the principal. Convenience sampling was used to collect data from the teachers. All teachers in the school were sent a Google form with a request to respond from the researcher. While the sample was convenient, it should also be representative of many classrooms in America. While the entire faculty of the school did not participate in the study, 29 teachers or slightly less than half the staff did respond. Seven social studies teachers responded; five English Language Arts teachers responded; five special education teachers responded; five science teachers responded; two math teachers responded; one media class teacher responded; one music teacher responded; as well as one physical education teacher responded.

Seven teachers from this group submitted responses deemed by the researcher to be interesting and worthy of further investigation. While these seven were contacted through email by the researcher, only four responded back agreeing to an interview. Last, an asynchronous online discussion forum was set up for the four teachers who agreed to serve on the focus group.

**Data Analysis and Coding**

As mentioned previously, data analysis involved grounded theory and a systematic process for logging all comments and observations of the researcher and the participants. On a line-by-line basis, various words and phrases were categorized and carefully analyzed to determine trends in the research. As to the coding, keywords and concepts were identified to create categories to allow similar comments to be grouped and analyzed. A coding document on
Google drive was created to allow for copying and pasting of similar statements together. These phrase and statement clusters were also color-coded to provide a quick way of seeing the extent to which the respondents were saying the same thing. Silverman observes that “asking few rather than many interview questions encourages research participants to tell their stories and discourages their interviewers from preconceiving the content of the interview “(2015). For the interviews, the participants were asked two vital questions and prompted for elaborate explanation. The questions follow:

1. Of the two proposed benefits associated with student-created digital media projects – higher order thinking skills and student engagement – which one seems to have a stronger connection in your opinion? Why?

2. If someone were to press you on the question of HOW did the digital media projects you assigned contribute to higher order thinking skills and student engagement, what would you say?

Focus group participants were given access to a rough draft copy of Chapter Four as well as eight key statements from the research and asked to comment on them. They were also asked to reply to the comments of their fellow committee members if they so desired. Participants were encouraged to share their thoughts even if and especially if they were divergent from the original statements.

**Ethical Considerations**

Teachers were not coerced to participate in the study. While the principal did announce over the intercom reminding teachers of the survey, she did not tie participation to any positive or negative actions. She did say participation would mean a lot to the researcher and help him in his research. The survey request was sent out by email asking teachers to participate. The
request merely explained the benefits of the research and assured the participants of their anonymity should they respond to the survey. The survey itself encouraged all teachers to respond regardless of how much they assigned student-created digital media projects. This measure helped reduce bias since all teachers and not just those assigning digital media projects were encouraged to participate.

**Trustworthiness**

The study is valid and reliable because all respondents were given access to a rough draft of Chapter Four and encouraged to make changes to their comments. While the researcher had removed teacher names and had given generic titles to all the respondents, he assumed the teachers could read through the chapter and pick out their comments. Again, this is known as a member check and is one way to ensure the researcher did not misinterpret anything the respondents shared.

Another important way to establish validity and reliability is to use corroborating evidence from additional data sources. The researcher did not just rely on the survey. He conducted teacher interviews. Additionally, a focus group was established to examine some of the statements to come out of the survey and interviews.

**Potential Research Bias**

The researcher readily admits his background in mass communications and that he enjoys communicating using technological tools. Because of his interest in digital media, the researcher could be tempted to report favorably about digital media projects and to discount more traditional means of teaching and learning. Additionally, there is the temptation to inflate the importance of one’s findings. While the researcher certainly enjoys creating digital media
projects, the researcher allowed the data to take its own trajectory and not conform to preconceived ideas.

**Limitations**

Since the research took place in a middle school, a critic might argue that the findings have no bearing on elementary or high school students. While 30.3 percent of students in the school meet the definition of economically disadvantaged, a critic might argue the findings might not apply to schools with even higher levels of economic disadvantage. Since the school in question had good access to technology most of the time, a critic might argue that schools with less access to technology would not get the same results.

**Summary**

This chapter began with a broad examination of qualitative research, narrowed to the specific approach to studying student-created digital media projects in the classroom and detailed the study participants and setting. Furthermore, this chapter closely examined the data collection procedures, the ethical considerations as well as the data analysis procedures. Finally, the chapter examined ethical considerations, trustworthiness, potential research bias, and limitations.
CHAPTER FOUR

ANALYSIS OF DATA

The purpose of this grounded qualitative study was to examine the teacher-perceived benefits of student-created media projects on higher order thinking skills and student engagement. The two questions that guided this research follow:

1. Does integrating digital media creation into the curriculum encourage higher order thinking skills?
2. Does integrating digital media creation into the curriculum increase student engagement?

Presentation of Participants

All 29 of the participants work in a public school in middle Tennessee serving students in grades sixth through eighth. The school employs approximately 59 teachers and serves over 900 students. According to the 2016-17 Tennessee State Report Card for this school, 30.3 percent of students meet the definition of economically disadvantaged. Also, 13.4 percent of students at the school have a disability. Ethnic make-up is 90.5 percent white; 5 percent Latino or Hispanic; and 3.3 percent black. The remaining 1.2 percent is not identified.

The entire faculty was sent a link to a Google form requesting voluntary responses to several questions about the use of digital media projects in their classrooms. See Appendix B. All teachers, even those who did not use digital media projects in their teaching, were asked to respond to the questionnaire to determine both benefits and hindrances associated with digital media in the classroom. Five teachers were interviewed further to get more data on specific assignments they used in the classroom. Finally, four teachers served as a focus group to further refine the data.
Analysis of survey data

One of the first questions placed before the teachers involved how often they used student-created digital projects in the classroom. Possible responses ranged from never then moved through the following progression: once or twice a year, three or four times a year and finally five times a year or more.

Eight of the 29 teachers, or 27.5 percent of respondents, said they did not use any digital media projects in the classroom. Conversely, 72.5 percent of the remaining respondents assigned digital media projects during the school year with teachers using the strategy in varying degrees from one to five times or more per year.

Table 1
*How often the teacher assigns digital media projects*

<table>
<thead>
<tr>
<th>Respondent number</th>
<th>How often?</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>12</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>27</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>26</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>4</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>15</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>1</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>6</td>
<td>Five times a year or more</td>
</tr>
<tr>
<td>3</td>
<td>Three to four times a year</td>
</tr>
<tr>
<td>14</td>
<td>Three to four times a year</td>
</tr>
<tr>
<td>29</td>
<td>Three to four times a year</td>
</tr>
<tr>
<td>8</td>
<td>Three to four times a year</td>
</tr>
<tr>
<td>17</td>
<td>Three to four times a year</td>
</tr>
<tr>
<td>21</td>
<td>Three to four times a year</td>
</tr>
<tr>
<td>5</td>
<td>Once or twice a year</td>
</tr>
<tr>
<td>13</td>
<td>Once or twice a year</td>
</tr>
<tr>
<td>24</td>
<td>Once or twice a year</td>
</tr>
<tr>
<td>9</td>
<td>Once or twice a year</td>
</tr>
<tr>
<td>16</td>
<td>Once or twice a year</td>
</tr>
<tr>
<td>7</td>
<td>Once or twice a year</td>
</tr>
<tr>
<td>18</td>
<td>Once or twice a year</td>
</tr>
</tbody>
</table>
No digital media assignments for the year

The group of eight teachers who reported no use of digital media projects in the classroom gave various reasons explaining why they did not assign student-created digital media projects. Respondent 2 noted “I am a first-year teacher who is still figuring how best to teach and assess students. I would love to possibly use digital media projects in the future.” Another teacher, respondent 10, stated: “I am not familiar enough with digital media projects to ask the students to do them.” Respondent 11 had a similar comment with the simple statement “I don’t know a lot about them.”

Respondent 19 reported, “I did not get to do the project that I had wanted to due to not having access to the technology at the right time for a project due to testing schedules. Remaining reasons included the following: Respondent 22 said, “Not applicable for my room at this time; Respondent 23 said, “Takes too much time away from other lessons that need to be taught; Respondent 25 said, “I teach a scripted program and do not have time to incorporate digital media projects; and finally, Respondent 28 said, “Didn't have the technology to use for my class. Plus, most students don't understand it.”

When asked if they had ever taken classes in their schooling that required them to produce a digital media project, five of the eight teachers answered in the affirmative.
researcher further probed those five as to whether they enjoyed producing the digital media project, all five answered in the affirmative.

**One or two digital media assignments for the year**

Seven of the 29 teachers, or 24 percent, said they assigned a digital media project once or twice a year. The majority of teachers in this category primarily used slideshows as the digital media project of choice. Only one teacher in this group reported assigning video creation to students. The slideshows were primarily used to review chapter material and reinforce vocabulary. One teacher in this group asked students to create a children’s book. Two of the teachers gave an assignment that involved demonstration and explanation. The topics for these two assignments included Newton's Laws of Motion, drugs and body systems.

**Three or four digital media assignments for the year**

Six teachers of the 29 respondents, or 20 percent, said they assigned a digital media project three or four times a year. One teacher in this group, Respondent 21, said students teach the class on certain days and are encouraged to use power-points, picture slideshows, and videos. Another teacher, Respondent 29, said students in her science class had submitted both video and Google slideshow assignments.

Respondent 8, a social studies teacher, asked her students to create a slideshow to inform "tourists" about the specific ancient settings studied in a particular unit. The slideshows included facts about the population, climate, famous people from that area, things to do and places to eat. Respondent 17, another social studies teacher, noted she also had her students create a slideshow depicting daily life during Roman times.

Respondent 3, an English teacher, said her students were given choices to present books and literary concepts with all of the media mentioned in the survey question. Media mentioned
in the question included filmmaking, digital storytelling, making a video, vlogging, podcasting, recording a newscast and creating a slideshow. Another English teacher, Respondent 14, noted two or three students were grouped to work on a three-minute biography presentation on a famous person. She went on to say her students are encouraged to make a slideshow with book recommendations to include a cover photo of the book, the title, author, and a written statement covering why other students would enjoy this book. She stated, “The slides were shared with the teacher who placed them in a slideshow and shared with the librarian who showed it during class library times for various grades throughout the school.” Besides slideshows, this same teacher, Respondent 14, had students complete an online scavenger hunt to learn about the background of the class novel “The Outsiders” by S. E. Hinton. Additionally, a few select students shared a photo assignment with the teacher, and the teacher projected the finished assignment.

Since respondent 14 also taught a related arts class on personal finance, she had her students search online for cars to purchase. The assignment involved having the student locate the car, determine its price, and determine monthly payments required and monthly upkeep costs as well as estimates for the expenses of gas and insurance. The students submitted either a Google doc or a Google slideshow which they then presented to the class.

**Five or more digital media assignments for the year**

Eight out of the 29 respondents, or 27.5 percent, said they assigned a digital project five times or more during the year. Over half of the teachers in this category, five, mentioned video creation as one of the student-created digital media projects students complete.

Respondent 12, a music teacher, observed that her students record their singing or playing performances. Respondent 15, a social studies teacher, stated students are asked to
complete a video of varying lengths depending on the assignment. He went on to say the assignment could be animated, real-life action, or musical. The material must cover such topics as the Declaration of Independence or the Shot Heard Around the World. Respondent 4 mentioned video in addition to Google slides, docs and creating online timelines. Respondent 20, who teaches filmmaking as one of the related arts, stated his students make short films as well as create marketing materials and journalism articles. Respondent 1 specifically stated, “Students have created slideshows to review previously taught concepts. I have had students create slideshows for new vocabulary (slide show had word, definition, and picture to represent a word). Students have created digital flashcards. Students have created Google Drawings of cell diagrams. I have had students create a video presentation where they narrated their slideshows.”

Respondents 26, 27 and 6 noted slideshows were the go-to assignment for most student-created digital media projects in their respective classes. Respondent 26 specifically mentioned an Innovation Project which requires students to create a slideshow listing inventor, the purpose of innovation, impact on society and other innovations it inspired. Respondent 27, a science teacher, pointed to his related arts careers class as the place where his students are most likely to use Google Slides. Respondent 6 said her students use PowerPoint documents in her class.

**Types of assignments**

Table 2 below summarizes the responses to the type of digital media used in the classroom. Because certain respondents used more than one of these strategies, their responses can be found in more than one category.

Table 2  
*Types of digital media assignments*
Impact on higher order thinking skills

When asked to describe the impact student-created digital media projects had on higher order thinking skills in their classrooms, 21 teachers made statements indicating they believed there was a correlation between the two.

Four teachers responded to this question by specifically using the word create in their responses. Respondent 29 wrote “create” in all caps and said, “Anytime students have to CREATE something or put it in their own words, it takes a lot more of the higher order processing skills.” Respondents 1, 9 and 24 also specifically mentioned creating. Respondent 9 mentioned teaching the material to others, while respondent 24 said creating content results in greater degrees of retention.

Creativity was also mentioned by a couple of teachers as well. Respondent 16 said, “Students are open to using their creativity to demonstrate Newton's Laws.” Respondent 18 said students who are willing to combine their research with creativity gain much from the digital media projects. Respondent one noted digital media projects tap into the creation and synthesis part of higher order thinking.
Another teacher, respondent 14, spoke of a biography project that required synthesis and analysis. She went on to note the project required evaluation on the part of the student. This teacher further explained student-created digital media projects were “worthwhile tools in a larger set of projects used throughout the year.”

Seven teachers gave answers indicating the student was going beyond the textbook, lecture and traditional ways of showing their understanding of the material. Respondent 8, a social studies teacher, stated her students wrote their narratives and dramas based on ancient society. She noted students not only called upon their knowledge of history, but they added their own spin on what may have happened behind the scenes of the historical decisions being made. Respondent 21 also related how student-created digital media projects allow students to develop more cognitive responses to a prompt as opposed to simply reading and writing material. Respondent 5 said her students got more out of the chapter requiring a digital media project than any other chapter in the book. She thought the reason was that students had to look for important details and “know the information so that they could put it in words that children would understand.”

Two of the respondents mentioned the importance of research. For example, respondent 13 said the research needed to complete the slides helped the students better understand the material. Respondent 26 said students get better at researching reliable sources to add to their presentations.

Five of the respondents gave unique answers to the question that did not fit into the previously mentioned classifications. Respondent 17 said student work was more detailed because they used complex vocabulary. Respondent 15 stated, “By writing the script and performing it, the students had to use advanced thinking skills.” Respondent 3 said she
observed problem-solving skills. Respondent 12 said the video seemed more permanent to students and they put more effort into it. Respondent 20 noted “using digital media requires students to not only understand the curriculum, but they must also figure out the best way to communicate this understanding to others. This requires a greater level of reflections on one’s ideas.’

Three teachers made statements indicating they did not think student-created digital media projects had much of an impact on higher order thinking skills. One teacher, respondent 27, chose not to answer the question. The three teachers who answered in the negative on this question gave the following statements: Respondent 6 said, “Not a whole lot. They basically stuck to the facts.” Respondent 7 said, “I don’t believe that there was a lot of higher order thinking skills.” Respondent 4 stated, “Honestly, I feel like this is hard to answer. Not sure it has necessarily affected higher order thinking, other than typically apathetic students seem to show more effort.”

**Impact on student engagement**

Teachers were also asked about the impact of digital media projects on student engagement. Four of the 29 respondents indicated students seem to learn the material better when they are required to produce a digital media project. Respondent 17 simply stated, “They understood the content better.” Respondent 8 elaborated on this idea further by giving a specific example and stating, “They were better able to understand the life and culture of the ancient time period. They also made connections as to the impact of ancient society on society today.” Respondent 21 said students grasp the concepts better because they are getting to use the technologies they use in their daily lives. Expounding on this idea even further, Respondent 24 noted, “Students are more engaged in their learning and research topics more thoroughly.”
Three other teachers spoke about an increase in student interest when the learning involves a digital media project. Respondent 4 simply observed, “I feel that when given digital format assignments, students interest increases.” When students are allowed to present their learning to the class through a digital media project, respondent nine said students seemed to be more engaged with the content.

Respondent 29 used the term captive audience when describing the classroom tone when fellow students are present their findings through a digital media project. Additionally, she explained that she does not require digital media projects because not all students have equal access to the internet. She went on to explain she has other menu options for these students. Respondent 3 seemed to agree with this stance when she stated, “Students would rather respond with media than without (I do both).”

Two of the teachers responding to the survey spoke of student interest and pride in digital media projects. Respondent 7 stated students seem to like digital media projects more than just writing out information. Respondent 14 said slideshows created excitement about certain books. She further explained the slideshows, “instilled pride in the students who saw their slides being projected in the library, and modeled reading as a behavior that the Eighth Grade students participated in, for the sake of younger grades in the Middle School.” Respondent 14 also noted, “The personal finance and the Outsiders scavenger hunt were both enjoyable projects for the students.”

Two of the teachers who assigned filmmaking projects indicated students were more engaged and had a better grasp of classroom concepts. Respondent 20 said, “Using digital media turns tasks into art projects. It gives students the opportunity to create.” He went on to say, “Because digital media allows students to express themselves and create, students are more
invested in their work. Because students are more invested in their work, students are more engaged in the content.”

Respondent 15 noted students seemed to know the material better than other students because the filmmaking students had to write out a script and then perform the script.

Three teachers mentioned active participation or student interest in the digital media projects. Respondent 13 simply stated, “They participated more actively.” Respondent 16 elaborated further that digital media projects were one of several options and that only students with an interest in this method of showing their understanding participated. Respondent 18 agreed that students seemed more interested in producing a digital media project for class. She further explained presenting their novel to class with a digital media project seemed to make them more comfortable.

The six remaining teacher responses did not seem to fit into any single category of classification. Respondent 12 noted, “The students seemed nervous at first, and then enjoyed the opportunity to see and hear themselves.” Respondent 1 said, “Students seem to be more engaged in the project when compared to a similar activity that involved paper/pencil.” Respondent 27 explained, “They seem to be more engaged than from a normal lecture class. They get to research & discover on their own.” Respondent 6 had a short response and simply stated, “They did more research.” Respondent 26 said, “They share the presentation as a team and work together to complete requirements provided on a rubric.” And finally, Respondent 5 recalled, “Students got more out of that chapter than any other chapter in the book because they had to look for important details. They also had to know the information so that they could put it in words that children would understand.”
Additional benefits of student-created digital media projects

To determine if the researcher had missed obvious additional benefits associated with student-created digital media projects, he asked teachers to identify benefits other than student engagement and higher order thinking skills.

Four teachers talked about sharing among peers as a benefit to digital media projects. Respondent 24 said, “Students feel proud of their creations and want to share.” Respondent 13 said, “They are able to bring a peer perspective to the topic so that others may understand it the same way.” Respondent 12 said, “Students were also willing to share their performances with peers.” Respondent 5 agreed stating, “The addition of collaboration with their peers is an added benefit.”

Three teachers talked about 21st Century skills or technology as benefits associated with digital media projects. Respondent 1 posited, “I feel it helps students master 21st-century skills that can carry over into the workplace.” Respondent 4 said, “Many students already use technology for entertainment, but I feel it is very beneficial to teach them to use it for work and efficiency. Finally, Respondent 6 explained digital media projects give students the opportunity to learn how to use technology.

Three teachers could not identify additional benefits and gave the following responses: Respondent 20, “Not that I can think of.” Respondent 8, No answer; Respondent 27, No answer.

Two respondents were able to identify benefits for the teachers themselves who assign digital media projects. Respondent 29 stated, “For teachers, we do not have to take home (or store) poster boards and projects in our rooms. The ability to grade digital projects anytime
anywhere is wonderful.” Respondent 9 noted, “I can easily spot areas where misunderstanding has occurred, and also other students can ask questions of the ones presenting which requires presenters to have a higher understanding of the material.”

Two teachers seemed to think digital media projects were of great benefit to students in special education. Respondent 5 stated, “Yes…especially for the SPED student who is visual. These students may or may not be very good at things such as writing…but they are more than willing to use the computer to get their work done.” Respondent 14 seemed to agree with this line of thinking by stating, “For those students who have IEPs, typing is often a required modification, and digital presentations allow those students to have an equal footing with the other students in the class. For some students, there is a distinct advantage of using Google Suite because they can then work on projects at home to refine and revise their work. Unfortunately, for some students without access at home using Google Suite can also be a disadvantage, so those students have been allowed extra work time during Related Arts classes.”

Two teachers mention being creative or using imagination as a benefit. Specifically, Respondent 7 said, “This allows the student to show their understanding of the material by being more creative.” Respondent 16 noted, “(A digital media project) allows students to be their own person and use their imagination.”

The remaining five responses did not seem to fit into any particular category. Respondent 3 said, “They take more pride in the digital projects.” She further explained students will go the extra mile to make digital media projects cool. Respondent 21 said, “They seem to enjoy it more than typical group work or class work.” Respondent 18 observed, “Speaking skills improve.” Respondent 17 said, “It expands their knowledge of the topic.” And
finally, Respondent 15 stated, “Some students do not test well, and this allows them to show what they know without test anxiety.”

**Potential problems with digital media projects**

When asked to identify potential problems with asking students to produce a digital media product, three teachers mentioned access at home. Digital media projects can be time-consuming and many times require students to work on them at home. Respondent 4 noted she believes unequal access between the socioeconomic groups would be a problem. Respondent 9 also mentioned unequal access but offered a possible solution. She said, “When students do not have home access to what they need to create the digital product, they need extra time in class to create it.” Respondent 29 also agreed and mentioned access to Wi-Fi or internet connectivity in the home along with computer issues.

While it is a problem that some students don’t have internet access at home, Respondent 5 identified a problem with students who do have internet access at home. She observed, “If done at home, you don’t know if parents have completed the assignment.”

Although the school in the study provided access to computer labs and Chromebook carts during the school day, Respondent 18 noted it was still possible for teachers not to have access on certain days. The school in question assigned a Chromebook cart to each team which consisted of four classes. There were four Chromebook carts available in the library for checkout as well as an iPad cart. There was a computer lab for each grade level as well as a computer lab in the library. Respondent 24 also noted a school system limitation in that search results are sometimes blocked due to internet filtering. She also noted, “Time needed varies among students’ abilities and backgrounds.”
Three other teachers mentioned the need for supervision of students using digital media projects. Respondent 20 also mentioned supervision and stated, “Technology can be a great tool to aid in the education process. It can also be a distraction. You must make sure that students are using the technology as a tool, not a toy”. This same teacher went on to talk about the need to teach some students how to use technology. She noted, “You must also help them understand how to use the technology, so students able to make the software do what they want it to do.”

Respondent 8 seemed to agree with the idea of having to teach some students how to use technology. She noted, “Some students are not skilled on the computer. When you ask them to do a task, you have to scaffold and sometimes teach them every skill they need to know, including how to click or even type.”

Two teachers, Respondents 3 and 27 both used the term “side-tracked” in their responses. Respondent 3 simply stated that students could get to surfing around on the internet and forget what they were looking for in the first place. Respondent 27 had a similar comment and stated, “As a teacher, I have to constantly monitor them, or they will be surfing the net and not working.”

Respondents 13 and 14 both mentioned problems associated with group work in their responses. Respondent 13 said, “If they work in groups, not everyone is able to work on the project simultaneously.” Respondent 14 stated, “With any group project, students will end up putting in unequal amounts of work toward the final product.” Respondent 14 didn’t just mention group work. She went on to mention some of the problems that were previously mentioned. She talked about the access issue as well and stated student who cannot work on the project at home should be given time in class. Another issue Respondent 14 identified involved the ease with which students can share what they have with their fellow students. She stated,
“With Google Suite, the ease of sharing and copying is much higher than with handwritten work, so the teacher must carefully examine the final product for plagiarism.” Respondent 21 seemed to agree with Respondent 14 on the plagiarism issue and spoke about the taking of media videos that belong to someone else.

Respondents 5 and 15 seemed to have the same thought process and spoke about students not turning in good work because of a lack of ability or interest in the project. Specifically, Respondent 5 said, “Sometimes their answers are weak, and they focus on making their presentation look aesthetically pleasing rather than improving content.” Respondent 15 added to this by stating, “Some want to do sloppy work. You need to have specific guidelines for them to follow and a scoring rubric.”

Respondents 16 and 12, both of whom give video assignments, identified problems with assigning video projects. Respondent 16 related there are sometimes problems with being able to hear and understand everything in the video. Respondent 12 observed, “Some students were not comfortable with this process and would redo multiple times, usually due to nerves.”

The remaining four teachers gave responses which did not fit into any of the previously identified categories. Respondent 1 talked about the varied levels of ability in the classroom. He stated, “This requires me to be very active in the classroom when students are working in order to troubleshoot any issues students have. Respondent 6 said, “Students spend more time making things look "pretty" than filling the project with solid information.” Respondent 17 said students are sometimes confused as to how to start. Respondent 7 did not submit an answer to this question.

**Analysis of interview data**

Five teachers were interviewed concerning two issues suggested by responses from the initial survey. While most teachers in the survey indicated digital media projects encourage
higher order thinking skills and improve student engagement, no one in the survey clearly picked one over the other. The five teachers in the interviews were asked to choose one over the other as having a stronger connection to student-created digital media projects. The interviewees had to justify their answer. Another question not addressed by the initial survey surrounded the question of how exactly student-created digital media projects contribute to higher order thinking skills and student engagement.

**Stronger connection to student-created digital media projects**

Concerning the first question on the stronger connection to student-created digital media projects, all five teachers picked student engagement over higher order thinking skills.

Respondent 14 picked student engagement hands down and explained students in the school are very familiar with using Chromebooks to access the Google suite of tools including slides to make presentations for their school work. She stated, “Media projects are definitely well received by students and score quite high for student engagement.”

She went on to explain engagement with digital media projects can be dependent on the school culture. Respondent 14 further explained that she had taught at another school where students did not have ready access to Chromebooks or the Google suite of tools. She said she would never have assigned a digital media project at that school.

She further explained two new students came into her class has year who did not have a background with Chromebooks or the Google suite of tools. She assigned peer tutors to work with these students who were able to bring the newcomers up to speed in no time.

“So student engagement is high because the system is easy for them to learn and use, and they have an artistic/individualized outlet,” said Respondent 14. “An artistically designed slideshow is more fun to make for most students than a formal essay, for instance. They
usually enjoy getting to present their slides to the class, and the class enjoys having a day to view the work of others.”

As to the connection to higher order thinking skills. Respondent 14 said the specifics of the digital media assignment would determine the degree to which students actually had to think to complete the assignment.

“Also, I think that using the Google Suite is quite easy for students, but perhaps too easy, she explained. “It is incredibly easy for students to copy from others and avoid the thinking altogether. The challenge for teachers is to assign a project that must, by its nature, be specific enough that students must do original work.”

Respondent 14 posited the connection between high-order thinking and digital media projects is very much a variable, while student engagement always seems to be high.

She concluded, “Of course, anything overdone, including digital media projects, could become a boring turn-off.”

Respondent 18 emphatically stated student engagement has a stronger connection to student-created digital media projects. She explained, “When students are excited about a project, there is a good chance they will continue to do research on their own.”

She went on to relate how she gave her students a project to complete using Ancestry.com. She noted, “They did a slide presentation to show the results of their research. Students and even parents told me how the research continued well beyond the project.”

While respondent 18 picked student engagement over higher order thinking skills as having the stronger connection, she wanted to make it clear she still feels there is also a connection to higher order thinking skills. She further related that the interest in the genealogy assignment leads to higher order thinking skills. She explained that if she were forced to choose
between the two benefits of student engagement and higher order thinking skills, she would select student engagement. However, picking one as having a stronger connection does not negate the influence of the other. She noted, “Two birds with one stone.”

Summing up her comments on the genealogy assignment, Respondent 18 stated, “Students watching the presentations, paid attention and were genuinely interested in what they were watching.”

Respondent 15 reluctantly picked student engagement as having the stronger connection. He noted, “Student engagement is really big with this type of work.” He went on to explain that digital media projects seem to spark the interest of his students more than traditional assignments. Like the other teachers interviewed, Respondent 15 did not want to turn his back completely on higher order thinking skills. He quickly added if student-created digital media projects are properly set up and managed, students will also be encouraged to use higher order thinking skills. He further explained, “(Digital media projects) keep the student involved and does not hurt the higher order thinking skills. It seems to keep all students involved as the class will really pay attention to the videos students make.”

While clearly stating at the outset that digital media projects have both connections, Respondent 1 picked student engagement over higher order thinking skills.

“I would have to say that I used them initially to promote student engagement,” He noted. “I find that as educators, we are constantly trying to keep up with all of these changes in technology as well as prepare students for 21st-century careers.”

He further noted students are much more engaged with digital media projects than they are with standard textbook/worksheet style lessons. Respondent 1 noted there are other benefits
associated with student-created digital media projects. He concluded, “I am able to teach them additional skills using a word processor, spreadsheet, slideshow, and imaging software.”

Respondent 20 gave the strongest nod of all the interviewees to student engagement over higher order thinking skills. He went on to talk about how pervasive technology has become in the lives of young people both in and outside the classroom. Since students are surrounded by technology and use it so much anyway, he noted it is only natural to try and engage today’s students with the various tools of technology that are available today.

“All students are eager to learn how to use technology,” he noted. “If your curriculum can work in the core content with some technical skill, you’ve got them.”

Specifics of how student-created digital projects deliver the proposed benefits

When pressed as to how digital media projects contribute to higher order thinking skills and student engagement, the teachers gave varied answers.

“I believe that the higher order thinking skills most used in the projects I assign would be evaluation and synthesis,” said Respondent 14. “Since the primary use in my classes has been either Google Doc for essays or slideshow presentations for biography presentations or book recommendations, the students were required to take a large amount of information, select the most important information, and condense that information into a concise format.”

Respondent 14 went on to say she assigned slideshows as part of a three-minute speech assignment. She felt evaluation and synthesis were used most by her students as they had to choose the best information to fit in the allotted three minutes.

As far as student engagement is concerned, Respondent 14 said, “The students sometimes worked collaboratively which they enjoy, and received peer feedback on their work. Plus, as I mentioned before there is an artistic/creative element that most students find satisfying.”
Respondent 18 observed that today’s students have grown up in the digital age and that they find "old fashioned" research boring and tedious. She went on to say, “The great thing about search engines like Google, is that it leads to more and different information. This can raise questions that need more research which leads to higher order thinking and high interest.” Respondent 18 explained that when students create and present a digital presentation of the results, it captures the attention of their peers who watch the final product with great interest,

“The movement, colors, and music keep their interest,” she concluded. “It's what they are used to now.”

Respondent 1 said when students create digital projects, they are going beyond “drill and kill.” He went on to explain using that when students use their knowledge and understanding of a topic, the learner is creating, synthesizing and even transforming the information in a digital media project.

“I recall a project that I assigned once where students were tasked with researching the climate of up to three coastal cities and three inland cities on the same line of latitude,” he related. “They had to note the highs and lows of the winter and summer months and draw conclusions based on their data.”

For that assignment, the state standard was for students to understand that the ocean causes the area’s climate to be milder and have more precipitation than that of corresponding inland cities.

“Rather than have a lecture or present data that I found myself, the students had to research and draw those conclusions on their own (with some assistance from me) through a multimedia presentation,” said Respondent 1. “The students were engaged, used higher order thinking skills, and had more ownership in their learning.”
Respondent 20 emphasized there is more going on with the student than just the use of technology.

“Students are creating something,” said Respondent 20. “They know their creation will be shared with others. In this way, you are teaching the content material, technology skills, and you are allowing your students to express themselves through the creation of art.”

Respondent 20 characterized student-created digital projects as powerful lessons and powerful learning experiences for students. “The students are engaged because they are getting to explore, choose, and create,” Respondent 20 stated. “Research tells us that these are all necessary elements of effective instruction.”

**Analysis of focus group data**

To establish the validity of the study and create triangulation, an asynchronous online discussion forum was set up for those teachers willing to serve in the focus group (Lim, Cheung, & Hew, 2011) This has become an accepted practice in social research which allows participants to respond to researcher questions as well as to other participants whenever and wherever they chose through virtual focus groups (Murray, 1997). Focus group members were given access to eight key statements concerning the research as well as a rough draft of Chapter Four. They could also click on another teacher’s comment and add to the discussion that way as well. Focus group members were encouraged to disagree with the statements as well as anything in the draft if they thought the researcher had misinterpreted the data.

The eight statements follow:
Statement 1:

Of the two proposed benefits of student-created digital media projects -- higher order thinking skills and student engagement -- there seems to be a stronger connection to the latter.

A majority of the educators in the survey and teacher interviews made it clear they believe there is a connection between both proposed benefits. All four members of the focus group took it a step further and agreed with the statement that there is a stronger connection to student engagement. Although Respondent 15 agreed with the statement, he clarified by stating, “I do believe that there is a connection to both. It (digital media projects) makes the student plan out their presentation.” Respondent 1 agreed with the statement and added, “I believe over the coming years that some of this technology may lose its novelty which will make it harder to be engaging.” Respondents 14 and 18 simply agreed with the statement. The respondents recalled creation is at the apex of Bloom’s Pyramid. They hypothesized if the assignment is merely copying and pasting, there would not be any higher order thinking benefit because the student is not creating something.

Statement 2:

Most teachers who do not assign digital media projects have at some point themselves taken a class where they produced a digital media project.

All four members of the focus group stated they believed this to be the case and noted it would be difficult to get through just about any program of study without having to produce at least one digital media project. In the original survey, the teachers who did not assign digital media projects in their own classes stated they enjoyed the classes they took which required them to produce digital media projects.
Statement 3:

Google slides or PowerPoints were by far the most used digital media project. The second most used digital media project was the creation of videos.

All members of the focus group agreed with this statement as well. Respondent 1 added, “Slideshows seem to fit a lot of different types of assignments and are fairly easy to teach/learn.” Respondent 15 also agreed and noted, “Video creation is what I would push for because of the planning and editing. It forces the students to really think.” Respondents 14 and 18 simply agreed with the statement.

Statement 4:

Creation is the number one reason teachers cite for why student-created digital media projects promote higher order thinking skills.

Respondent 14 stated, “Here I would use the word creativity instead of creation, but I agree with the concept. Perhaps you are working off a list of higher order thinking skill words and want to be consistent by using the word creation?” Respondent 1 agreed with the statement and added. “However, simply "creating" digital media does not necessarily mean that that thinking skill is being met. If the student is simply transferring information from paper to digital, they have not created anything involving the standard.” Respondent 15 noted his complete agreement with the statement and stated, “Creation fosters higher order thinking skills.” Respondent 18 agreed with the statement.

Statement 5:

Students who are engaged with digital media projects seem to learn the material better than students given a traditional assignment.
Focus group members did not wholeheartedly accept this statement. Respondent 18 noted she supported the statement to a certain extent, but not completely. Respondent 15 said, “Agree to a point. Not all students learn the same way.” He went on to say, “Visual learners seem to perform better, but my introverted students may not.” Respondent 1 said, “I agree with this if the assignment is causing the students to hit those higher order thinking skills.” Respondent 14 admitted, “Here I may be a minority view, but I believe students can learn equally with digital or traditional (media).” She added, “What I believe is important is that a variety of formats are used to avoid classroom burnout.”

**Statement 6:**

*Students enjoy getting to see the work of their peers. Also, since they know their peers will see the work, they put more effort into the digital media projects.*

Respondents 1 and 18 simply agreed with the statement. Respondent 15 stated, “Absolutely agree. I used their work as a review for all students before exams. Very successfully.” Respondent 14 stated, “I think there are basically three groups of students. Some are intrinsically motivated and will do their very best in all circumstances. Others are very motivated by grades and pleasing the teacher and again will do their best regardless of format. Finally, many students are not intrinsically motivated or concerned about grades and for those peer pressure will add another level of incentive.”

**Statement 7:**

*The number one obstacle keeping most teachers from assigning more digital media projects is the unequal access at home to computers and the internet.*

Respondent 1 agreed unequal access is a problem, especially when the project cannot be completed during school hours. Respondent s 14 and 18 also agreed with this statement and
discussed the problem of the “haves” and “have-nots.” Respondent 15 didn’t see access as a huge problem and only agreed up to a point. He went on to say, “Students can use their cell phones and most of the time they have friends to help them. This has not proved to be a problem so far.”

**Statement 8:**

The more a teacher assigns student-created digital media projects in the classroom, the more likely they are to assign more advanced assignments such as digital storytelling and video creation. Those who assigned five or more, assigned more sophisticated assignments.

Respondents 14 and 15 simply agreed with the statement. Respondent 1 also agreed and added, “A level of comfort is created when you continually attempt projects like these.” Respondent 18 was most intrigued by this statement and stated, “I think some teachers hesitate to assign videos because they themselves lack the knowledge of how to create them with music and interesting graphics. As you mentioned above, many students don't have access to a computer at home and that hinders a sophisticated assignment also.”
CHAPTER FIVE

FINDINGS, IMPLICATIONS, AND RECOMMENDATIONS

The more a teacher assigns student-created digital media projects in the classroom, the more likely they are to assign more advanced assignments such as digital storytelling and video creation. Those teachers who assigned five or more digital media projects per year, typically assigned more sophisticated tasks.

Summary of the Study

Surveyed teachers believed there was an obvious two-fold benefit when they assigned digital media projects to their students. Those benefits included higher order thinking skills and student engagement. The top two categories of digital media assignments were slideshows and video creation. The surveyed teachers believed there was a stronger benefit associated with student engagement as opposed to higher order thinking skills. Concerning the benefit in the area of higher order thinking skills, teachers noted those assignments must be well planned out and carefully crafted for there to be a benefit there.

Because digital media projects require the student to create something new, a majority of teachers pointed to creation as the primary benefit to higher order thinking skills. Teachers also mentioned the higher order thinking skills of evaluation and analyzing as benefits. While there are obvious benefits associated with digital media projects, the surveyed teachers made it clear educators should not completely abandon traditional teaching methods and go completely digital.
The research also found a social component associated with student-created digital media projects. It appeared to the educators that students enjoyed getting to see the work of their fellow students. Additionally, teachers felt having an authentic audience beyond the classroom contributed to students spending more time on the projects.

A final issue was identified in the research. Educators noted the lack of equal access to computers and the internet at home would be a problem if students were expected to work on the projects outside of class. On a related note, even those teachers who did not assign digital projects admitted they had taken classes themselves in which digital media projects were assigned. This seems to indicate the trend is for teachers to assign more and not less digital media projects.

**Research questions**

1. Does integrating digital media creation into the curriculum actually encourage higher order thinking skills?
2. Does integrating digital media creation into the curriculum increase student engagement?

**Findings**

Of the two proposed benefits of student-created digital media projects -- higher order thinking skills and student engagement -- there seems to be a stronger connection to the latter. However, a majority of the educators in the survey and teacher interviews made it clear they believe there is a connection between both proposed benefits.

Creation of something new seems to be the primary benefit to higher order thinking when teachers assign digital media projects. While creation is at the top of Bloom’s revised
taxonomy, the next two levels from the top are evaluation and analyzing. There were respondents who also mentioned these levels as well.

While the teachers who did not assign digital media projects could not see a way to integrate the practice into their own teaching, they admitted that they had taken classes where this was a requirement. This seems to show that digital media projects are gaining in popularity as one of the many tools in the arsenal of a well-rounded teacher.

There was not a lot of variety in the digital assignments. Primarily, slideshows and videos were the digital media projects of choice.

Students who are engaged with digital media projects seem to learn the material really well. However, the teachers in the focus group did not believe digital media projects were better than traditional assignments or that digital assignments should replace traditional assignments.

As far as the social aspects of students creating digital media projects, teachers were in agreement that students enjoy getting to see the work of their peers. Because students know their work will be seen by their peers, and perhaps a larger audience depending on teacher preference, they spent extra time preparing the projects for an authentic audience.

Student access to technology was seen as the number one obstacle keeping teachers from assigning more digital media projects. Some students have home access to computers, tablets, and smartphones at home as well as broadband internet on Wi-Fi.

It is a universal truth that the more someone engages in an activity, the better they get at it. This was also found to be the case with digital media projects. The more teachers persist in giving a digital assignment, the better they get at it. The assignments become more sophisticated and challenging.
Recommendations for future studies

Since this study examined teacher-perceived benefits of student-created digital media projects, future studies should directly study the impact on the students themselves. And while this study broadly examined all kinds of digital media projects, a future study could look at only filmmaking and examine the social aspects of students working together to create a film.
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Appendices
Appendix A

District and Principal Research Approval
Carson Newman University Institutional Review Board  
1646 Russell Ave.  
Jefferson City, TN. 37760

May 23, 2018

Dear Carson Newman IRB:

RE: Approval of Greg Rains to conduct action research at Coffee County Middle School on student-centered digital media projects.

On behalf of Coffee County Middle School, I am writing to grant permission for Greg Rains, a graduate student at Carson Newman, to conduct his research titled, Impact of Student-Centered Digital Media Projects on Higher-Order Thinking Skills and Student Engagement. I understand that Greg Rains will be looking at data from teacher surveys, teacher interviews and teacher focus groups at Coffee County Middle School and determining the results of the intervention. The data used is a part of the regular education program and the participants will remain anonymous.

I have received email confirmation from Dr. Gonzales that the research has received IRB approval.

We are happy to participate in this study and contribute to this research.

Sincerely,

Kim Aaron
Appendix B

Google form survey
Impact of student-created digital media projects on engagement and higher order thinking skills in the middle school classroom.

Thank you so much for taking this survey. I am researching student-created digital media projects. Please don't think that you must have used this strategy to respond. If you have not used this strategy, your feedback is just as important, maybe even more so, than those who have employed digital media projects in the classroom. While I am collecting email addresses below in case I need clarification on a response, all responses and accumulated data will be reported anonymously in my paper.

* Required

Email address *

Student-created digital media projects include such things as filmmaking, digital storytelling, making a video, vlogging, podcasting, recording a newscast, creating a slideshow, etc. Have you at any time asked students to show their learning by creating a digital media product?

YES

NO

This section for teachers who HAVE asked students to create a digital media product to show their understanding.

How often do you have your students create a digital media product?

Once or twice a year

Three to four times a year

Five times a year or more
Can you describe the specific assignments you have given students where they are expected to create a digital media project?

Your answer _______________________________________________________

What impact on student engagement have you witnessed when you gave students a digital media project?

Your answer _______________________________________________________

What impact has digital media projects had on the higher order thinking skills of your students?

Your answer _______________________________________________________

Are there other benefits associated with giving students an opportunity to show their understanding of classroom concepts through digital projects?

Your answer _______________________________________________________

What are some of the potential problems you have encountered when asking students to produce a digital media product?

Your answer _______________________________________________________

Should I have further questions or need to clarify a response, what would be the best way to contact you? Check all that apply.

email
text message
cell phone

Other:

This section for teachers who have NOT used student-created digital media projects in their classroom.
While you have not used student-created digital media projects in your own instruction, have you ever taken a course that required you to produce a digital media product? *

YES

NO

If you answered yes to the previous question, did you enjoy creating the project for that class?

YES

NO

What are some of the reasons you have decided not to use digital media projects in your classroom? *

Your answer ________________________________________________________________

Should I have further questions, what would be the best way to contact you? Check all that apply.

email

text message

cell phone

Other: