2012-06-13

Media Meets Science: The Experience of a Media Teacher and Science Teacher as They Implement Media Literacy in a Science Classroom

Matthew Jay Brown
Brigham Young University - Provo

Follow this and additional works at: https://scholarsarchive.byu.edu/etd

Part of the Film and Media Studies Commons, and the Theatre and Performance Studies Commons

BYU ScholarsArchive Citation
Brown, Matthew Jay, "Media Meets Science: The Experience of a Media Teacher and Science Teacher as They Implement Media Literacy in a Science Classroom" (2012). All Theses and Dissertations. 3263.
https://scholarsarchive.byu.edu/etd/3263

This Thesis is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in All Theses and Dissertations by an authorized administrator of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.
Media Meets Science: The Experience of a Media Teacher and Science Teacher as They Implement Media Literacy in a Science Classroom

Matthew Jay Brown

A thesis submitted to the faculty of Brigham Young University in partial fulfillment of the requirements for the degree of

Master of Arts

Amy P. Jensen, Chair
Sharon Swenson
Darl Larsen

Department of Theatre and Media Arts
Brigham Young University
June 2012

Copyright © 2012 Matthew J. Brown
All Rights Reserved
ABSTRACT

Media Meets Science: The Experience of a Media Teacher and Science Teacher as They Implement Media Literacy in a Science Classroom

Matthew Jay Brown
Department of Theatre and Media Arts, BYU
Master of Arts

This qualitative action research study looked at my collaboration with a science teacher as we combined a Television Production class with an Advanced Placement Environmental Science class. This cross-curricular case study explored the implementation of the principles of media literacy, defined by the National Association for Media Literacy Education, into the science classroom where media literacy has traditionally been a non-factor. The impact of media and technology on everyone’s daily lives is making it necessary for us to become media literate. The use of media literacy tools and strategies in a combined media production class and an AP science class created opportunities to explore cross-curricular understandings of media literacy education that would not have existed otherwise.

Keywords: media literacy, advanced placement environmental science, Matthew Jay Brown, Robert Steele, cross-curricular, science classroom, television productions, multiliteracies
ACKNOWLEDGEMENTS

As I reflect upon all those who are connected to this thesis I am amazed at the web of support that has developed over time. I would like to thank my committee and others at Brigham Young University who have challenged me and then waited and waited for me to respond, thank you for your patience.

To my friends and family who heard me say a thousand times, “I can’t, I have to work on my thesis”, thank you.

Finally to my wife and children who despite knowing me fully expect me to succeed at everything I do. I finished because of you, and I couldn’t have done any of this without you.
<table>
<thead>
<tr>
<th>CHAPTER ONE: INTRODUCTION</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>The Problem</td>
<td>4</td>
</tr>
<tr>
<td>Media Literacy Education</td>
<td>6</td>
</tr>
<tr>
<td>Literacy</td>
<td>7</td>
</tr>
<tr>
<td>Role of Media Literacy Education</td>
<td>9</td>
</tr>
<tr>
<td>Student Learning</td>
<td>11</td>
</tr>
<tr>
<td>Media Exposure</td>
<td>12</td>
</tr>
<tr>
<td>The Gap Between In-school and Out-of-school Literacies</td>
<td>14</td>
</tr>
<tr>
<td>Pop Culture</td>
<td>15</td>
</tr>
<tr>
<td>Advantages of Bridging the Gap</td>
<td>16</td>
</tr>
<tr>
<td>Changes in Pedagogy</td>
<td>18</td>
</tr>
<tr>
<td>How to Use Technology</td>
<td>20</td>
</tr>
<tr>
<td>Basic Principles</td>
<td>21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER TWO: THE PROJECT</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Aims</td>
<td>25</td>
</tr>
<tr>
<td>The goal of the study</td>
<td>25</td>
</tr>
<tr>
<td>The project</td>
<td>26</td>
</tr>
<tr>
<td>Contextual information</td>
<td>27</td>
</tr>
<tr>
<td>Why APES?</td>
<td>29</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER THREE: RESULTS AND EXPLANATIONS OF THE DATA</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Data</td>
<td>36</td>
</tr>
<tr>
<td>Logistics</td>
<td>39</td>
</tr>
<tr>
<td>Before the field trip</td>
<td>39</td>
</tr>
<tr>
<td>Preparing for the trip</td>
<td>40</td>
</tr>
<tr>
<td>Preparing the students</td>
<td>41</td>
</tr>
<tr>
<td>The field trip</td>
<td>43</td>
</tr>
<tr>
<td>After the trip</td>
<td>43</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>44</td>
</tr>
</tbody>
</table>
APPENDIX

Moving beyond a tool-oriented focus that conflates having access to media and technology with the skillful use of it...........................................44
Addressing risks associated with media and digital technology.................................................................47
Expanding the concept of literacy.................................................................50
Strengthening people’s capacity to assess message credibility and quality.................................................................51
Bringing news and current events into K–12 education...........................................54

Student Feedback.................................................................................................................................55
Recommendations.................................................................................................................................58

CHAPTER FOUR: DISCUSSION.......................................................................................................................60

Which Core Principles Best Apply to APES Curriculum?...........................................61
What Are the Benefits and Drawbacks of Collaboration?...........................................63
How Can Media Production Be Used in APES Instruction?...........................................64
Improving Practice.................................................................................................................................65

Going Forward from Here: Best Practices.....................................................................................................65
Moving beyond a tool-oriented focus...........................................67
Addressing risks associated with media...........................................67
Expanding the concept of literacy...........................................68
Strengthening people’s capacity to assess...........................................68
Bringing news and current events into K–12 education...........................................69

Conclusion.........................................................................................................................................................71

BIBLIOGRAPHY...............................................................................................................................................72

APPENDIX A........................................................................................................................................................77

The New London Group Pedagogical Structure.................................................................77

APPENDIX B........................................................................................................................................................78

National Association for Media Literacy Education (NAMLE)...........................................78
Core Principles of Media Literacy Education.................................................................78

APPENDIX C.........................................................................................................................................................79

Post-Activity Survey............................................................................................................................................79

APPENDIX D.........................................................................................................................................................80

Advanced Placement Environmental Science Lesson Plan...........................................80

APPENDIX E........................................................................................................................................................83

TV/Video Productions Lesson Plan...............................................................................83

APPENDIX F........................................................................................................................................................84

Dissolved Oxygen.............................................................................................................................................84

APPENDIX G........................................................................................................................................................86

Nitrate Levels.....................................................................................................................................................86

APPENDIX H........................................................................................................................................................89

The pH Scale.....................................................................................................................................................89

pH Scale...........................................................................................................................................................90
MEDIA MEETS SCIENCE

APPENDIX I........................................................................................................................................... 92

Stream Flow............................................................................................................................................... 92

APPENDIX J............................................................................................................................................... 94

Turbidity.................................................................................................................................................. 94
CHAPTER ONE: INTRODUCTION

Introduction

I was hired to teach Multimedia and Television Broadcasting at an Intermountain West suburban high school. I had no formal training as a teacher, but I had just come from the television industry working as a freelance cameraman. Before that I had worked for the local NBC affiliate. I was confident in my abilities in professional production and assumed that I knew what it would take to be a teacher. On my first day I was a little nervous about meeting the students, but not about teaching. I showed my portfolio and told stories from my professional experiences. I went home thinking that this was going to be fun and, because I had gotten along with my students, I thought it would be easy. I was wrong. By the fourth day I had run out of content to show and I would soon run out of stories to tell. I needed to do something different.

So I did what I knew: I created a business like environment and treated my students like employees. I immersed them in production. This was the type of environment I was used to. I expected my students to just learn their job and, after some practice, things would get moving and our school would have a regular production lab that produced high quality content and trained competent students. It didn’t go as I planned. I was disappointed in the students’ slow progress and in the quality of the product. Even when all the students worked together with no technical problems, the final product was far below my expectations. I was missing something in my classroom.

After eight years of teaching I have seen general improvements in technology and my own pedagogy. The changes that have taken place resulted from many factors ranging from my actions in the classroom to the cost and availability of communication technologies like cameras,
MEDIA MEETS SCIENCE

cell phones, and computers. Students and their parents have access to and are using technologies outside of school and then want to learn about them in-school. This increased attention to my subject by students and their parents has also increased my desire to improve my teaching and curriculum.

Today, when I start with a new group of students, I explain to them that the heart of my media classes is making emotional connections with their audience through storytelling. The process of learning how to do this and understanding how this is done professionally teaches critical thinking and creative problem solving skills. This is not what I always thought my class should be. Through self-reflection and assessment, I began to realize where I came up short as a teacher. When I started teaching I was not there to help students learn—I was there to make students perform. I expected students to teach themselves and this led to students focusing on a software application or knowing what button to push. This method left my students with knowledge that expired when the next version of the software was released or with frightened, panicked students who couldn’t problem solve when the button they pushed didn’t do what they wanted. That first year I discovered that I was not teaching students. I was impressing students. My problems as a teacher began with my educational objectives and pedagogy. I began looking for better ways to teach.

In the beginning, I made assumptions about how my students consumed media. I thought they watched TV the same way I watched TV; they don’t. I assumed the students would identify motives behind production or reasoning behind different techniques; they can’t. I had learned to do this in my professional work but had not incorporated that practice in the classroom. My students didn’t think about media—they consumed media, and that was it. My students had access to media outside of the classroom but did not encounter media in academic settings. My
students did not have the skills to analyze media and its production. In class I compared the students to the rats in *Ratatouille*. The rats categorized food in only two ways: edible or deadly. When one rat became critical of what he ate it started him on a journey of discovery (Bird & Capobianco, 2007). My students categorized media in two ways: entertaining or boring. When it came to creating media they struggled to express new ideas or mimic established ideas through media. When I asked why they watch or liked certain things they told me it was because it was funny or cool, but they didn’t reflect upon their media experience beyond that. The students had never studied or reflected upon the media. When media was used in a classroom setting, the students rated its value based on how entertaining it was. I could see that I needed to make some changes in how media was used in my pedagogy.

At that time, my classroom was focused on media production. The state standards described the purpose of the class as exposing students to camera, audio, and lighting systems for the purpose of video productions (Utah State Office of Education [USOE], 2009). This was easily taught and measured, but this technical knowledge quickly became outdated as technology advanced. I was looking for the skills that would have use in other classes, at home, or in whatever students choose to do in the future. In education, the term for knowledge that can be used across many disciplines is called leverage (Ainsworth & Viegut, 2006). The critical thinking and problem solving skills a student gains in my class studying media can be useful in many other settings. I wanted to teach the skills that had leverage across the curriculum. I found help with this when I discovered and applied media literacy education concepts.

Renee Hobbs (2010), a proponent of media literacy, defines media literacy as, “a constellation of life skills that are necessary for full participation in our media-saturated, information-rich society” (p. vii). These life skills include the ability to:
MEDIA MEETS SCIENCE

- Access and share information.
- Analyze and identify the author, purpose, and credibility of a message.
- Create media products using elements like language, images, and sound.
- Reflect upon the messages and purposes of your own mediated messages.
- Actively share with your family, workplace, and community (Hobbs, 2010).

Media literacy builds upon the foundation of traditional literacy but expands the use of “text” to include multiple forms of communication. Individuals who are media literate can access, analyze, create, reflect, and act (Hobbs, 2010). I wanted my students to become active, not passive, consumers of media. I also wanted them to be active producers of media, and this required planning and reflective skills as well as mastering the techniques. I began to make these changes to my practice. Hobbs (2010) said of media literacy, “people need the ability to access, analyze and engage in critical thinking about the array of messages they receive and send in order to make informed decisions about the everyday issues they face regarding health, work, politics and leisure” (p. vii). Introducing media literacy in my production classes has helped me teach the skills that are important to the students in any other classroom or social situation they are in. Teaching students to question the media they consume has helped my students create better media products, like videos, posters, graphics, and websites, because they analyze the purpose of structure or technique and then incorporate that into their own productions. Media literacy education is important and needs to be incorporated into more classrooms than just the media production classroom.

The Problem

This is where I see a problem. Media literacy is not being taught across the curriculum, or
when teachers include media examples, they are not including key elements of media literacy, like inquiry, into the media itself when reflecting upon their media experience or creating media products (Eeden, 2008). Media literacy needs to be integrated across the curriculum. What I see happening is that pictures, video, or sound are used to enhance a lesson, using the media as a teaching tool, but without critical inquiry into the media itself. When media is used in a classroom, students begin to take everything they hear in that media example as truth, because it was used in school to teach them a lesson. I always think about the students in science class watching a documentary and just passively listening to the expository voice tell them the “truth”.

I walked into a classroom in my school district one day and looked at a pamphlet that was available to students. The headline of the pamphlet questioned the issue of “global warming.” Knowing that to be a polarizing topic I picked up the pamphlet and quickly browsed the contents and noticed that even with several different viewpoints expressed there was a definite underlying bias. The information concluded that global warming was a naturally occurring event. Looking at the back of the pamphlet, the small print revealed the publishers of the pamphlet were petroleum producers. The pamphlet was designed to deliver information quickly with a headline that would grab anyone who glanced at it. I assume the pamphlet was free for the schools and it may have even come with some gift for the school or teacher. The teacher might personally agree with what was in the pamphlet or possibly financially benefit from the pamphlet in some way, but most likely, the teacher never questioned the information. It probably showed up in the mail and the teacher just set it out for students to read. I am not arguing that the information in the pamphlet was “right” or “wrong.” I do question the students’ and the teacher’s ability to recognize the bias behind the information. Students and teachers need the skills to read, understand, and be critical of media. Media literacy needs to be taught across the curriculum.
MEDIA MEETS SCIENCE

These skills can’t be taught in just one class if they are to have long-lasting effects.

My classroom alone cannot serve the entire school population. Because of this I have become passionate about expanding media literacy beyond my classroom and testing the leverage of media literacy across the curriculum. I was interested in exploring possible best practice uses of media literacy education in a science classroom. There are several reasons I chose a science classroom to explore media literacy. First, it is a core subject and all students are required to take some form of science class before they graduate from the district I teach in (Alpine School District [ASD], 2011). Second, science classes have many visuals that might make it easier to incorporate media analyses and production. Third, logistically it was simpler to work with this particular class because it was being taught at the same time that I was teaching a media production class.

Media Literacy Education

Media literacy education has been promoted and explored for several decades in the United States, but it has not gained as much popularity or prestige in secondary educational realms in the U.S. as it has in Great Britain, Canada, and Australia (Tyner, 1998; Buckingham, 2003b & 2007; Kist, 2005; Kellner & Share, 2005; Hobbs, 1998). However, in the last decade, media literacy has been gaining ground in the US and is becoming more recognized and implemented in curriculum (Tyner, 1998; Hobbs, 2005). Hobbs talks with enthusiasm about how media literacy education is becoming more established, and how more K-12 schools are adopting media literacy education principles in the classroom and in the curriculum. Even with growing interest and visibility, there are still teachers and administrators who hesitate to adopt media literacy as a component of their instruction because they aren’t sure how to manage it or are
nervous about putting the responsibility for exploration and explanation on the student (Hobbs, 2005). I can understand this. Teaching media literacy across the curriculum will require some changes, and that change begins with literacy.

**Literacy**

Media literacy does not replace the educational foundation of traditional literacy but rather it builds upon it. “Literacy involves gaining the skills and knowledge to read, interpret, and produce certain types of texts and artifacts and to gain the intellectual tools and capacities to fully participate in one’s culture and society” (Kellner & Share, 2005). The foundation of media literacy is literacy. At the heart of education is learning how to read and write in the appropriate social and cultural context. Traditional text-based literacy is not wrong, it’s too narrow. According to the Center for Media Literacy (Center for Media Literacy [CML], 2008), “The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn” (p. 7). This statement reflects the cultural shifts happening outside of school. Cultural shifts should translate into pedagogical shifts in the classroom (Williams, 2006). The amount of information available and being created today is astounding. It is becoming more important to understand how to find and analyze information than it is to know all the information. We need to expand what counts as literacy in school to include multiliteracies through media literacy education.

According to Bloom (2008), “school literacy practices do not necessarily constitute an entire set of literacy practices within classrooms” (p. 251). By expanding what can be read and written to include media products, a teacher can connect classroom learning to social interactions of the students, deepening classroom content. According to Gee (2005), literacy is interacting
through language, not just reading and writing; it can include oral and visual expression. Mary Kalantzis and Bill Cope advocate media literacy education through multiliteracies. Cope and Kalantzis (2000) outline the need to restructure our education, not by replacing traditional literacy, but restructure traditional literacy to include multiliteracies:

Of all the functions and purposes of education, reading and writing have always been foundational. Literacy is the first major function of formal education both historically in the origins of modern, institutionalized education and in the life history of every child or adult learner as they enter the modern education process (p. 121).

Reading and writing allows a person to communicate within their culture and surroundings. Becoming literate means gaining an understanding of the rules and methods of conveying meaning and maintaining understanding as meaning and context shift and change (Kellner & Share, 2005). A study by the John D. and Catherine T. MacArthur Foundation describes the shift in traditional literacy as an expansion that allows teachers to look at how to use digital media as a text (John D. and Catherine T. MacArthur Foundation, 2010). Today there has been a shift in how we communicate and share our culture. This shift has happened outside the classroom, and unfortunately the learning structure in the classroom has been slow to respond.

Current school structures were originally created as a reflection of the economic and social structures that existed outside of school at the time our school system was created. Cope and Kalantzis (2000) use the term “Fordian” when describing our current school model, where students are on an assembly line, expected to pick up what is needed, as they move through the
system. This model worked effectively in preparing students for the literacies that were required at the time the system was created. This model can be effective today if adjustments are made to update the skills available. Today the Center for Media Literacy describes economic shifts in our culture from an industrial base to an informational base; and this shift requires new literacies (CML, 2008; Gee, 2000; Cope & Kalantzis, 2000). Current classrooms do not reflect the required literacies needed outside of the classroom. In today’s technology and media-saturated culture it seems natural to adjust the traditional meaning of literacy to include media and computer literacies (Kellner & Share, 2005).

David Buckingham (2007) describes a literate individual as someone who has acquired analytical skills and an understanding of how language functions to understand communications. When the tools for communication change, so do the literacies needed to use them. Kellner and Share (2005) claim it is “irresponsible in the face of saturation by the Internet and media culture, to ignore media pedagogies in the classroom” (p. 371). Kellner and Share are not arguing that the traditional text based literacy is irrelevant, but it needs to expand and recognize media as a valid text that can be read and written. Joseph Lo Bianco (2000) calls for a new literacy foundation in school, one that includes multiliteracies through media literacy education.

**Role of Media Literacy Education**

The National Association for Media Literacy Education (2007) says, “The purpose of media literacy education is to help individuals of all ages develop the habits of inquiry and skills of expression that they need to be critical thinkers, effective communicators and active citizens in today’s world” (p. 1). Media literacy can help us be more active consumers in our media saturated culture (Kellner & Share, 2005; Brown, 1998; NAMLE, 2007). When I explain to my
students what we will be doing with media literacy in the classroom, I share with them a personal experience to help create a context.

Several years ago I volunteered to work in an English language learners classroom. I worked with one student who was a native English speaker and could read and talk just like the average person in the school. But this student struggled with comprehension. He could read out loud from a textbook without any problem but could not answer questions on a worksheet about the reading this student just completed. He lacked the ability to read something and connect it to what he was being asked to do on the worksheet. This student was in this lab to help master an important component of literacy: comprehension. Just because he could read a text out loud did not mean he comprehended its message.

I explain to my students that media literacy is very similar. Just because they watch movies or the news, it does not mean they automatically comprehend what they are watching. Comprehension requires the consumer to be active in decoding the language of the media. Elements contained in the images and sound need to be recognized by the audience for the media to communicate the way it was intended to. When the audience does not recognize the elements contained in the media, the audience does not comprehend the intended messages. Which elements a person recognizes depends on their previous knowledge and familiarity with cultural and intertextual references. When a person comprehends a received message, it can have an effect upon the media a person creates. When they get the chance to produce media it often is influenced by what media they have consumed. I watch my students year after year describe what they like about a favorite movie, but when they get a camera in their hands they don’t know what to do or how to start. They don’t connect what they are reading with what they are asked to create; there is a lack of comprehension. If they can’t do it in my class, then they can’t do it in
I explain to students that I approach media with the idea that media is not inherently good or bad or that students are wrong to be so immersed in the media, but rather media can be used to help everyone, including me as the teacher, understand the content that drives our culture. I want students to understand why what they are learning is important so they will seek learning on their own. I desire my students to be active participants in our mediated culture by being both creators and consumers of media.

**Student Learning**

While taking a child development class, I read about metacognition. Metacognition is a person’s awareness of their cognitive processes (McDevitt & Ormrod, 2004). When someone is exposed to a symbol or image that they are not familiar with, they will determine the meaning of that image based on how it is used in relation to their current knowledge and experiences (McDevitt & Ormrod, 2004). Later, if the learner is exposed to the same symbol but in a different context, they have to create a new “file” or memory for future reference. This happens over and over throughout a person’s life (McDevitt & Ormrod, 2004). If the learner doesn’t expect to use that new file or memory in the future, they won’t seek more information about it and the learning stops (McDevitt & Ormrod, 2004). As I read that, I kept hearing the phrase my students use about their math classes: “When will I ever use this?” If the learner sees no application of the available knowledge then why study it? Even though my students were surrounded by media, they didn’t see how media class was important to them and so they didn’t seek to learn on their own. I had to get my students to want to analyze and discuss media. I had to show students how what they learned in my class would be applicable in other subjects. Most teachers I talk with have the same desires. They want their students to take ownership or try
Media meets science

harder in every subject. I considered what was the best strategy for accomplishing these goals for improvement. Teachers need to get students to want to apply the knowledge learned in class to out of class situations. All students need to know how to learn from the media surrounding them. Buckingham (2003) writes about the shifting relationships between media and culture. Media and culture are inseparably connected to education and are impacting literacy in the classroom.

Media Exposure

I don’t have a traditional textbook in my classroom because I don’t need one. My texts are everywhere. They are in the pockets of my students, on every computer, in their car, the grocery store, and plugged into their ears. According to the Kaiser Family Foundation (Kaiser Family Foundation [KFF], 2010), young people today spend an average of seven and a half hours a day with media. This study shows that the more access to media and technology that a person has, the more media they consume. Contemporary youth have the greatest access to TV, radio, music, and the Internet, and these technologies and media make up the majority of what youth consume (KFF, 2010). Informal surveys of my classroom support this data.

Changes in technology and media over that last few decades have brought changes in how we socialize and how we learn. According to the Center for Media Literacy (2008), the advancements in technology and the saturation of the media in our culture have changed how we learn about the world. Gee (2000) also describes a shift in culture because of the amount of information available through the media. People must be fluid in their skills so they can adapt as needed (Gee, 2000). Today, information surrounds us, and the amount of data being generated is more than anyone could ever know. It has become more important to know how to find and analyze information than it is to know all the information (Gee, 2000; John D. and Catherine T.
MacArthur Foundation, 2010). Lessig (2007) talked about the differences between parents and their children. The parents of today’s youth are “read only” (Lessig, 2007). The older generations grew up without computers and the Internet. They went to school and were told what was important. Libraries, knowledge, and information progressed steadily and it was important to consume this knowledge but difficult to add to it or change it. Lessig (2007) describes today’s youth as a “read/write” generation. Technology has made information available and editable. The power to create has moved from the few to the many (Lessig, 2007). Our culture has become a read/write culture.

I see this every year. I watch a movie and think, if only it had ended differently. My students will see the same movie and then make an animation about how it should have ended and then post that on the web and see who else thinks like them. The New London Group defined education as learning that would benefit everyone in preparing them to interact in social and economic life (The New London Group [NLG], 2000). Our in-school education is to prepare us to interact outside of school. Our in-school pedagogy should reflect out-of-school interactions. Teachers across the curriculum have to adjust it to include media literacy to make learning more efficient. The CML calls for a more comprehensive learning mode that includes critical analysis of media, symbols, and images. A new pedagogical framework is needed (CML, 2008; NAMLE, 2007; Buckingham, 2003b, Kist, 2005). Educators must do more than lecture and give guidelines. They need to allow students to explore and produce products and then critically review the process and products. This will prepare students for life outside the classroom (Williams, 2003; CML, 2008; Buckingham, 2003b).
The Gap Between In-school and Out-of-school Literacies

Schultz and Hull (2008) identify literacy as having two different and unique strands, in-school and out-of-school literacies. Out-of-school literacies are usually described as social and culturally based. In-school literacies are most commonly based on traditional text literacies with an academic vocabulary (Schultz & Hull, 2008; Goodman, 2003). We know that students are spending as much time outside of school consuming media as they spend inside school. There is a divide or gap between the two worlds. The out-of-school setting has seen a massive boom of new literacies, while in-school literacies are being narrowed and focused on traditional texts. Young people are not engaging with the in-school literacies (Schultz & Hull, 2008; Street, 2003). Goodman (2003), while organizing inner-city after-school media production workshops, watched his students master outside-of-school literacies through TV, music, and Internet, but they were unprepared when they walked into a school where traditional print literacy dominated (Goodman, 2003).

I see this gap every day in my school. I watch students quickly find information about a topic on the Internet, but they often struggle to make sense of the information to answer a question. However, if there is a new game on the Internet, students quickly learn how to operate the game and engage with it. Gee (2004) has looked at gaming and the effects on learning through gaming. Gee credits modern technology for creating an environment outside school that has become more conducive to learning than inside schools. “Young people today are often exposed outside of school to processes of learning that are deeper and richer than the forms of learning to which they are exposed in schools” (Gee, 2004, p. 107). The students interact with a video game through multiple senses. Games can force students to solve problems, and they
receive immediate feedback from their choices. There needs to be a change in teaching methods if schools are going to compete with the learning environment available to students outside of school (Buckingham 2003b; Goodman, 2003; Street, 2003; Schultz & Hull, 2008; Tyner, 2010). Using media as a text engages students and grabs their attention. Analyzing movie trailers in an English class for elements of foreshadowing and analyzing a Hollywood movie stunt in a film for authenticity in physics class are great ways to engage students in the learning process.

**Pop Culture**

Outside of school, young people are watching, listening, and socializing through media and technology. Brown (1998) said that, “Television is the central socializing process in society” (p. 17). When friends get together they talk about a TV show, movie, or YouTube clip they have seen. They are taking photos and sharing them through social websites. They can upload and respond to each other almost instantly. They are connected constantly with each other and their parents. A young person’s culture and even identity are inseparably connected to media and technology (Williams, 2008). It is possible to connect classroom learning to that cultural identity through media literacy. Limiting what counts as literacy in school also limits when learning can happen. Learning can and does happen everywhere and through any medium. Limiting learning to the classroom with a traditional textbook limits your tools for teaching. Today’s tools for learning are everywhere. Schultz and Hull (2008) said:

> When learning is no longer geographically tied to a desk, the school library, the book, or the teacher who demands ‘all eyes up front,’ then old-style transmission and surveillance pedagogy becomes less stable and less defensible but complementary to the out-of-school pedagogies and practices in households,
Our current system teaches kids that the place to learn is in class, and when they walk out of the classroom their learning stops. Learning that is tied to a desk is not learning that can be easily applied to actions outside the classroom. Media literacy is a way of bringing the outside culture into the classroom without it being used for entertainment purposes.

When a teacher begins teaching media literacy, one important resource is the pop culture students are consuming. Pop culture references in the classroom, like new technology, can be effective when there is a plan on how it will be used to support students in their exploration and not as a substitute for formal teaching (Buckingham, 2003b). Buckingham suggests beginning with cultural references the students are familiar with. This means that before a teacher brings popular culture into the classroom in an attempt to make what students learn in-school relevant to life outside of school, he or she needs to think about how that popular culture media example will be used. Through the process of situated practice and direct instruction students can examine popular culture in the classroom (Buckingham, 2003b).

**Advantages of Bridging the Gap**

I see two advantages to bridging the gap. Engaging students with cultural and social references with which they are familiar with lets students bring their life into the classroom, and allows teachers to put their classroom into the lives of the students. I remember when I was a student in my high school geology class. My teacher explained how a movie in theaters at the time showed a volcanic eruption. My teacher described how the filmmakers made gross errors in portraying the eruption because the main characters in the film were on the mountain, and if they
were killed the story would have ended. But once the characters reached safety the filmmakers did an excellent job portraying a volcanic explosion and pyroclastic flows resulting from the blast. Fourteen years later I can’t watch that film without thinking about the concepts of a volcanic eruption. When that teacher connected the concepts in the class with the cultural reference it had long lasting effects on me. In that class that day I was engaged with that subject. Studying cultural media examples can help bridge the gap. Recognizing that this gap exists means we are recognizing, “students have lives outside of the classroom that may affect how they engage in the literacy practices of the classroom” (Bloom, 2008, p. 253).

Recognizing the gap also means the things students learn in the classroom may affect how they live outside our classroom. Bridging this gap is what will make our class relevant to their lives and create context for learning in our classrooms no matter what the subject (Gee, 2004). Incorporating media literacy across the curriculum through multiliteracies, because communication happens through multiple senses, can help bridge the gap and show students how classroom learning impacts out of class experiences.

Closing the gap will help us better understand the social context for the mediated messages that dominate our culture. It is essential to expand beyond text-only based literacy to include all the different ways we communicate, to expand into multiliteracies. This will impact teaching styles and pedagogy. Multiliteracies incorporate the different mediums of communication and modes of learning into a new more modern pedagogy. This combination accounts for the connection and impact life outside the classroom has on in-class learning. Multiliteracies will impact the classroom and influence the students’ life outside the classroom, where they can learn to be active participants in society.
Changes in Pedagogy

The New London Group (2000) has identified a pedagogical structure based on multiliteracies. The New London Group (2000) argues that current pedagogy should include four teaching elements: (a) situated practice; (b) overt instruction; (c) critical framing and (d) transformed practice (see Appendix A). These elements can be adapted to the individual classroom. Using the camera angles example again I would use overt instruction to teach the camera angles and give them examples of how camera angles are used but have the students determine the meaning. Next I would use critical framing and set some guidelines for a video product they would produce. Students would then outline how they would use different camera angles and show me when someone else used the same angles to create the same meaning. Situated practice would allow students to produce the media product using the camera angles they planned.

Using their media product as my assessment tool I can determine their knowledge of camera angles, and when to use them, and their relationships to meaning. As a class we can reflect upon the product to see if the students produced a product that reflected their intentions. Transformed practice would then be used as a follow-up activity where I would require students to analyze camera angles in a movie they watch in another class or at home. Applying the knowledge gained in my class to another class would teach students how to adapt their knowledge to the situation they are in or to another in-class project. The learning environment needs to be structured so students can take ownership of learning and are supported by teachers, not dictated to by the teacher (CML, 2008). The responsibility for learning will shift from the teacher to the student and parents, but only if the teacher can structure the classroom to support
students in their exploration (Brown, 1998). These different pedagogical approaches can be used separately or together as a way of incorporating new media. I saw these new approaches as an opportunity to begin a new cycle of improvement. I wanted to create an environment where students could use the media they consumed every day as my text no matter what classroom or place they might be in.

When implementing pedagogical changes, Buckingham (2003b) encourages teachers to consider how to get students engaged in learning. Buckingham recognized the four elements described by the New London Group but then added two methods that can be used in combination with the four elements. He outlined the conceptual and dynamic teaching methods of multiliteracies (Buckingham, 2003b). When using the four teaching elements, teachers should consider how the information is delivered. In the conceptual method, teachers start with the students’ existing knowledge, like cultural media references the students are familiar with. As students mature they develop an analytical language for understanding media. For example, when I teach camera angles, I will use the conceptual method in my overt instruction. I will provide examples of camera angles from media products they are familiar with. Building on students’ existing knowledge creates common ground between the student and the media product. This allows the student to focus on the analytic vocabulary and not on understanding the media product itself.

The dynamic method has students cycle through the process of “action and reflection” (Buckingham, 2003b). In the dynamic model students learn through situated practice or critical framing as they produce media products. Students cycle through trial and error as they analyze their experience. This requires teachers and students to work together to plan, analyze, and create multiple media products or artifacts. The teacher must provide overt instruction and situated
practice to scaffold the learning environment to support student learning (Buckingham, 2003b). The dynamic method would follow the conceptual method after students became familiar with the analytical vocabulary. Using the conceptual method as a starting point, students build on their own knowledge and vocabulary as they cycle through production and reflection. Buckingham’s methods are designed to help engage the students in the classroom. Properly using the technology and cultural media examples in the classroom through the four models suggested by the NLG helps ensure that students learn critical literacies. Incorporating multiliteracies across the curriculum will help bridge the gap. It is possible to incorporate these pedagogical changes in any classroom. These methods benefit from access to technology but do not require it.

**How to Use Technology**

Buckingham talks about how technologies, especially computers, have become essential in-schools as a tool for teaching students in today’s media saturated world (Buckingham, 2003b). Buckingham points out that schools and parents expect that there will be immediate benefits to having a computer in the home or classroom, often without considering what these computers or technologies will actually be used for (Buckingham, 2003b). I was guilty of this when I first started teaching. I expected the best and newest technologies, even before I had thought about how I could use the technology in my curriculum. Buckingham points out that despite parents and schools purchasing technology for educational benefits, most students report using the computer for social interaction, gaming, and occasionally homework. Buckingham says that these technologies have become more than educational tools; they have become an integral part of popular culture either as a delivery mechanism or a portal for social interaction (Buckingham, 2003b). Teachers need to tap into how students use technology before spending money on new
technology. Just putting computers into a classroom is not making a pedagogical shift toward multiliteracies. When incorporating multiliteracies in any subject, it is more important how you use and analyze media and technology, not what technology you have.

**Basic Principles**

NAMLE (2007) has outlined some basic principles of media literacy education (see Appendix B). These principles of media literacy education begin by stating that the media is not inherently bad and that we need to understand the media in order to make better choices and be informed and active citizens (NAMLE, 2007; CML, 2008). In this thesis I focused on four basic principles:

- Media Literacy Education requires active inquiry and critical thinking about the messages we receive and create.
- Media Literacy Education builds and reinforces skills for learners of all ages. Like print literacy, those skills necessitate integrated, interactive, and repeated practice.
- Media Literacy Education recognizes that media are a part of culture and function as agents of socialization.
- Media Literacy Education affirms that people use their individual skills, beliefs and experiences to construct their own meanings from media messages (NAMLE, 2007).

How a teacher applies the principles of media literacy might be different in an English course than it would in a history course, but these principles are the fundamental media communication skills and are applicable across the curriculum. NAMLE created a general set of
MEDIA MEETS SCIENCE

principles of media literacy that can be adapted into any curriculum (NAMLE, 2007). You might apply this idea in an English class by adapting a research paper into an appropriate media genre for a specific audience outside of school. Having students asking questions and researching how and when technology should be used in an English class will develop multiple literacies (Borsheim et al, 2008). Another implication for practice says, “media messages are produced for particular purposes” (NAMLE, 2007). Identifying the purpose behind why a particular piece of media was produced helps to identify any bias that might exist in the piece of media. Social studies classes could look at the impact of media on war and politics. Another objective of the NAMLE is to help promote active, not passive consumption of media. These principles and implications for practice help teachers customize how media literacy applies in their particular classroom.

These principles should be the underlying foundation when incorporating media literacy into any subject. Certain elements must be included for media literacy to be effective. Hobbs (2010) uses these principles as the foundation of her description of the five elements to media literacy. The five elements of media literacy are access, analyze, create, reflect, and act (Hobbs, 2010).

Buckingham (2003b) emphasizes that critical analysis is an important part of media literacy education. Critical analysis and production will help a student make better choices because they will better understand the messages in the media. Buckingham (2003b) said:

The skills that children need in relation to digital media are not confined to those of information retrieval. They need more than lessons in how to use word processors or search engines. As with print, children also need to be able to evaluate and use information critically if they are to transform it into knowledge.
Furthermore, digital literacy is more than simply a matter of protecting children from the dangers of digital media. As with older media, children need to be empowered to make informed choices on their own behalf, and to protect and regulate themselves. And just as print literacy involves writing as well as reading, digital literacy must involve creative production in a new media as well as critical consumption. (p. 177)

Buckingham makes an important distinction between teaching “through” the media and “about” the media (2003b). Media literacy education is not just using media or technology to teach, but studying the media like a text (Buckingham, 2003b; Hobbs 2005; Kist, 2005). Once a student is prepared to access and analyze and critique a mediated presentation, they can individually provide a moral framework and explore media on their own outside of school (Brown, 1998). As a teacher, I began to see the fundamental communication skills that needed to be incorporated across the curriculum. I felt these skills would be applicable long after our impressions as teachers have faded. Literacy in the classroom should be used to help the masses be active participants and not “static” in the flow of information (Brown, 1998). To be static is to be a passive consumer of media as opposed to an active consumer and creator of media. Active participants analyze, create, and reflect upon their mediated experience. In order to prepare students to be active participants, teachers must understand how to use media and technology correctly in the classroom.

This study focuses on a main question: What are the experiences of two teachers who work together to implement media literacy principles into a science curriculum? I ask this question because the current state of media literacy is at a critical implementation stage.
Practitioners need to explore its role in the classroom. Hobbs (2010) said, “The time to bring digital and medial literacy into the mainstream of American communities is now” (p. vii).

Everyone must acquire the skills available through media literacy to fully take advantage of this media-saturated culture. Hobbs (2010), calls for an implementation of media literacy in the K-12 and community education curriculum to be supported by political and legislative support. These skills have practical value and need to be recognized as important to our future (Hobbs, 2010; Buckingham, 2003b; Kist, 2005; NAMLE, 2007).
Specific Aims

The goal of the study.

The purpose of this study is to explore my experience while implementing media literacy in a science classroom. I started with a question: what are the experiences of two teachers who work together to implement media literacy principles into a science curriculum? To do this I looked at my own experience as I collaborated with an Advanced Placement Environmental Science (APES) teacher, Robert Steele, and implemented principles of media literacy in the APES classroom. Traditional literacy is the most common form of communication in learning and teaching (Kress & Jewitt, 2001). Media is usually looked upon as the supplemental material, but in a science classroom this may not be the case. The words “multimodal communication” describe the environment in a science class (Kress & Jewitt, 2001). Multimodal can be defined as using any object—physical, textual, visual, or audible—in any combination to create meaning or communication (Kress & Jewitt, 2001).

Multimodal learning can level the playing field in a science class (Kress & Jewitt, 2001). Individuals learn and relate to communication in different ways. Expanding the ways in which a teacher can communicate with students increases the chance that learning will happen for more students. Science can be a visual and hands-on learning experience. I felt that science class would be a great place to explore the use of media. This study has become a personal model for expanding media literacy across the curriculum. It has helped me to ask myself what can I do to get more teachers to incorporate media literacy in their classrooms? What role does cross-curricular collaboration play in implementing media literacy across the curriculum?
The project.

In the district where I teach my Career and Technical Education (CTE) advisors were strongly encouraging teachers to emphasize literacy in their courses (Golding, 2009). I saw this as an opportunity to gain support for my project. I proposed that I emphasize literacy through media by taking my production-based students into a science classroom. I received the support and permissions to formally study this process. The door had been opened for me to explore taking media literacy across the curriculum.

The AP environmental science class had several field trips planned throughout the year. My media students would join with Steele’s science students on their last field trip of the year as they studied water systems and water quality in the local streams, rivers, and lakes. We chose this particular trip because it was scheduled after the AP test, which would minimize interfering with the science students’ test preparation, and the warmer weather would make it easier to be outside. The media students would be assigned to a small group of science students and work together to produce a 1-3 minute video that described their experience and activities. The media students were to bring to the group the knowledge of production elements and how to visually tell a story. The science students were to provide the techniques for collecting and interpreting data. Together they needed to decide on the best ways of conveying information though the medium. They could choose to do a traditional documentary style or take a narrative approach. They were given leeway on what the final product looked like.

I was hoping that by taking my production students into a science class they would be forced to think about production in a different way than they were used to. It was expected that both the production students and APES students would benefit from interaction with their peers.
Production students were responsible for working with the APES students to develop the visual and audio elements from the APES field trip. The student-produced videos documented the fieldtrip while reflecting the students’ knowledge of the science curriculum.

Steele and I guided the students through both the science curriculum and the production requirements. All students were asked to learn about the science curriculum and how to collect and critically analyze images and audio. Students from both classes worked together to develop the best product for their group. Students were asked to collaborate to ensure that the topic was properly addressed and that the correct images, dialogue, and audio were used to communicate the science curriculum effectively.

This collaboration took place over a period of several months during the 2008-2009 school year, with the production students and APES students working together in the spring of 2009. All students viewed each other’s products at the end of the unit and had the opportunity to respond and reflect upon the productions.

**Contextual information.**

TV Broadcasting is a Career and Technical Education (CTE) course offered at the high school level. TV Broadcasting fulfills the CTE credit requirement for graduation in Utah (ASD, 2011). CTE classes are designed to help students enter the workforce after high school. This course is designed to help students develop skills for entry-level positions in TV Broadcasting.

State standards for the course are designed to help students understand basics of camera operation, lighting, audio, editing, and future career options. Students should participate in a school project, learn to communicate verbally, write effectively, develop leadership skills, work in groups, and create a portfolio (USOE, 2009). These skills are traditionally gained through
news production as part of school announcements or by competing in various student film competitions.

This TV Broadcasting class consisted of 9 students, an abnormally low number for this class. Average enrollment for this class is 18-20 students. I chose to use this class because I felt the low numbers would allow me to focus more on the study and less on student management. The role of these students in this project was to collaborate with the APES students in developing the appropriate media to represent the finding of their field trip.

The Advanced Placement (AP) program was created by the non-profit organization, The College Board. The purpose of AP courses is to provide high school students the opportunity to earn college credit. Each course concludes with a test to determine the amount of college credit the student receives for the course. AP tests are rigorous and designed to assess the level of student knowledge in specific subjects as they prepare for college (Goodwin, 2008). The Advanced Placement Environmental Science [APES] course is designed as an entry-level college course that might be taught in a variety of science courses at the college or university. Students should be familiar with general concepts in biology, life science, physical science, and algebra. The APES pedagogy is focused on the science of the environment. How a teacher teaches the course is left entirely up to the instructor. The instructor is encouraged by the AP committee to be familiar with the APES curriculum and then teach using local environmental issues (Goodwin, 2008). The APES course allows teachers to individualize and adapt the course around local issues and resources. Local issues related to this study are rain/snowfall, renewable or clean power creation vs. coal burning and mining, soil and water quality, human population growth and animal habitat.

According to Goodwin (2008), National Director of Advanced Placement Environmental
Science Education, it is important for the teacher to be certified in the curriculum but, “perhaps more important than any specific certification is an interest in and curiosity about environmental issues, a willingness to collaborate or perhaps team teach, flexibility and readiness to learn about diverse topics, and a positive orientation toward fieldwork” (p. 3). In preparing this study it became apparent to me that these two areas, TV Broadcasting and APES, were a natural fit to work together. In the AP Environmental Science Teacher’s Guide, teachers are encouraged to provide laboratory experiences for students to apply what they are learning in class. Teachers are also instructed to look for opportunities to team-teach (Goodwin, 2008; Golding 2009).

Why APES?

There are several reasons why I chose to work with Robert Steele and his Advanced Placement Environmental Science class. First I have a good working relationship with Robert Steele. Logistically this was a perfect fit. I was teaching TV Productions at the same time as Robert Steele was teaching the AP Environmental Science class. Science classes can be very visual and often use a variety of media sources as instructional material. Gee (2005) describes science as having a language that contains oral, symbol, and print languages, which aligns with multiliteracies. These skills are directly connected to higher levels of school success (Gee, 2005). The science class also would be taking several different field trips that would provide my class the opportunity to document the preparation and the execution of the science. The fact that this was an Advanced Placement class did not factor into the decision to choose this class.
Methods and Procedures

Methodology.

This is a qualitative action research study. Qualitative research has been used in education, and social studies. In the last 30 years qualitative research has also become common in education as a way of improving teacher practice (Creswell 2008). Qualitative research provides perspective about people and culture (Berg, 2007). Culture is defined as how people interact with each other and their surroundings. Qualitative research can help a researcher organize and study things that are difficult to quantify like body language, symbols in the environment, or the investigator’s journal (Berg, 2007).

Action research, a qualitative research method of study, begins with a question, cycles along a narrative arc, and concludes with a variety of possible answers to the original question. In this study we organized our study into (a) planning the project objectives and project; (b) execution of the project; (c) reflecting on the experience; and (d) creating recommendations for changes in our practice and pedagogy. According to Creswell (2008), action research falls within qualitative research, commonly used by teachers who want to improve their own teaching. Action research can help a teacher solve a problem or improve teaching practices. The researcher will identify the research questions and then gather information about the question. Next the researcher will analyze and interpret the data and share the results with participants and others who can benefit from the study. The action research cycle will generate conclusions and additional questions at the same time and the cycle begins again following a slightly modified path. The action research cycle has been described as a spiral or a set of circular actions (Berg, 2007).
Berg (2007) described three modes of action research: technical, practical, and enhancing. The third mode, enhancing, best fit this study. In enhancing mode there is a specific goal that needs to be addressed in the day-to-day problems faced by practitioners. Berg describes an application for the enhanced mode of action research as a collaborative action research study looking at specific questions that one or more of the researchers have an interest in exploring. This description fits this study. Steele and I are collaborating as a means of exploring a day-to-day issue: what is it like working together to implement media literacy into an advanced placement science classroom? I instigated the research but Steele shares the interest in exploring better ways of using media in his classroom. As practitioners and participants in this study it was best for us to design the study in a way that would allow us to study our own classrooms, and a qualitative action research design allowed us to do that. I chose a research method that would allow me to ask questions about how to apply media literacy across the curriculum. Action research allowed me to ask questions about my own practices.

I have an obligation to improve the field of knowledge for others through my voice. Even though I am a participant/researcher in this study both Steele and I wish for others to find this study useful. We recognize that as participants there will be some degree of bias in the data but we have tried to maintain rigor and be open about this process (Bullough & Pinnegar, 2001). I have tried to be clear about our purpose and open with how we collected data. I have tried to accurately portray the context in which journal entries or comments were made. This was our personal experience but we hope it will be useful to others who are also exploring the role of media literacy in subjects that traditionally don’t include media elements.
MEDIA MEETS SCIENCE

Context.

This study took place in a public high school in the intermountain west. The school had 1300 students ranging in age from 15-18. The study involved a TV Productions classroom and an Advanced Placement Environmental Science classroom with students in 10-12 grades. The APES course had 20 students and the TV Production class had 9 students. Students had varied levels of experience in science and media production.

Data collection.

The majority of data collected came from the communication between the principal investigators [PIs], Robert Steele and myself. We kept individual journals throughout the study and audio recordings during our collaboration and planning meetings. Student data was collected but was not the primary focus of the study. All student data collected was done in accordance with the stipulations in the IRB. After grades had been assigned for regular class work, students who submitted a signed parent permission form completed a survey (see Appendix C). Student data was collected with the purpose of determining student interest and feedback for similar collaborations in the future. Student responses on the survey were anonymous. The students also produced videos. Videos were screened and class discussion about the videos occurred on the last day of class. Because this study took place at the end of the school year grades for the course had already been assigned before the surveys or final video products were reviewed. Student participation in the survey and video quality were not part of the students' grade. Video artifacts, PI meetings and journals, a student survey, and the experience of documenting this project accounted for all data used for this study.
Data analysis.

In grounded theory, the theory that is used to analyze the data arises from the study itself (Berg, 2007). This study used grounded theory as a way of coding information related to the study. Coding the data is the process of comparing the current literature with the data from the study in relation to the main research questions (Berg, 2007). When using grounded theory the researcher identifies the themes that revolve around the main research question. These themes are then used as categories that help identify what parts of the data are important. This coding process helps the researcher identify what data are relevant to the study.

Using grounded theory I looked for information in the data regarding the purpose of this study, which was to document the experiences of two teachers who worked together to implement media literacy principles into a science curriculum. I checked the data against Hobbs’s (2010) call for K-12 to implement media literacy to, “help students develop access, analysis/evaluation, and creative competencies in relation to the academic subjects of math, language arts, social studies, science and health education” (Hobbs, 2010, p. 22). Hobbs (2010) said “People need the ability to access, analyze and engage in critical thinking about the array of messages they receive and send in order to make informed decisions about the everyday issues they face regarding health, work, politics and leisure” (p. vii). This is the heart of media literacy. Hobbs (2010) states, like many others before her, that in our media saturated culture, media literacy needs to be a more important factor in our education system. As part of this implementation Hobbs listed five issues that needed to be considered when introducing media literacy across the curriculum (Hobbs, 2010):

- Moving beyond a tool-oriented focus that conflates having access to media and technology with the skillful use of it.
MEDIA MEETS SCIENCE

- Addressing risks associated with media and digital technology.
- Expanding the concept of literacy.
- Strengthening people’s capacity to assess message credibility and quality.
- Bringing news and current events into K–12 education.

This implementation across the curriculum would help students more effectively use and create media and information. These five issues from Hobbs as well as the core principles of media literacy education (see Appendix B) will guide the data analysis.

The participants.

Robert M. Steele graduated from BYU in 1982 with a Bachelor of Science in Secondary Education. He has been teaching high school for 27 years. He is qualified to teach Biology, First Aid, Medical English, AP Environmental Science, and Medical Anatomy. While teaching high school he has had many opportunities to interact with students in both academic settings and extracurricular activities. I welcomed his experience and appreciated his openness to new ideas and technologies.

I graduated from Utah Valley University in August 2005 with a Bachelor of Science in Integrated Studies. At the time of the study I had four years of high school teaching experience. I teach multimedia and television broadcasting. Previous to teaching high school, I was involved in professional production with the local NBC affiliate. Other professional experience includes freelance camera work and commercial art and graphic design.
Limitations.

I entered this study knowing that I would be putting my own practice under the microscope to be analyzed and critiqued. I saw this as an opportunity to gain a fundamental understanding for myself of what media literacy was outside my classroom. I don’t expect this study to directly transfer to another situation or classroom environment. I don’t have any evidence that teaching media literacy improved teaching ability or directly improved student learning. But I tried to be as detailed as possible about our situation so that it may benefit the field of media literacy. This being the first time I have entered into a collaboration like this I collected data I thought would provide me with the best understanding of what happened. I look forward to expanding media literacy across other curriculum and will continue to improve my own practice.
CHAPTER THREE: RESULTS AND EXPLANATIONS OF THE DATA

The Data

The goal of this study is to explore implementation of media literacy in a science class. In analyzing the data, I started with Hobbs’s five points of consideration and a specific question: What are the experiences of two teachers who work together to implement media literacy principles into a science curriculum, specifically in relationship to the five ideas Hobbs recommends considering when introducing media literacy across the curriculum? These include moving beyond a tool-oriented focus that helps students understand that access to media is not the same as skillful use of media themselves; awareness of risks in exploring and creating media with digital technology; widening the concept of “literacy” for both groups of students; helping all students increase their skill at assessing the quality and credibility of media messages; integrating internet media materials about current events into media production and advanced placement science classes. To do this I looked at my own experience as I collaborated with Robert Steele and implemented principles of media literacy in the [APES] classroom and we observed student’s direct involvement with analyzing, creating, and reflecting on digital media on significant science issues.

The data collected came from a variety of sources. Steele and I kept individual journals throughout this process that contained notes and observations we made while collaborating and working with students. These journals allowed Steele and I to keep track of student reactions to the activities as well as our thoughts about this experience. Journal entries did not include names of students. The only changes I made to notes or journals were for clarity and to preserve context.
As principal investigators we also created simple individual lesson plans that we used at the beginning of this study (see Appendix D and Appendix E). These lesson plans guided us in planning the learning activities and making sure that we addressed the objectives of both subject areas. For example, I used the word “podcast” in my lesson plan (see Appendix E) because my video students were already familiar with the term. A podcast is media content like video, audio, or text that, when the creator makes it available, is automatically pushed to subscribers through the Internet. Unlike YouTube where users go to YouTube for content, a podcast is automatically pushed to the user if the user is a subscriber. We were not going to produce content that would be uploaded to a server and pushed to subscribers. But I chose to use the word because as a video class we had subscribed to several different podcasts and incorporated them into previous curriculum. I wanted my students to have a reference point for beginning something new.

As part of preparing the students in both classes for video production we analyzed several different video products related to environmental science available on the web. Steele suggested we use some of the videos he used in class, but I wanted to use videos that students had not already seen and some produced by students. I felt that watching only professionally produced videos would make it difficult for students to obtain that level of quality. To give the students some context for what they would be asked to create as a final product, we searched environmental science high school on YouTube and watched several of the top results. In addition, we searched iTunes U for environmental science. We searched iTunes U because it is designed as an educational source of information containing video and audio products. We clicked on videos that appeared to be created for a high school science class but we also watched a few professional looking videos that were also listed with the results. The videos ranged from commercials for taking environmental science at a particular school to videos created by high
school students about a project they conducted in class. Both classes analyzed these videos for content, presentation style, and technique. The videos varied from amateurs making video slideshows with music to professional looking videos with dialogue, voice-overs, and graphics. The videos also varied from documentary style to simple narratives. This wide variety of video quality, style, and technique helped us provide the students a context for what they might create.

Another important source of data for this study were the videos produced by the students about our field trip. I have included screen shots from our student productions and a description of what is happening with each screen shot in the appendix (see Appendix F, Appendix G, Appendix H, Appendix I, and Appendix J). Students produced five videos: (1) Dissolved Oxygen, (2) Nitrate Levels, (3) pH Scale, (4) Stream Flow, and (5) Turbidity. I adapted the titles of the videos to the subject that group studied rather than including titles that included student names. In accordance with my IRB, I have removed student names from all the data. Both the science and video students documented the field trip. Over several different sessions at school students created video products similar to the videos we reviewed in class before the field trip took place.

We also conducted a student survey at the conclusion of the entire experience (see Appendix C). In accordance with the IRB, the surveys were anonymous and student participation in the survey was voluntary. All the students turned in a parental permission slip to participate in the survey. Three students wrote on the survey, “I choose not to participate”. The surveys were collected and then set aside until after grades had been assigned.

My motivation for doing this study stemmed from my desire for my class and my students to be more involved with other curriculum and students in the school. Like many teachers I know, I feel my class is very important. Media literacy is important to every student,
not just the ones in my class. Because I feel media literacy is important, I wanted to better understand how to incorporate media literacy into other subjects in a practical way. Working together with a teacher in another discipline seemed an ideal way to practically structure media literacy experience across the curriculum.

**Logistics**

**Before the field trip.**

After gaining the proper permissions and IRB approval, Robert Steele and I began to organize the collaboration. The study started rather informally with a discussion about what we each wanted to get out of the experience. I wanted this collaboration to provide me with a better understanding of media literacy in other subjects. Robert Steele was excited and said that for several years he had wanted to incorporate media in his science classes. He saw this as an opportunity to gain some experience using more technology in his curriculum.

Steele had three concerns. First, if not carefully planned we might take too much class time away from the science and the students’ preparation for the year-end AP test. I acknowledged this as a valid concern and one that I shared. My purpose in proposing the collaboration was not to distract from the students’ test preparation but a hope to enhance both the video and science class experience. Second, he was concerned about the level of involvement his science students would have in the actual production of the media. Steele was worried that his science students would not get enough experience or exposure to the media portions. With the cameras and editing equipment being supplied by the TV Broadcasting class, Steele wanted to make sure that his students were more than performers in the project. Third, he asked, “Why does this matter (*to other teachers*)?” This was a question that was something I felt was very
important; how to share this experience with others in the school or elsewhere was always on my mind throughout the study.

After this initial talk, we structured the experience around the APES spring field trip. The annual spring field trip took place immediately following the AP test. The field trip involved going to several local rivers and streams to test water quality and identify environmental factors like snowpack, erosion, and pollution on the different water systems. Robert Steele and I met formally three times in preparation for the activity. The field trip was scheduled after students had taken their AP tests, but class time before the AP test was needed to prepare our students for the field trip. In preparation for the field trip we decided we needed to meet with all the students twice before taking the trip. These two meetings took place during class time and were used to prepare students for the field trip and creation of the media products documenting this process.

**Preparing for the trip.**

In preparing for our trip there were two parts: preparing for the activity and preparing the students. Preparing for the activity included things like determining the date of the field trip, scheduling the bus, getting administrative approval, and organizing the science and media equipment. Steele had more experience in organizing a field trip and did most of this part of the planning. Steele was more familiar with the destinations and our school’s administration expected his annual spring field trip. We wanted to plan the trip when the weather looked warm and sunny. Steele pointed out that when he had done trips in the past in poor or rainy and cold weather that the students were less willing to participate and generally want to spend more time on the bus than out collecting data. When the weather was great and the students wanted to be out in the sun rather than sitting on the bus.
We each took care of preparing our own equipment. The equipment needed for the science aspect of the study was currently in the science lab and did not need to be purchased or updated for this study. The device used by the science students to sample and test water was called the LabQuest by Vernier. The students used the LabQuest with different accessories to measure things like pH, turbidity, stream flow, and dissolved oxygen. The media equipment used were small MiniDV camcorders. Like the science equipment, these cameras were things the school already had available for student use. The cameras did need to be scheduled because they were shared with another media class. The cameras for filming and the computers for editing were the primary pieces of media equipment used. There were not enough tripods for everyone to use one, but there were two tripods available for the students who wanted one. I had to make sure that before the trip the camera batteries were charged and that there was a new tape for students to use. There were enough computers for everyone to analyze the scientific data and edit the videos. The video editing software used was Apple’s Final Cut Pro or iMovie, depending upon the students’ preference. Video editing took place after we had returned from the field trip and students had access to the computer labs both during class time and after school.

Preparing the students.

Our journal entries make several references to the time needed for preparing students. Time was a constant concern for both of us. We knew that not spending enough time preparing students would result in poor media products. At the same time, we could spend too much time preparing students and burn out the students on the project and possibly interfere with the science students’ preparation for their AP test.

The preparation of the activity included planning activities that met our objectives (see
Appendix D and Appendix E), and preparing students to use the equipment and tell a story. Our objectives were to have each group explain their data through the medium of video and describe how that data reflects the local environment.

To prepare the students we decided that we needed to meet with both classes two times before the field trip. Our first meeting took place in the science classroom where we put the water testing equipment in the hands of the students and had them learn how to take samples and calibrate the sensors. The media students were also there and learned how to use the science equipment. The media students also became familiar with what water sampling looked like so they could begin to visualize what images they needed to capture to tell the story.

Our second meeting as a group took place in the media classroom. This meeting focused on the different ways to tell a story through video. This second meeting was when we watched the video examples from YouTube and iTunes U. This second meeting was where the science students were exposed to what the finished video product might look like. We looked at commercial, documentary, and narrative formats and discussed the advantages and disadvantages of each.

The planning and preparation stages of the project were very important. Buckingham (2003b) talks about the need to create context for students as part of the learning process. It was in the planning and preparation stage that we introduced all students to related vocabulary and techniques they would need later. This was also the most difficult part of the project for the students because the concepts and instruction was abstract. We watched students complain as they struggled to outline ideas and work together on something they couldn’t yet visualize.
The field trip.

The field trip took one full school day. We left at eight-o’clock in the morning and drove up a nearby canyon. As we drove, Steele talked about local issues like wetlands, waste disposal, city planning and urban development. We looked at the typography of the areas and discussed how to capture the images that told the story.

We made several stops along a local river system. Using the LabQuest equipment, students took different water measurements like the flow rate, pH, turbidity, temperature, and stream dimensions. I asked students to explain to me the terms I kept hearing them use. Flow rate is the amount of water traveling through a point on the river in a given amount of time. pH is the acidic or basic level of the water. The acidic and basic levels of the water determine the types of life that water can support. Turbidity measures the amount of different particles the water contains. Turbidity indicates different environmental factors like pollution from runoff or industry and the amount of energy contained in the stream needed to suspend those particles in the water. The more particles in the water, the more a treatment plant has to spend cleaning the water for drinking. After students made these measurements they observed and noted details about the environment such as the slope, soil, wildlife, development, water needs of the community, and plant life.

After the trip.

After the field trip, with the AP test done, the schedule allowed both classes to meet for several class periods where final media products were scripted, edited, and published. When we met as a group for the last time we showed the finished products to all involved and had a class discussion similar to the discussion we had in preparing for the trip. After discussing the
experience and the media products, students filled out an anonymous survey. Students’ grades were not affected by their participation in the survey. The surveys were collected and then stored until after final grades had been submitted.

Data Analysis

I have sorted and analyzed the data using Hobbs’s five considerations for introducing media literacy across the curriculum, along with the Core Principles of Media Literacy Education (Hobbs, 2010; NAMLE, 2007).

Moving beyond a tool-oriented focus that conflates having access to media and technology with the skillful use of it.

Part of the purpose of media literacy education is developing skills of expression to communicate effectively (NAMLE, 2007). The tools used to communicate vary depending upon the medium but no matter what tools you use to communicate you still need to use them correctly. I like that Hobbs argues that the tools and the skills are inseparable. After our first meeting with the students I wrote in my journal,

We met with both classes today. The science students split into groups and started calibrating and learning the equipment. I assigned media students (two per group of science students) and then I worked from group to group and talked about how to show the story.

It was necessary to not only get the tools needed for the job into the students’ hands but also to teach them how to use them. In science it would do no good for the students to have the LabQuest equipment if they didn’t know how to use it or calibrate it correctly. This was the case
with the group measuring dissolved oxygen (see Appendix F). Despite having received training on how to use and calibrate the equipment, this group failed to calibrate their sensor correctly. They discovered this after the field trip when they analyzed their data and found the results to be inconsistent with the other groups’ findings. When we asked what source they used to calibrate their sensor they realized they didn’t use water from the control group. This is something they acknowledged in the video. This group didn’t totally fail. They had made a mistake but were still able to identify the failings of their data. This was not the original objective but it does show the students’ ability to recognize inconsistencies in the data.

Teaching communication skills requires having the tools. When I talked with students on our first group meeting I asked them to describe to me what things they could predict would happen on the field trip and what needed to be filmed. Because the students were physically holding the scientific equipment they described how to perform the measurements but they did not describe how they would use the camera. They didn’t or couldn’t visualize different camera angles. I talked with the students about how the camera can be used to tell different kinds of stories. I asked them to think about what the environment might look like up in the canyon and how these environmental factors could influence use of the camera. All they talked about was the measurements, not the camera shots. Asking both groups of students to predict aspects of the media project was ineffective while the science equipment was physically in their hands.

After we met Steele wrote, “My students are really excited about this project.” I was also excited about the project and had a few concerns as well. I wrote in my journal, “I think we will be successful with the products but I worry about all the students doing the same thing and producing a generic video.” I was hoping that each group would develop a different idea so we could critique and explore the different choices made by the students. Spending the time with the
science class first was a great idea because it allowed all the students to know the science equipment and objectives. This was information they would need when we started talking about the media part, or storytelling aspect of the project. Mixing the science and the media together forced us as teachers to really think about how to train students to collect data, as well as how to shape that data into something that could be shared with others. Just having a camera or a LabQuest didn’t guarantee we would end up with a video that communicated a message. Communicating the intended message required skillful use of the tools, no matter what tools were available. Poor use of the tools could result in a message being lost or misinterpreted. This was the case in the video “Dissolved Oxygen” (see Appendix F).

In our second group meeting we watched several different videos from YouTube and iTunes U. We discussed the different elements the creators used in the video to communicate meaning or emotion. The elements, or tools, we identified in the videos were narration, music, interviews, camera composition, graphics, and title screens. As a group we discussed how each video combined these different elements to communicate its message. The class pointed out that the professional videos combined the elements more skillfully than the student productions but that didn’t mean they were better.

It was at this point Steele and I discovered that to the students, “better” meant “more entertaining”. The sixth principle of media literacy education states, “people use their individual skills, beliefs and experiences to construct their own meaning from media messages” (NAMLE, 2007, p.5). The media culture of a high school student is dominated by what is funny to them. The value of a piece of media is judged by entertainment value not by content. At this point Steele and I discussed with the students their responsibility in this process to find the balance between information and entertainment and how that would require them to skillfully use their
As principal investigators we were influencing the students to try and communicate the science and create an attractive and meaningful media product. We talked with both groups of students about what other factors influence the creation of media. When we looked at our sample media products on YouTube and iTunes U, some of the student productions were created as an assignment in a science class. The motivation to get a grade resulted in a final product but not a very good product. We asked the motivation behind the professionally produced videos and the students identified it as educational, but Steele and I pointed out that even the best professionally produced educational video has to be paid for, and that money can influence the final product. Money is a big influence in media creation but no matter how much money is spent creating a media product, if producers are not skillful in how they construct their message, they can send a very different message than what was originally intended.

After discussions about the culture of “funny” and the purpose and influences behind the media, we challenged the groups to find a balance between informational and entertaining elements and to make their videos as good as or better than what they saw in class. By the class response to the challenge it was obvious to Steele and me that the students were confident they would make better videos than the examples shown. This confidence was a positive sign for us as teachers but we found that learning how to skillfully use technology takes time and repeated practice. For many of the students this was their first time making a video and they had more confidence than experience.

**Addressing risks associated with media and digital technology.**

Hobbs describes three issues of safety related to media and technology: Content risks,
conduct risks, and contact risks that need to be considered when implementing media literacy (Hobbs 2010). Content risks are images and messages in the media that may be inappropriate in a school setting or for the age group in the classroom. Conduct risks are referring to student behavior while creating media, like taking inappropriate or invasive pictures of themselves or others and sharing them. Contact risks occur when students, often minors, seek or are approached by someone through the media that may not be who they claim to be. The culture of the school in our study was conservative in nature. Access to media content in the school was very tightly controlled and filtered. Because we wanted students to have some input on what videos we watched, we didn’t pre-screen the video content showed, we took a risk. Luckily we didn’t have any problems with the content of the videos chosen by the students.

After teaching video production to students for several years I was very familiar with issues related to student conduct and technology. In our class discussions students pointed out that to them “good” meant “it was funny”. In my experience teaching high school I have learned that “funny” rules. Every student production or presentation has to be funny. The lengths students will go to be funny range from being silly, dangerous, or even mean. I give a “stupid kids” lecture every year to my students before I put any equipment into their hands. I usually show videos former students have produced that had caused them to be hurt, damage equipment or property, get arrested, or embarrassed themselves or others. This lecture allows me to discuss with my students their responsibilities when they make a piece of media, especially with social media. When I first show these videos, students think they are good because they are funny, but as I explain the consequences of the student behavior, I point out that “good” does not equal funny. I emphasize over and over to my students that they are responsible for what they do; even if their friends think that tying a couch to the back of a truck, lighting the couch on fire, and then
driving down the street to film it is a good idea, it really isn’t.

Since I have started teaching video production I have had one student taken to the hospital in an ambulance, one arrested, one suspended from school, several cameras obliterated, and several students questioned by my administration because of the content of their videos. When we prepared students for doing this study I reminded the media students of their responsibility when they had a camera in their hands. The purpose of media literacy is centered on helping people be better citizens and participants in our culture. Learning how to act appropriately when creating media is a skill that has to be learned. Sometimes, unfortunately, that is a lesson learned the hard way. Because Steele and I were present every time the students were using the equipment I was not concerned with their conduct as much as I was concerned about contact risks.

Hobbs, when talking about contact risks, is mostly referring to person-to-person contact through technology, contact that occurs between a student and someone on the Internet who is not who they claim to be. This is a valid concern but was not an issue in this study because we were not creating products that would be shared beyond our group. Final products were created in class on school computers in a lab where social media sites are filtered and Steele and I were present at all times. It is possible that a student could have taken a copy home on a jump drive and uploaded the video to the web but these were science videos that students did for a grade and they didn’t really seem very excited to share them in class, let alone take them out to show the world. However, the contact risks that were a real threat in this study were environmental. When we arrived at our first water testing location, it was along a fast moving river with steep riverbanks. I realized when we arrived that students were putting themselves at risk of falling into the river and being swept away in order to get the right shot of the environment. At all of our
MEDIA MEETS SCIENCE

stops there was some type of environmental risk, mostly minor things like walking through brush or walking along a road, that we had not prepared for. Nothing happened during our trip but the risks were real. I noted in my journal that all students had to find ways to collect the scientific and media data despite the obstacles that existed at each location. The locations varied and so did the hazards.

**Expanding the concept of literacy.**

One thing that I have enjoyed as I have taught media has been expanding my concept of literacy. Expanding what counts as a text to include media and communication technology has increased the amount of resources I have at my disposal. By expanding the concept of literacy in my classroom I have used media my students consume at home as a text in my teaching. In this study I wanted to show some video examples that were not professionally produced for a classroom setting. I felt that it would be important to use media examples as a text that students could relate to and have access to outside the class. By searching for videos on YouTube it allowed us to discuss media that was available to the students any time. In my media classes we use commercials from the Super Bowl as one of our texts. These particular commercials are things they choose to watch, talk about, and share with each other. In my classroom they become a text that allows us as a class to discuss communication strategies, target audience, production techniques, writing, lighting, sound, cultural significance, theory, intertextual references, and why “good” does not equal “funny”. This has become a natural thing for my media students; they know if Mr. Brown has something to show it isn’t “sit back and be entertained” time. The science students were not accustomed to this and it was difficult for them to pay attention to a video after we watched it two or three times. The science students didn’t know how to assess the
credibility and quality. This skill takes repeated practice and time to develop. Media literacy principle number three talks about developing the skills of inquiry and analysis through repeated practice (NAMLE, 2007).

**Strengthening people’s capacity to assess message credibility and quality.**

Critical analysis just might be the most important element of media literacy. According to the principles of media literacy the first principle focuses on inquiry and critical thinking (NAMLE, 2007, p.5). In English class we ask questions to better understand the characters. In Geology class we ask, “How did this rock get here and what does that mean?” In media we ask, “Why did they chose this camera angle or take this view on the story?” This process of asking questions and reflection is required at all stages of production.

During the second meeting with both classes we analyzed the videos from YouTube and iTunes U. At this point in the process we had explained the project, learned how to use and calibrate the scientific equipment, and were now trying to help students visualize a final media product. We watched each video from YouTube several times. Each time we watched it my video students analyzed the production for things like camera angles, lighting, and how it was edited together. The science students would look for things related to scientific information. This was something Steele and I had not asked them to do. The students analyzed the video product based on what their background was. Media literacy principle number six predicted this when it said people interpret media messages based on previous knowledge and experience (NAMLE, 2007, p.5).

One area both students were familiar with was in judging how entertaining it was, entertaining meaning funny. We asked them why a video was rated good. The answer was
simply because it was funny or had a popular song in it. When we showed a video example that looked professionally done for education the students said that it was not entertaining and therefore was less important. Students found that when the main purpose of the video was to be informational the entertainment value was low. When the video was focused on entertainment, the video had more views on YouTube and the students enjoyed it more and rated it as better.

Steele and I both took some time to talk about finding a balance in the videos they were going to make between entertaining and informational. I pointed out that if a video has really important information but no person wants to watch it then the information is not communicated and is lost. But “fun” and entertainment elements like music and fast cut edits may distract the audience and prevent any information from reaching the audience.

The ability to conceptualize an idea requires practice. The media students could conceptualize a final product but their experience was with student life and athletics. The media students understood montage with music. The media students had never been exposed to writing and editing an academically focused video. The science students were arguing over what facts were important but never talked about why they were important. The science students had practice collecting data but not communicating it. This process was complete confusion for several class periods. With most students having never created more than home videos, the idea of turning raw video into a finished product was beyond them. The students’ confidence in their abilities to produce better video products than the videos used as examples came from their inexperience in making videos. I knew they were in for an eye-opening experience when they compared their finished products to other students’ products and to the examples given.

For our last meeting we all met in my classroom and showed all the finished videos to the group. We structured this discussion similar to the time I showed them the professional videos
and clips from YouTube. I asked them to critique their videos the same way and to look for the information presented, entertainment value, creativity, and music or effects elements. I reminded them about how the purpose and motivation behind the examples shown at the beginning of this study impacted their outcome. I wanted the students to see how their work was similar to or different from the examples shown at the beginning of this study. This was the most important part of the study.

I describe what happened in this last discussion as the “a-ha!” moment. This “a-ha” moment is when all the things we had been learning came together and the students could see how all the elements—like the data, field trip, the media literacy discussions, and the production experience—all related. Several science students commented that just filming the field trip didn’t capture the experience or the data. This was my opportunity to point out that the story they were trying to tell has to be told through a medium and that not all of their thoughts and feelings can translate through that medium. Just having the technology does not mean you will be successful at communicating a message. It is the combination of technology and the skillful use of it that improves the communication of a message through media (Hobbs, 2010). The opposite of this is also true, improper or poor use of technology can distract from the message. One student said during our class discussion, referring to the video “Dissolved Oxygen”, that it had the poorest quality and it felt “not important”. In this case the media student editing the video lost interest in the project and the science students lacked the skills and knowledge to step up and do it. Together this group created a poor quality product and the message was discredited. The students in that group were embarrassed by their video.

After looking at their own productions I reminded them of the challenge Steele and I had given them about producing better videos than the videos we used as examples at the beginning
of the experiment. The class reaction to this reminder was much different from how they reacted to the original challenge. As Steele and I asked what happened to their confidence they told us this was harder than they thought it would be. In Steele’s lesson plan he listed an objective, that students should be able to describe the difference between what was expected and what really happened. Steele was referring to data related to the water tests. But this objective can easily be adapted to the media products as well. They could see how their productions compared to what other students and even professionals were doing. Both the science and media students commented on the differences in style and the effectiveness of how they presented the data. The students recognized when a group did a great job, like in the movie “Turbidity” (see Appendix J), and when a group did a poor job, like “Dissolved Oxygen” (see Appendix F). After this group analysis of the videos I wrote in my journal:

The students identified what media examples they produced were effective at communicating the science, entertaining the audience, and what videos communicated the group’s intended purpose. The discussion reflected upon the experience of producing the movies and how they looked compared to examples used in preparation.

The idea of repeated practice shows up over and over again throughout the literature and throughout my data. Media literacy is a skill that needs to be practiced.

**Bringing news and current events into K–12 education.**

In this study we chose to analyze videos from YouTube and iTunes U. We also analyzed as a group the students’ own videos. In this study we did not use traditional news sources or local current events in this study. I am sure that we could have found media texts for science from the
news and current events. Local environmental issues related to the Environmental Science class curriculum are constantly in the local news. New roads, housing developments, and annual snowfall are local issues that make the local news and are things that we talked about on our field trip. News and current events in the classroom allow students the opportunity to practice assessing media on a topic that directly impacts them or their daily lives. By choosing YouTube as a media source for our study we were using content from a source that most of the students use outside of the classroom. If we had used local media and news as part of our example media products we could have prepped students on how to shoot the local environment. This could have improved our products and is something we should have done if we had time to continue.

**Student Feedback**

As part of this study we conducted an anonymous survey (see Appendix C). Two-thirds of the responses reported having a positive experience. The most positive and negative comments were about working with other students and not necessarily about working with the media and technology. Some comments like, “I think I learned a lot by making these videos,” and “I learned more about editing by watching other videos,” were related to the media literacy aspect. The negative comments were related to group dynamics like “It was frustrating because I did my part but others didn’t”.

When asked about their feelings about mixing the two classes and working together one student responded, “Good! I think media is a great way to help visually teach science.” I couldn’t agree more with that student because that comment was exactly what I was thinking. Most responses said things like “fun” and “I liked it”. One student said, “It was necessary for both skills to be used”.

55
The survey asked about what should be done differently next time. The most common suggestion was to allow more time to develop the whole project. One response said, “It would be better if we had specific requirements or tell us who will watch the video.” I understood that statement to mean the group would have done something different if they had known they were showing the videos to the class or to the whole school. Most of the students asked for more specific requirements of the videos and I think that meant two things. First, I needed to do a better job preparing them for the project in terms of considering the audience earlier in the process. Second, I predicted that the students would have a difficult time trying to tell a story about something that was new to everyone, they did feel they needed more direction and I think they also needed more experience and repeated practice.

When asked what the teachers could have done better the most common student responses were asking for more details of the trip, teaching how to use the science and video equipment, and giving more time to develop a stronger video product. I asked about team teaching and three-quarters of the responses said that it was a positive or good experience. One student said, “Yes, you get two different sides of the assignment and I think that you get more out of it.” Another response said, “Good experiences, learned about other subjects.” Most of the comments were similar to these. The few negative responses about team teaching said, “No, it’s pointless” or “No, ‘cause it is useless.”

The last few questions on the survey asked the students to rate their feelings about the video product and how that product reflected their knowledge of the science. The students rated these on a scale between one and ten, with ten being ‘really good’ or ‘right on’ and one being ‘really bad’ or ‘not at all’. When asked to rate if it is important that media be used to help teach science the responses fell between five and six. The students felt that the media didn’t really help
them learn science, but it didn’t hurt. The last question told me a lot. It asked them to rate the likelihood that, given the resources, they would choose to create videos for other classes. The average response was a seven with the most frequent response being ten. This was one of the most revealing questions in the survey. When given the resources and choice, students would make videos in other classes. I think this is because they see making movies as fun and interesting.

At the end of our last group meeting Steele said that normally his class goes on the field trip and then he puts all the data on the white board and they discuss it as a class. He asked the students if what we did this time was better or if they thought that the video distracted from the science class. Most of the students mumbled that it was better than just looking at a white board, but one student spoke up and said, “It was better because I wouldn’t take this class [video production] normally and I really learned a lot of stuff doing my science through the video.” A second student agreed and said the same thing about the science class. This was a viewpoint that neither Steele nor I had thought about before. This collaboration was mixing subjects and even students together that would not normally mix in our school.

After this experience I asked one student who was abnormally quiet what he thought of the field trip, he said, “It sucked” because he didn’t think about time management on the trip. This student made sure he filmed everything on the first two stops but then was out of tape and enthusiasm for the project with several more stops to go. Time management was an aspect I had not thought emphasizing of in preparing students for the trip. There were times when all the groups were doing the same or a similar thing and we didn’t need to have all the cameras filming the same activity.

I found it interesting that students appeared to get along with each other but after the
videos were shown to everyone then there seemed to be some students who tried to distance themselves from the group. One student, after their video had been shown to the class said, “Hey, I came in three times to work on the video, but no one else showed up.” This student was placing a disclaimer on the video once he was able to compare his project with other student projects.

Looking back on the experience I am really glad about how things worked out. It was through student reflection that the ideas and the concepts that were introduced in planning and execution of the project become practical. My favorite part of the whole project was on the last day when students began to understand what we had been doing. No longer were the ideas abstract; they were practical.

**Recommendations**

After our final meeting I wrote, “Steele and I talked about ‘next time’ doing several videos throughout the year. What worked right this time was the critical thinking part.” What we did poorly was not planning enough time to repeat the experience with the same students.

Because we didn’t have the opportunity to have repeated practice we only got to see students begin to recognize a few of the elements that make up our media. I thought a student was right when I overheard him say, “We should have done this a lot sooner [in the school year] so we would have time to finish”.

Every time Steele and I met to discuss the project we discussed how to tell a story. We talked about how to turn quantified information into results people can understand and relate to and how this is a form of storytelling. Technology was not the story but the tool used to tell the story. This was something we, as the principal investigators understood, but it took several meetings with students to convey this idea.
MEDIA MEETS SCIENCE

Going through this process I discovered that I had to find the line between doing all that I could to help the students be successful without doing everything for them. My role was constantly adjusting. The storytelling and scientific data were both very important. Our data was quantified information that needed to be qualified. Could students make that conversion? Would the data or story get in the way of a successful project? In one journal entry Steele wrote, “I wanted them to think about what the elements were that made a video ‘better’ or a ‘step up’ from the other videos because I wanted them to try and incorporate those elements into their videos.”

To make videos that are a step up requires practice and multiple productions. Like a paper in English class, a media project requires revision and reworking. Students sat in groups and roughly outlined some storyboards for the trip. Most students were not able to visualize the activity and so drawing storyboards was a difficult task. When someone has never edited a video, they lack the experience needed for creating a visual storyboard. To develop this skill a person needs to work on many projects from start to finish. The third principle of media literacy is “repeated practice” (NAMLE, 2007). Media literacy is a skill that has to be developed. Analytical and critical thinking are principles of media literacy that are developed through repeated practice. Like writing and re-writing a paper for English class or producing multiple versions of a single media product, the process reinforces the skill.

Because we didn’t have the opportunity to do several consecutive projects, I realized I had to get students to ask the right questions about their productions. One student was filming his group and stopped and asked why they were doing what they were doing. I watched as the science students stopped and explained the data to the video student; they qualified the quantified. This unfortunately was done while the camera was turned off. I stepped in and explained that what they just did with each other was what needed to be said on the video. This
learning opportunity would not have happened if the student had not asked the question.

In the future as I continue to explore media literacy in other subjects it will be very important to design the project so there is time to create multiple products over the course of the whole year. Kist (2005) described a media literacy classroom as a place where media literacy is a constant presence not just in a lesson or unit. When working to spread media literacy across the curriculum I will need to build long-term relationships for sustained activities. The repeated practice will help ensure students can develop the skills of visualizing the project from start to finish.

CHAPTER FOUR: DISCUSSION

Earlier in the paper I said that students must understand why what they are learning is important if they are to seek learning on their own. I need to add that teachers also need to understand why what they are teaching is important if they are going to seek to improve their teaching of that subject. In essence, an excellent teacher is also an engaged student. Looking back on the study I realized the value of the study to me was immense. As an educator I was able to see when the students really began to grasp an understanding of the concepts of media literacy and how it related to them. Media literacy teaches skills that students can practice and develop while consuming media in school and out of school. Media literacy bridges the in-class experience with the out-of-class culture students are immersed in. Writing this paper has been a long but important assessment of my experience teaching media literacy in a science classroom. I look forward to beginning again the process of improving my own practice and exploring the role of media literacy education in other subjects. Now that I better understand the logistics, I can focus on the principles and gain a better understanding of the role of media in all of our lives.
Which Core Principles Best Apply to APES Curriculum?

What I experienced by going through this process has bettered my understanding of the principles of media literacy outlined by the National Association of Media Literacy Education. These principles have application in all subjects. In this study I felt that all of the six principles applied to the science class, but principles one, three, and six seemed to apply more directly in this study. The first principle described by NAMLE (2007) says, “Media Literacy Education requires active inquiry and critical thinking about the messages we receive and create” (p. 4). I said earlier that students who experience media in school without learning how to be critical of the messages in that media will accept every message as truth. As a teacher, when I stand in front of the classroom I have a forced captive audience that has been molded to accept what I say as how things are. We have to recognize that there are factors that influence what I share with the class. It is important to help students be active participants in the classroom and not passive sponges that master software or memorize buttons to push. We are not preparing robots. We are preparing kids to be active citizens in our communities. In today’s world of information saturation, students need to be taught how to analyze the messages they receive, whether these are movies they watch or a pamphlet they find on a table at school. I watched all the students in this study identify what they thought was effective and what was less effective in the media products used as examples. I challenged them to use the more effective methods. When it came time to watch their own media products, the students recognized that they produced videos that had more in common with the less effective video examples. I watched as students struggled to explain why they created videos they disliked. I kept having flashbacks of the student who could read but not comprehend English as student after student said they didn’t think about what they
were saying as they made the video. They didn’t ‘comprehend’ how video elements were used when creating a video product. This principle was applicable in this study and is applicable in any classroom where students will be watching and creating media products.

The third principle of media literacy education says, “Media Literacy Education builds and reinforces skills for learners of all ages. Like print literacy, those skills necessitate integrated, interactive, and repeated practice” (NAMLE, 2007, p. 6). The most important part of this principle for this study is the last part about repeated practice. This study was designed as a starting point for identifying what media literacy education looks like in a science classroom. Kist (2005) says that media literacy should be constantly present in all subjects and units. Steele and I, looking back upon our experience agreed that we needed to be doing this all year and not just for one unit. Learning how to analyze messages and construct messages requires practice. This is one of the biggest failings of this study. Students displayed an understanding of how messages are constructed and how they can construct their own messages, but that came after the process had been completed. Because we did this study at the end of the year, there was no opportunity to follow up with the students. Repeated practice is necessary for students if they are to build an analytical vocabulary.

This study involved a variety of students who worked together in small groups. Each group was responsible for collecting their own scientific data and media reflecting their experience. As a group they also had to create a video that reflected their knowledge and experience. All the groups were on the same bus, went to the same locations, and collected data side by side. When we watched the videos, I was impressed that every video had its own style and story. Every video was different. All the students had the same experience, but every student had a different set of “files” or previous knowledge to give context to their experience.
The sixth principle of media literacy says, “Media Literacy Education affirms that people use their individual skills, beliefs and experiences to construct their own meanings from media messages” (NAMLE, 2007, p. 1). This was evident in every video produced by the students. Each group produced a video that was representative of what that group felt was important and relevant. I know that most students were not capable of accurately expressing themselves through media, but this didn’t stop them from trying. Each group had something that set them apart. One group chose to create a fictional narrative that explained the importance of water clarity in rivers used by municipalities for drinking water and the cost of purifying water. Another group used a narrator who explained what they were trying to do with small musical montages between each step of the process. One group was so frustrated with the technology that they produced a video that had no creative elements. They might as well have stood in front of the class and told us what happened. I could tell they thought this was a great way of expressing themselves until they saw what other groups had done and then they were embarrassed with their own product. I really enjoyed my vantage point that allowed me to observe and coach students. I learned more about how these principles apply to my classroom and especially helped me understand how they can be applied in any subject.

What Are the Benefits and Drawbacks of Collaboration?

In this study, collaboration with the APES teacher was a great experience. We both were interested in getting the most out of the study. This is a key component of collaboration, commitment. Collaboration opened the door for me to explore media literacy outside my classroom. The collaboration had other unintended benefits the following year when several students who were in the media class signed up to take the APES class and some science
students took the media class. The student survey also reflected this when two different students mentioned they liked being exposed to a subject they would not normally take in school.

Collaboration was a great starting point for me to explore teaching media literacy across the curriculum, but if I am required to collaborate with every subject I will lose my own class identity. It is important for me to teach my class my subject. I am willing to collaborate with others to implement elements of media literacy in other subjects. The goal would be that other teachers would continue to include media literacy in their classrooms after the collaboration ends. There are several factors that will determine if media literacy is a permanent addition to this science class, one of them being the teacher himself. If Steele sees the value of media literacy in his classroom and has the knowledge and skills to teach it to students, I would expect it to continue. Steele admitted in the beginning that he was willing to learn, but was going to be relying on me to handle the media literacy part. Over time and with repeated practice Steele can develop his own application of media literacy principle in his classroom. This study was just the starting point and I will continue to use collaboration as a method of expanding media literacy beyond my own classroom.

How Can Media Production Be Used in APES Instruction?

With this study, media production was a key element in teaching media literacy. The production did require some expensive equipment that may not be available to all teachers, but some element of production is necessary. In this particular study I felt that most students didn’t see the value of what we were doing until the day we watched the video products. Only when we reflected upon the media production did we, as a group, understand the concept of message construction and interpretation. I call this the “a-ha” moment. It came after production during our
reflection of the whole process. If there had been no production element, this moment may not have happened. What production element is appropriate for a different classroom or subject will be determined by what technological resources are available. Production can be as complex as recording a video documentary with multiple cameras and computers or as simple as making movie posters out of paper and pictures from magazines.

**Improving Practice**

Based on my qualitative experience, media literacy is a very good strategy when you want students to make connections between what they see and hear in class with what they see, hear, and do outside the classroom. Because media literacy teaches the fundamental skills of analysis and critical thinking, it can be taught through a variety of texts like advertising, storytelling, persuasion, propaganda, and representations of race, sex, and politics. Media literacy can and does take on many forms that can be applied to any classroom and is what makes your classroom content applicable outside the classroom. Media literacy pedagogy provides leverage that today’s student needs outside your classroom. To discover if media literacy will benefit your classroom, start asking yourself, what are students doing outside of class that I can connect to in class? When you recognize this, you have a place to start. If we are to improve the practice of media literacy, we need more practitioners. The underlying theory of media literacy needs to be checked and refined and this is only done through practice and sharing of your experiences. Hopefully our experiences in this study can help contribute to the field of media literacy education.

**Going Forward from Here: Best Practices**

Looking at best practices for implementing media literacy across the curriculum was not
the focus of this study but it will be something I look at as I move forward with my own practice. Buckingham and the New London Group both describe general methods of how MLE can be incorporated into the classroom. This is because the specific strategies and methods and best practices for incorporating MLE in to any subject has to be determined on an individual level.

Can media literacy be taught across the curriculum? Principles of media literacy can be applied in a science classroom. With the right combination of teacher knowledge, experience, and resources the principles of media literacy should be incorporated across the curriculum. Starting with Buckingham’s broad conceptual and dynamic methods a teacher is free to use any combination of situated practice, overt instruction, critical framing, and transformed knowledge that they feel will best “help individuals of all ages develop the habits of inquiry and skills of expression that they need to be critical thinkers, effective communicators and active citizens in today’s world” (NAMLE, 2007, p. 1). For this study we used the conceptual method described by Buckingham with a combination of situated practice, overt instruction, and critical framing.

Hobbs (2010) said “People need the ability to access, analyze and engage in critical thinking about the array of messages they receive and send in order to make informed decisions about the everyday issues they face regarding health, work, politics and leisure” (p. vii). This is the heart of media literacy. Hobbs (2010) states, like many others before her, that in our media saturated culture, media literacy needs to be a more important factor in our education system. As part of this implementation Hobbs listed five issues that needed to be considered when introducing media literacy across the curriculum (Hobbs, 2010). Looking at our experience implementing media literacy in a science classroom I checked these five ideas against our experience.
Moving beyond a tool-oriented focus.

It is important to explore, learn, and incorporate different technologies as part of media literacy education, but it is not completely dependent upon technology. When Steele and I met for the first time to discuss this project, Steele wrote in his journal:

I was excited to try something new with my students. I have always wanted to try and do more activities and learning objectives using media and electronics. I have not had training. I think my students are going to be challenged in a different way. I hope that it will cause them to think differently and gain a better understanding of the concepts and objectives of the unit.

When I read that, I was grateful that I was working with someone who wanted to include technology, not for technology’s sake, but to help students think differently. Steele recognized that this was an opportunity to challenge his students to think about science from a new perspective. Steele said he had never had training on technology. This didn’t mean he didn’t know how to use a camera. Steele meant he had no training on how to use a camera as a learning tool in the classroom. It is important to join technology with skillful use of it to have the greatest impact.

Addressing risks associated with media.

Hobbs describes three issues of safety related to media and technology, content risks, conduct risks, and contact risks that need to be considered (Hobbs 2010). Safety in relation to the media literacy part of this project was not something that Steele and I discussed in our preparations. After reading the safety issues Hobbs described I realized there are things that
Expanding the concept of literacy.

Media literacy builds upon the traditional idea and meaning of literacy. According to the core principles of media literacy education (NAMLE, 2007), “Media Literacy Education expands the concept of literacy to include all forms of media” (p. 4). I wrote in my journal that, “Students recognized that the visuals and music affected the pace of the video.” The more elements in a video, like music or effects, the more complex the project is. I asked students to describe the videos and they said, “Complex or faster paced videos are better or a step up from the simpler or slow fact-based-only videos”. We discussed what elements they used to “read” the movie. Elements like music, images, and dialogue are used in combination to help tell the story. One of the professionally produced videos used dialogue with vocabulary words the media students had not heard before and showed video of an experiment they were not familiar with. They didn’t understand the content of the message but they did recognize the elements in the video.

Strengthening people’s capacity to assess.

Information today is everywhere and constantly trying to get our attention. Information overload can cause people to become lazy, inefficient, and impatient while searching for data. According to the National Association of Media Literacy Education (2007), “Media Literacy Education builds and reinforces skills for learners of all ages. Like print literacy, those skills necessitate integrated, interactive, and repeated practice” (p. 5). Throughout the study I was constantly questioning the students about their purpose, intended audience, and story. As we entered our last meeting together to watch our video products, I felt that most students had been doing what they were expected without thinking about the purpose of their videos. It was while
we watched their video products as a group and showed everyone the videos that the students began to analyze their own work.

One group focused on the data and the results. After watching the video, the group who created the video was talking amongst themselves and when I asked what they were talking about one of them said, “We didn’t tell you why the data was important, we never finished it.” They didn’t realize they had done this until they watched it with the group. There was one video that stood out as the best. When it finished playing the students threw out comments like, “OK!” and “WOW!” and “that was good”. When I asked them why, they commented on the flow of the information, the pace of the video, the song used, and when they used dialogue versus graphs or subtitles. As we critiqued it further, we found some flaws in the data presented but pointed out that at first we didn’t notice the problems with the data because of the way it was presented.

One group produced something completely different than all the other groups. Every other group took a documentary style and had a narrator tell the story, this group created a narrative. Their video was about a group of students who need a drink of water and then go on a journey to learn where their water comes from and how it goes from snow to drinking fountain. Students in the class laughed and said they liked it because it was entertaining. When Steele and I asked about the quality of the information they at first thought it was right, so we watched it again. The students immediately realized there were a lot of things that were left out. The student who edited the video justified his version because they wanted it to be entertaining but at the cost of information.

**Bringing news and current events into K–12 education.**

Traditional news sources like newspapers and TV news broadcasts are not often
MEDIA MEETS SCIENCE

consumed by today’s youth. But the news is a main source for political and economic information that is critical for our society to function and we need to get more of today’s youth versed at reading and writing the news formats. Media literacy education requires literacy to include all forms of media; active inquiry, critical thinking about the messages in the media, and repeated practice if it will be effective at helping people become active participants in the community. When incorporating media literacy into a classroom it can be easier if you build on knowledge the students already have. Once students have practiced the skills of analyzing media in school, they are prepared to use these skills outside the classroom on media they know how to analyze. Hobbs (2010) said when incorporating media literacy, “look for opportunities to bridge the activities outside and inside the classroom” (p. 31). This will create more opportunities for students to practice analyzing media.

When I used videos from YouTube as a way of getting students to visualize their own final projects I knew that I didn’t have to explain the source of the video. After screening the students’ final videos I asked them to compare them to the YouTube videos that were used as examples. I asked them to decide if they were the same or different, and asked them to decide what was better and why. One student observed that after watching the example videos he was sure he could make a better one. But when he watched his final video with the group, he thought his group’s video was boring too. He said he was surprised how much time his group spent on a boring video. Now he knows why so many boring videos are produced. He wished his group had tried to plan a better story. Only after watching and producing content did this student understand the time needed to produce content. I have seen this over and over in teaching. A student easily recognizes problems with others’ work but makes the same mistakes because they don’t know what it takes to do something different.
MEDIA MEETS SCIENCE

So why show news and current events in the classroom if students are going to just copy and commit the same mistakes that they see in the media? Because learning to read and write in the media is the same as anything we learn, it takes practice. One of the core principles of media literacy is ‘repeated practice’. We don’t teach a child to write without first getting them to recognize the shapes of the letters. We shouldn’t tell students to make media without helping them recognize the different elements used to tell a story through media. This is essential if we want everyone to be active participants in our culture.

Conclusion

The heart of my media classes is learning how to make emotional connections with an audience through story. This focus developed only after incorporating media literacy into my pedagogy. As I have explored the role of media literacy in my classroom and now in a science classroom I agree with what people are saying about the importance of media literacy education (Hobbs, 2010; Buckingham, 2003b; Kist, 2005) To be active and not passive members of our media saturated culture, everyone needs to be media literate. Through a combination of structure, pedagogy, and practice, media literacy can be taught across the curriculum.


Madden, MA: Blackwell Publishers.


MEDIA MEETS SCIENCE


http://www.macfound.org/site/c.lkLXJ8MQKrH/b.5796441/k.D62D/ReImagining_Learning_in_the_21st_Century.htm


http://www.kff.org/entmedia/upload/8010.pdf


http://www.blog.ted.com/2007/11/06/larry_lessig/


Williams, B. T. (2003, April). What they see is what we get: Television and middle school writers. *Journal of Adolescent & Adult Literacy* 46 (7), 546-554.


APPENDIX A

The New London Group Pedagogical Structure


- In situated practice students are exposed to and can create media products as the learning activity and assessment.
- Overt instruction is when the teacher directly provides the examples and the expectations for the students but allows students to form their own opinions.
- Critical framing allows students the freedom within set guidelines to access, analyze, and produce media.
- Transformed practice is when students learn about a text and then transfer that learning to another text by juxtaposition or applying it to a different social context (NLG, 2000; Chandler-Olcott & Mahar, 2003).
APPENDIX B

National Association for Media Literacy Education (NAMLE)

Core Principles of Media Literacy Education.

The purpose of media literacy education is to help individuals of all ages develop the habits of inquiry and skills of expression that they need to be critical thinkers, effective communicators and active citizens in today’s world.

- Media Literacy Education requires active inquiry and critical thinking about the messages we receive and create.
- Media Literacy Education expands the concept of literacy to include all forms of media.
- Media Literacy Education builds and reinforces skills for learners of all ages. Like print literacy, those skills necessitate integrated, interactive, and repeated practice.
- Media Literacy Education develops informed, reflective and engaged participants essential for a democratic society.
- Media Literacy Education recognizes that media are a part of culture and function as agents of socialization.
- Media Literacy Education affirms that people use their individual skills, beliefs and experiences to construct their own meanings from media messages.
APPENDIX C

Post-Activity Survey.

The purpose of the last few weeks in class was to explore the role of media education in core subject areas and explore the benefits of team teaching between subject areas. You have agreed to participate by returning a signed consent form. You are not required to complete this survey as part of your class grade.

What was your overall experience?

What was it like working with other students as a group?

What are your feelings about mixing the two classes to work together?

What worked well about this assignment?

What should be done differently next time?

What parts of the instruction were unclear, or needed more explanation?

Was there any part of this experience that made you feel uncomfortable?

Did this project enhance or distract from the regular classroom instruction?

What could the teachers have done better to help you be more successful?

In your opinion should teachers team-teach more often? __________ Why?

On a Scale of 1 – 10, please rate the following questions.

Overall how do you rate your own video Podcast?
Really Bad 1 2 3 4 5 6 7 8 9 10 Really Good

How well does your Podcast reflect your knowledge of the environmental science?
Not At All 1 2 3 4 5 6 7 8 9 10 Right On.

In your opinion how important is it that media be used to help teach science?
Not Important 1 2 3 4 5 6 7 8 9 10 Very Important

If you had access to equipment, would you create videos for other classes?
Never 1 2 3 4 5 6 7 8 9 10 Yes
APPENDIX D

Advanced Placement Environmental Science Lesson Plan

Laboratory and field experiences provide students with opportunities to:

- Learn and practice scientific methods,
- Observe nature in operation,
- Design experiments,
- Form and test hypotheses,
- Collect and analyze data,
- Interpret results, and
- Organize and communicate findings to others. (Goodwin, 2008, p. 6)

Unit Objectives:

- My class is going to use the instruments for water testing correctly.
- My class is going to teach the other class [media students] about water testing and how to use the instruments.
- My class is going to describe the results of the testing.
- My class is going to describe any differences between their expected results with their actual results.
- My class is going to teach the other class [media students] the implication of the results.

Strategies:

Day one:
Order the bus from transportation department. I will introduce the combined unit to my class and give a brief explanation of what we are going to do for the next 9 class periods (three weeks). We will put the class into groups.

Both classes will go on a field trip and do water testing in various areas around the county. Both classes will meet to view the video and brainstorm how to present the information to the rest of the students.

Day two:

We need to have the APES and MEDIA classes meet each other and become familiar with each others class. We will meet for the last 15 minutes of class and introduce each other.

Day three:

Mr. Brown will take time in his class to explain in more detail his expectation. APES class will be spending the class period learning how to use the water testing equipment and testing different controlled water samples.

Day four:

The two classes will get together and the APES class will teach the MEDIA class about water testing and give a brief explanation of how the equipment works and then do a few controlled water sample tests.

Day five:

The two classes will get together where the MEDIA class will teach the APES class about aspects of multimedia in presentations. They will come up with a plan of attack for the field trip.

Day six:

Field trip. We will leave at 7:45 and get back 2:15. We will go to five different sites and
test the water to see what changes take place as the water goes from Benny and Nebo Creeks and Spanish Fork River in the mountains to Utah Lake. We will test various aspects of water quality. (i.e. hardness, oxygen content, phosphates, clarity, nitrates, and stream flow) Each group of students will do the same test at each of the five sites. We will stop for lunch in Spanish Fork. The MEDIA students will film and assist, as the APES student will do the sampling. I will give a history of the area and Mr. Brown will help his students where needed. We will talk about the Thistle slide and why it happened has well as point out that the streams and river all come from three different sources. We will collect and record data to use when making presentations.

Day seven:

Download video and organize data. Put “story” board together.

Day eight:

APES and MEDIA students will spend this class talking about expectations vs. results and compile “story” board and final project.

Day nine:

Watch and enjoy everybody’s projects. Evaluate projects for content, accuracy, and presentation appeal, and then summarize results.

Assessment:

Both classes will meet together to watch each others presentations. At this time the instructors will evaluate the projects. APES will be responsible for scientific correctness and MEDIA for how well the “story” was told.
APPENDIX E

TV/Video Productions Lesson Plan

Standard: Students will produce various forms of media as related to the TV/Video production portfolio

Objective: Students will produce a video product, related to their school, that demonstrates their ability to plan, script, storyboard, shoot, edit, and publish. (Utah State Office of Education [USOE], 2009)

Recommendation: Students should work with a class, club, or other school group to produce a video product. This assignment is a capstone project and should demonstrate the student’s skills in video production.

Assessment: Students will need to screen final products for those involved.

Execution: As a class we will work with the Advanced Placement Environmental Science students to produce a 3-5 min video product. Students will have to demonstrate planning, shooting, editing, and publishing skills. This will be group work and students will need to practice proper social skills to accomplish their assignment in groups.

Students will screen final products to everyone involved and there will be a group discussion about the final products.
Vocabulary: Podcast, Client.

APPENDIX F

Dissolved Oxygen

Dialogue was recorded at school after the trip without a microphone. There was no music playing at any point (this was not required). Video quality was very poor and pixelated, the only group who had such poor video.

- Group member reads definition of dissolved oxygen (Slides 1-3).
- Shot of a location from trip (Slide 4).
- Group member describes that their samples were taken from different parts of the stream and in and around different types of vegetation in the water (Slide 5).
- Shot of the student taking water sample (Slide 6).
- Student gives location of lowest dissolved oxygen reading (Slide 7).
- Student gives location of highest dissolved oxygen reading (Slide 8).
- Shot of student using scientific instrument in the water (Slide 9).
- Disclaimer, after returning from the trip the group realized they did not calibrate the instrument correctly and therefore the readings were incorrect (Slides 10-12).
Dissolved Oxygen
APPENDIX G

Nitrate Levels

Dialogue was recorded on location with natural sound. Group chose to use music throughout and added it while editing the video. The video had the quickest pace of all the student productions. The bulk of the science data was presented in a screen full of scrolling text that lasted for almost fifteen seconds.

- Music playing in the background while text on screen (1-3).
- Quick paced photos of location and water testing with music in background (4-12).
- Music fades (13).
- Student described that they were testing nitrate levels, recorded on location without microphone so natural sound was very distracting (14).
- A very long body-of-text slowly crawled up the screen (15-16).
- Student describes what measurements were taken (17-18).
- Montage of still photo shots of location and instruments (19-21).
- Student described how to get a proper reading with the instruments (22-27).
- Student described what acceptable levels were and what their reading was and how they compared (28).
- Montage shots of instruments and location (29-34).
- Student explained results and what impact nitrate levels would have had if they were too high (35).
- Closing credits (36).
Nitrate Levels

Nitrate Levels... Exciting? YES!

Nitrate is a naturally occurring mineral found in soil, where it serves as a nutrient for plant life. However, high levels of nitrate in water can be harmful to aquatic life and can affect the health of humans who consume the water.

High nitrate levels in water can cause methemoglobinemia or blue baby syndrome, a condition where infants develop blue coloration of the skin.

It is important to monitor and control nitrate levels in water sources to ensure the health and safety of both humans and aquatic life.

Nitrate pollution can be minimized through proper agricultural practices, such as crop rotation, reduced tillage, and the use of cover crops.

Monitoring nitrate levels regularly is crucial to maintaining water quality and protecting public health.
Nitrate Levels Continued
APPENDIX H

The pH Scale

Dialogue recorded after trip, in the school without microphone and music in the background is very quiet. Students in the video began by addressing the camera directly and then switched to talking to each other in conversational style.

- Title screen (1).
- Students describe how to read the pH scale (2-4).
- Location shots (5-6)
- Students ask other group members what the pH means (7-8).
- Student describes the instruments that were used and how they kept track of the measurements (9-14).
- Students describe what they learned using the scientific equipment and listed results (15-17).
- Montage of footage with music (18-22).
- Group summarized the information and moved into closing credits (23-26).
pH Scale
pH Scale Continued
APPENDIX I

Stream Flow

This was the only group that experimented with graphics. They used a graphic template of water being poured from a pitcher. This group found a good balance between being entertaining and informational.

- Music began with titles introducing student names and title (1-4).
- Music faded as students introduced the members of the group and a description of what they studied on the field trip. Students measured flow rate in the river to determine the amount of water that was contained in the river at any given point (5)
- Black shot of title (6).
- Student described the activities (7)
- Shots of river with student voice-over describing what flow rate is and how that impacts things like groundwater, storage of water in lakes, and erosion (8-11).
- Boy explained again what measurements are related to seasonal changes like snow and melting rate and their impact on stream flow (12-19).
- Music returned for a few seconds as closing credits roll (20).
Stream Flow
Turbidity

This was the only group that took a narrative approach. The group never addressed the camera directly. They focused talking to each other about the science while they attempt to tell the story of the water from rain/snow to our houses.

- Introduction of students in group (1-3)
- Video went black, music faded in and we heard the student’s voice-over stating that they needed a drink of water because they were thirsty (4).
- Voice-over announced they went up the canyon for a drink of water but the water was dirty so they decided to test it for different particles in the water (5-6)
- Used a title screen to pose a question (7).
- Girl answered that turbidity is the measurement of the number of particles that need to be cleaned out of the water before it can be drunk (8-9).
- Montage shots of the activity (10-11)
- Different shots of where the water samples were taken (12-16).
- Black screen, voice-over asked the group why they didn’t just drink from their drinking fountain at the school? The students answered with ‘what a great idea’ (17).