

# Studies in Teaching 2012 Research Digest

*Action Research Projects  
Presented at Annual Research Forum*



**WAKE FOREST**  
UNIVERSITY

**Department of Education**

**Winston-Salem, NC  
June 29, 2012**

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# Studies in Teaching – 2012 Research Digest

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# **“Reading and Writing”: A Study Comparing the Strengths of Peer Review and Visible Author Writing Strategies**

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June 2012

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The National Center for History in the Schools (1996) advocates students be given the opportunity to create unique historical narratives and arguments to foster historical thinking; these include five components of historical thinking: chronological thinking, historical comprehension, historical analysis and interpretation, historical research capabilities, and historical issues- analysis and decision- making. Six essential concepts for understanding history include: establish historical significance, take historical perspectives, and understand the moral dimensions of history (Peck & Sexias, 2008). Writing assessment engages students with historical documents and encourages historical thinking; but this writing must be well integrated into curriculum (Peterson, 2007). Writing within social studies curriculum also elevates student thinking above basic reading comprehension and encourages the development of high level writing skills (Monte-Sano, 2011). Monte-Sano’s study argues that writing teaches reasoning and critical thinking skills vital for student success. But the current means to assess student writing do not allow students to fully express themselves, working with drafting only and leaving out planning, conferencing, revising, editing and proofreading, and publishing (Schuster, 2004). Within the classroom, there are many effective writing strategies, two of which are introductory first person narratives and peer review. Richard Paxton’s 2002 “Visible Authors” study examined the effect of first person narratives on students’ ability to connect reading with their original writing. Textbook readings are automatic for students, and they assume the information is factual and without opinion. When reading first person narratives, students see the author as a person, with opinions and open to criticism. Paxton discovered students working with first person narratives produced longer, more argumentative essays that demonstrated true engagement with the documents. Another writing strategy, peer review, was lauded as the direct reason behind increased student content building and critical thinking (Berridge, 2009). Peer review allows students to consider their own work through the lens of another student’s writing.

When students read multiple essays on a single topic, they develop alternative thinking approaches. Peer review also stimulates a community of learners, as long as individual responsibility and group incentives are present (Berridge, 2009). This study seeks to discover the strengths of both first person narrative and peer review writing strategies.

### Methodology

The participants came from an Honors United States History class in a suburban school district in the Southern United States. The class initially included twenty- two students, with one lost to attrition. Pseudonyms will be used to protect the anonymity of students.

The pretest was an at home essay from the Civil War, for which the students were given the assignment in class. They submitted a final draft to the teacher, and received assessment through the provided rubric.

Students wrote a paragraph analyzing the effectiveness of various political cartoons. The papers were then distributed to the student group and evaluated with a worksheet. Any student not participating only submitted the final draft of the essay, and he or she was not penalized for lack of participation.

To introduce imperialism, students were given a copy of “White Man’s Burden” by Rudyard Kipling, published in 1899. Students were asked to write a journal assignment, one paragraph, and answering teacher created questions. Students who chose not to participate in the research were required to complete the journal; however the data sources did not include their work.

At the close of the imperialism unit, students were asked to write a modern yellow journalism newspaper article. Students were given a handout, and the teacher provided a list of possible topics. Students were given one hour of a seventy-five minute class period to work.

Data were collected from student artifacts such as pretest assessments, prewriting forms, study assessments, and posttests. Observations were conducted during all components of the research study, but most importantly during peer review group activities. Data from student artifacts was collected in two categories: content knowledge and holistic writing ability.

### Results

#### *Numerical grades*

The Civil War letter was an at home assignment, and six students turned in their assignments late, which lowered the class percentile score. All students were present the day of

and successfully completed the journal entry. The posttest saw five students complete only the article and not the paragraph analysis.

Assignment	Raw Total value	Raw Average Score	Class percentile average
Pretest Civil War letter	100	81.5	81.5%
Peer Review Political Cartoon paragraph	75	65	86.6%
Visible Author journal entry	10	10	100%
Posttest yellow journalism article	40	35	87.5%

### *Content Knowledge Expression*

In the pretest Civil War letters, students expressed factual content knowledge through specific mentions of battles. Only two students strayed outside the required number of specific facts needed to receive full credit on the assignment. Two students designed their letters physically realistic to the time period by font choice or paper manipulation.

Through the peer review cartoon analysis, students decoded the cartoons, developed an opinion on their effectiveness, and then used peer review to make sure their arguments were well founded. Key terms used by the majority of students included monopoly, trusts, government, senators, and bureaucracy.

In regards to the visible author assignment, student factual content knowledge was minimal when evaluated by use of key terms. Many mentioned imperialism, or restated the name of the poem to improve arguments. No students referred to specific lines of the poem, although all had copies with them while writing.

Factual content knowledge expression in the posttest yellow journalism assignment was unique from the other elements of the study, because it referred to contemporary society instead of United States History content. Students frequently used the words “lie” and “false” to demonstrate the fabrication of truth characteristic of yellow journalism

### *Content Engagement*

The Civil War writing assignment fostered historical thinking because the students needed to examine individual beliefs about the war.. A few took on the role of family members

at home. One student, Angy (also a pseudonym), developed a female character disguised as a male to be able to fight in battle.

Content engagement in terms of the peer review assignment was best represented through consideration of the students' theses. Many students wrote theses that simply answered this primary question: "I think the photo of the US Senate surrounded by large trusts that look like aristocrats speaks volumes." Most students focused their paragraphs on giving specific factual evidence, opposed to true engagement and critical thinking.

Most students did not use outside examples in their journal entries, but they were able to consider the negative implications of imperialism: "If your country is poor Imperialism [sic] brings you wealth and jobs which your people need. On the other hand you lose your right to govern your own lives thanks to regulations and laws enacted upon you by the imperialistic government a half a world away." Angy wrote: "The burden of the white man has changed. It used to be Manifest Destiny and having his slaves behave. Now in these days, men want money and life." She followed this statement asserting the negative impact of imperialism, and the idea of continuing American imperialism, although without the negative label.

Content knowledge engagement expressed in the posttest assignment refers not to contemporary knowledge, but to comprehension of the concept of yellow journalism, and student ability to apply it to modern situations

Nick wrote about the creation of South Sudan, while it was evident he only knew basic information. He did not make any outrageous claims, a hallmark of yellow journalism, but instead worked within the realm of the South Sudanese liberation from oppression. My's story title was meant to enrage readers, "KKK hits the Streets!!!", when in fact her story was about the relationship between Kim Kardashian and Kanye West. She wrote in her analysis: "when readers first look at it, they will think that the article is about the Ku Klux Klan coming to power." Although Thomas' article itself was not inflammatory, the picture depicted a sketch of the United States with a target on it, while Kim Jong Un laughed in the background. Houston tapped into the media frenzy associated with the anniversary of the sinking of the *Titanic* by fabricating evidence blaming the Japanese for sinking the vessel.

#### *Holistic Writing Ability*

The pretest Civil War letter assignment showed students' grasp of grammar and spelling. All students wrote their letters in first person, which was the intended perspective of the



assignment. During the peer review writing session, students were extremely supportive of their classmates' work. The peer review worksheet specifically asked students to consider the spelling and grammar of their peers. John was correcting Houston's work, and identified the misspelling of "adequately" as "adequetly". John did not provide a correct spelling of the word, just circling the word and writing "sp" above it. Houston did not correct the word in his final paragraph, leaving the word spelled as he did in his draft.

Students were given total control over the voice used in the visible author journal entry. Students consistently opened their journal entries with "I believe" or "My thoughts". Some students continued their argument by incorporating second person into the writing. Students who moved through the prompt questions to those about the meaning of the poem used third person more often, because their subjects were outside terms such as imperialism or the poem itself. Because of the draft nature of this journal entry, and a grading focus on content completion not writing ability, there were many spelling and punctuation mistakes. Many students were unsure about the proper delineation of the poem title, not putting it in quotation marks at all. John did have a grasp on spelling, correctly spelling "factories", "Imperialism", and "hypocritical". Multiple students capitalized imperialism throughout their paragraphs, mistaking it for a proper noun.

Both writing strategies encouraged students to interact with the historical concepts and source material provided to formulate original thought and exhibit historical reasoning.

### Discussion

The peer review strategy increased student input by allowing them the chance to analyze their peers' writing. The visible author strategy had a greater impact on content knowledge expression than the peer review exercise.

The strengths of peer review and the Visible Author writing strategies were ones asserted by studies concerned with writing in the social studies classroom. Writing in the social studies classroom encourages deeper thought about history (Peterson 2007). Writing is a method to teach historical reasoning skills. (Monte-Sano, 2010). Finally, the decision to provide assessment grades based on completion encouraged students to develop their reasoning and arguments through the writing (Wiggins, 1990).

This study did not have the same successes as Berridge's 2009 study on peer review. Students in this study did consider their work through the lens of their peers' work, but they were

more focused on grammatical and stylistic improvements. Within the realm of the social studies classroom, the Visible Author writing strategy encouraged skills necessary for social studies success. This knowledge transformation moved the debate about “which story to tell,” as discussed by Peck and Sexias (2008), into the classroom (p. 1017).

### Conclusion

Studies and contemporary teaching practices have developed many methods of writing instruction, of which peer review and Visible Authors are two of the most useful. Having the unique opportunity as a social studies teacher, I will rely heavily on Visible Author texts to introduce and inform students about historical concepts.

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# **Project Based Learning: Is this New Method an Effective Educational Approach to Learning?**

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June 2012

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The academic freedom of teachers has been impinged because of the recent move towards high stakes testing (NCSS, 2007). Academic freedom is defined as a social studies teacher's right and responsibility to study, investigate, present, interpret, discuss, and debate relevant facts, issues, and ideas in the fields of a teacher's competence (NCSS, 2007). Academic freedom allows students to follow these same principles. The importance of academic freedom is that it allows teachers to openly discuss ideas and values in our society and other countries, which helps to educate students. Having an educated population helps to maintain a democratic society because the population is able to make informed decisions (NCSS, 2007). Therefore, the impingement of academic freedom on students and teachers hinders the quality of instruction. One method social studies teachers are using to combat these constraints is by making learning more active (NCSS, 2009). Student-centered teaching can help prompt a greater interest in school because students will be self-directing their learning, which means they will probably be learning something they are most interested in. A type of learning approach, constructivism, shifts the locus of control away from the teacher so the teacher becomes more of a guide that shapes the learning activities and the structure in which they occur (Anderson & Dron, 2011). Constructivist learning acknowledges the creation of knowledge in the minds of learners (Anderson & Dron, 2011). Teachers are not transmitting information to passive learners, but rather each student is constructing knowledge from their pre-existing knowledge and the new information presented (Anderson & Dron, 2011). The more actively involved students are in the learning process will help students retain the information better because they can identify a connection between the content and their own experiences. The self-direction for learning that constructivism allows can make it a more useful learning tool for students.

Students are more receptive to constructivist learning because students act as the active builders of learning, whereas objective learning is when teachers expect students to be the

passive recipients of information (Kinchin, 2004). The objective approach diminishes student interest in academic subjects because they feel low expectations are placed on their ability to formulate thoughts (Kinchin, 2004). Constructivism emphasizes independent learning and allowing the student to take greater ownership of their learning because the teacher becomes a facilitator of student questions (Bodner,1986). Students will not be learning information they have already grasped, but they will be expanding their knowledge by exploring concepts in greater depth because constructivist principles emphasize the importance of a two-directional flow of information between teachers and students (Bodner,1986). A dialogue is created between the teacher and students, whereby the teacher is asking questions, forcing students to explain their answers, not allowing students to state theories without explaining them, compelling students to focus on word choice, and encouraging students to reflect on their knowledge (Bodner, 1986).

A method that is being explored is project based learning (PBL). Project based learning allows students to demonstrate the necessary skills while also being an independent learner that is able to investigate a specialized area of interest (Scappini, 2004). Project based learning is a teaching method designed to engage students in the investigation of original problems (Blumenfeld et al, 1991). Students will develop many skills, such as collecting data, how to research effectively, deciphering credible information, and making conclusions with the results. PBL is not a hindrance to learning, but rather an opportunity for students to explore the same information in a different context. PBL is perceived to be challenging because assumptions are made about the amount of research involved, but in reality the scope of research is dependent upon the purpose of the lesson. PBL gives students a tangible example of what they are studying and it allows them to study the content from many perspectives. Thus, not all PBL lessons have to be semester long research projects, instead they can be shorter lessons that still help students grasp the content in depth and develop important skill. Using PBL in the classroom can create a more personalized experience for students and follows the trend of the constructivist approach.

Project based learning can be an effective means for students to achieve the goals of constructivist and inquiry based learning. PBL allows students to collaborate with each other to generate a deeper understanding of problems, which they find to be relevant in learning (Goodnough, 2006). The student-centered approach makes learning more practical for students, which illustrates the importance of personalized learning, a cornerstone of PBL. The self-

directed learning students undertake while using the PBL method improves student motivation because students are investigating issues that arise from their own interest.

The research in this study will examine how project based learning helps students to engage with social studies content, and its impact upon achievement. History is sometimes alluded to as a boring subject because students do not see the relevance to their lives. However, with a student-centered approach that emphasizes self-directing students' own learning, history can instead be a fascinating subject. The research that has been gathered thus far looks at how PBL is a better method of instruction, but not commonly used by teachers. Also, evidence has shown how PBL increases student engagement, but there has been little evidence to illustrate how PBL influences student achievement. PBL should not be a method used when teachers have extra time, but it should be used constantly because research has shown that students are more engaged and motivated to learn using a student-centered approach. This study will focus on engagement, but also achievement because it would seem that students will retain more information in content they are most interested in studying. Thus, they will achieve more in their assessments because they will not have to struggle through learning the material because they will already have a firm grasp of the content. This is the importance of my study, because I will be examining how student engagement in the classroom, as a result of using PBL, will personalize the student experience and directly affect student engagement and achievement. Specifically, the research question for this project is how does project based learning personalize the student experience in regards to engagement and achievement in social studies.

## **Methodology**

The design of the methods used to carry out the research project will follow a specific procedure. During a specific unit during the course, students will identify a theme they are most interested in exploring. The students need a specific research question, such as how the passage of the Civil Rights Act of 1964 change the lives of low income blacks living in urban cities in the South .Once students have identified their topic of choice, they will find three to five people who meet the criteria for their topic. Students will then derive ten to fifteen interview questions. These questions should consist of basic background information, but they should also delve into their research question. The purpose is for the student to learn from the perspective of someone living in that era what their life was like. Additionally, the students will learn how their experiences fit into the overall framework of the content we are covering in class. After students

have derived questions, they will conduct interviews with their selected people. At the conclusion of the interview, students will write a paper that summarizes the interview, connects all of the interviews together, such as similarities, differences, or interesting findings. Finally, the paper should answer how their experiences are pertinent to what we are learning in class and what students learned from the interview.

In order to successfully analyze and interpret my findings, I will observe the behavior of my students through their class participation and when analyzing video footage of our class. I will use grounded theory to justify my findings using the observation method. Grounded theory states that theory is derived from the data, systematically gathered, and analyzed through the research process (Corbin & Strauss, 1996). Grounded theory justifies the results I find from my data because I am formulating a conclusion based off observations I have gathered during my research process. I will also use theoretical comparison to justify comparing student participation. Theoretical comparisons use the properties and dimensions to examine the data (Corbin & Strauss, 1996). Therefore, I can analyze the data objectively without having to classify the specific incidents that occurred. This will help me to formulate my own scale of active participation through my observations and observations derived from using theoretical comparisons will give meaning to the data, which will help to interpret and validate my results (Corbin & Strauss, 1996).

## **Results**

The results of my action research illustrated that different types of students generated different outcomes. I conducted my research with my class of twenty civics and economics honors students. Students were asked to research a topic of their choosing that related to a legal right or responsibility. Students had to interview three to five people with questions that related to their topic. Students could present their findings in any medium. The flexibility of the assignment allowed students to study topics that interested them. Since this assignment relies on student initiative and willingness to produce a good product, I found that three types of students emerged. I will categorize the class into three types of student groups. Group A has four students, who could be described as unmotivated and attain poor grades. Group B has six students whose grades fluctuate and they don't always participate in class. Group C has seven students who have high grades, are highly motivated, enjoy projects and puts lots of effort into their coursework. Characteristics of the entire group may not all be applicable to describe the

student, but the student shows at least one characteristic that truly defines the nature of the student.

In general, the students enjoyed picking a topic they were interested in researching. The work on their projects illustrated that they may not have been interested in the topics, but wanted to do something they believed was easy. Obviously I would have preferred if the students had picked topics that really fascinated them and sparked a curiosity that would want to grapple with the content in greater depth. Considering these are 10<sup>th</sup> grade students, many of them may not have the aptitude, or fortitude to do a self-driven project. With that being said, a few students picked topics that they were clearly passionate about learning. Students presented their findings in papers, posters, or PowerPoint presentations. The varying levels of effort contributed to the outcomes of the project, which could also be seen in student activity during class.

### **Discussion**

This study demonstrates that problem based learning is an effective method to increasing student motivation and learning through self-directed projects. Students were assigned an open-ended project where they could pick any topic of their choosing, interview three to five people, and then compile their data in a unique presentation that relays their findings and what they learned. In analyzing my results I was able to divide my class into three distinct groups. The quality of presentations, student grades, student involvement in class, and their enthusiasm for the project were all factors in creating the three distinct groups. Overall, student projects were done well and most students seemed to gain something positive from the projects. However, I believe certain students gained more because of their prior work ethic, or students who had not been offered the opportunity to research of their choosing were able to explore topics of their interest. Some students, who are typically disengaged or lack the motivation to do a self-directed project did not commit themselves to the project as much as I would have liked. This illustrates that problem-based learning does spark creative ingenuity in some students, but other students do not find school interesting in any capacity. I would infer that these students have not developed a love for learning, thus lacking the motivational skills it would require to complete a project of this magnitude.

My findings illustrate the usefulness project based learning has in concentrating teaching into a more student-centered approach. Blumenfeld (1991) argues that students will develop a variety of skills, such as collecting data, effective research, and making conclusions with their

results. Through the course of the project students were required to collect data, conduct background research on their topic, and make conclusions from their results. The final project is a testament to student development of these skills because their projects depicted how well they were able to collect data, analyze results, and decipher quality research sites from others. Not all students mastered these skills, but the initial phases of development began through this project, and they will likely continue to enhance as learning becomes more student-centered.

## Conclusion

Project based learning personalized the learning experience for my students and increased their engagement in class. I cannot specifically say it increased their achievement levels, but their projects increased their engagement because students were enthusiastic and developed great projects. Independent learning is not an easy task since students are accustomed to teacher-centered learning, but I believe this project helped students gain valuable skills that they are able to use in all disciplines. Project based learning is redefining education in our society, and I believe this project illustrates the positive outcomes project based learning provides for students.

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## **Building a Sense of Community in a High School Physics Class**

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June 2012

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It was the goal of this study to see if using praise and encouragement strengthened the sense of community in a physics classroom. In order to motivate students, it is critical that teachers establish a safe and respectful environment. In this study, I sought to discover the impacts of building a sense of community in the classroom. Strategies geared for establishing the sense of community in the classroom included establishing an environment of mutual respect, providing encouragement, and collaborative group work.

### **Background Literature**

In order to build a sense of community in the classroom, it is necessary for the teacher-student relationship to reflect that of one built on mutual respect. This mutual respect can cause students increased comfort level in the classroom. Another means for increasing student comfort level in the classroom would be to alter the perception that science cannot be disputed. In fact, it is the goal of most scientists to look for evidence that changes current perception, rather than confirm the principles. Richard and Bader (2010) assert that students fail to realize that science is a field open to controversy. Rather, students submit to experts with regards to science concepts. It was the goal of this action research to see if a respectful environment made students more likely to engage in scientific discourse within the context of the social classroom.

While striving to establish an environment rich in mutual respect, teacher should simultaneously as role models and leaders in the classroom. Since Lev Vygotsky in the 1970s, educational researchers and psychologists alike have been studying learning through social interactions. Teachers and students should learn from interacting with each other, which can be achieved in an environment built on mutual respect. Since a person's internal processes (e.g. thinking, learning, and language) stem from interactions with other people (Vygotsky, 1978), teachers should act as role models by building language and encouraging social interactions. Sternberg and Williams (2010) suggest that if such an environment is established, students will learn (in this case physics) together. The establishment of an environment built on respect where

students and teachers can work together towards a common goal can also enhance the sense of community in the classroom.

With a strong sense of community in the classroom, it is likely that students will be more inclined to participate in the learning process with one another. Learning with and from one another can be a rewarding experience for all. Many have suggested promising outcomes of cooperative learning activities (Johnson & Johnson, 1987; Battistich, Soloman, & Delucchi, 1993; Lemus, Bishop, & Walters, 2010; Richard & Bader, 2010; Saliwanchik-Brown, 2005; Vygotsky, 1978) such as positive social attitudes, prosocial behavior, and peer support. For example Lemus, Bishop, and Walters claim “learning in a team is more interesting and easier” (2001, p.49). Their research investigated the effects of working in small, cooperative groups. They found working in small groups makes students more comfortable voicing their own opinions. This resulted in an increase in the level of discussion (Lemus, Bishop, & Walters, 2001). Students need to be given a chance to create. When they have control, and are not concerned with the authority of the teacher, they will be more motivated to learn science. Lemus, Bishop, and Walters (2001) also found that the science learning was deeper and richer through the group work aspect.

### **Purpose**

Given the promising research on environments of care and respect leading to increased motivation to learn, in this study I explored instructional practices that build a sense of community and their subsequent impact on students’ motivation to learn physics. Right now, most emphasis is put on student engagement in an *established* classroom community. This study examined both the process and outcomes of *building* a classroom community. This study sought to show how praise and encouragement, through teamwork in small and large group settings, increased motivation in the physics classroom.

### **Research Question**

How does encouragement in cooperative learning groups affect students’ sense of community in a physics classroom?

### **Context**

The subjects were twenty-five high school physics students from a public high school in a suburban school district in the southeastern United States. The participants were chosen according to my assignment during a student teaching experience in the spring of 2012. The

class was a semester long Honors Physics course. The data, collected over a two week period, was only used from those students who gave their assent and whose parents consented for them to participate in this study.

## **Methods**

I created randomly assigned groups by giving each student a number and using a random number generator. I used the Modeling Instruction method. This method required students to work together in solving real world problems. It also produced students who engaged in scientific discussion with one another (Jackson, J., Dukerich, L., & Hestenes, D., 2008). The study took place during a unit on work, energy, and power. The students, working together in their collaborative groups, had an opportunity to solve real life problems, display their work on whiteboards, and communicate their ideas. The students presented their work as well as critiqued their classmates work. This type of modeling and sharing increased student discourse. Throughout presentations, students applauded one another for fixing mistakes and for presenting the material. I also offered praise and encouragement for those students participating in the modeling activities.

The study encompassed four data sources: a pre-survey, video observation, a post-survey, and interviews. All students were invited to participate in observations and surveys. Three students were randomly selected and invited to participate in follow-up interviews to elaborate on their responses to surveys. All students' names are protected through the use of pseudonyms in order to ensure participant anonymity.

## **Results and Discussion**

The survey data indicate that many students felt there was a sense of community in the classroom. There were twelve instances on the pre-survey and fourteen instances on the post-survey where students expressed why they felt a sense of community in the classroom. One student aptly explained, "I believe some people think that others' learning is important because they help. Not all do," (Su.post). Seven students were not as confident that such a community existed in the class. One student wrote, "I honestly don't care about their grades. The ones that have bad grades don't put in the effort" (ST.pre) That student also wrote, "I'll help them if they need it but I don't worry about them."

Table 1

*Pre and Post-survey Changes*

Survey Question Number	Pre-survey mode (n=25)	Post-survey mode (n=24)	p-value
1	2	2	1.00
2	2	2	0.16
3	3	3	0.77
4	4	4	0.40
5	2	2	0.83
6	3	4	0.76
7	1	2	0.06
8	1	2	0.02
9	1	2	0.30
10	2	2	0.40
11	2	2	0.23
12	3	2	0.31
13	3	2	0.38

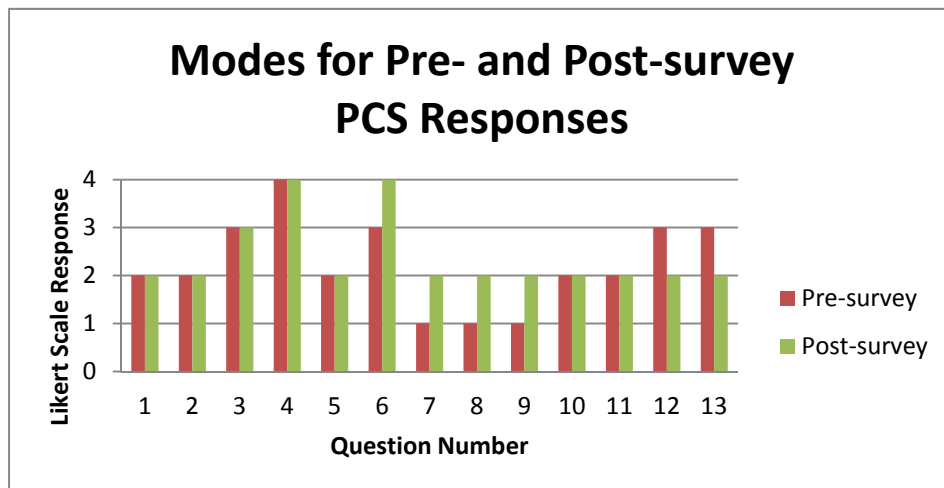


Figure 1. Modes for Pre- and Post-survey (Physics Community Survey) Responses

They number of positive responses for a sense of community in the classroom increased for Question 13 on the Post-survey. Fourteen of the nineteen free-response answers to Question 13 on the Post-survey indicated the students felt a sense of community in the classroom. Five students did not indicate they felt a strong sense of community and five students did not answer.

Some students felt like there was already a sense of community in their classroom. Some even went as far as to say, “We try to help each other if someone is having a problem understanding something,” (Sm.post) or “We want each other to pass and be prosperous,” (So.post). Yet other students did not have the same feeling. One student stated, “I don’t really know most of the class,” (Sa.post), and another stated, “Some people have a general lack of concern from being in this class or at school,” (Se.post).

Questions 7, 8, and 9 all had to do with motivating and providing students with encouragement. These three questions also included explanation sections. The mode went 1 to 2 for questions 7 which stated, “My physics teacher motivates me to learn physics.” The p-value for question 7 was 0.06 which is not significant at the  $\alpha = 0.05$  level. Question 8 asked about the physics teacher caring about the student learning. The response mode for question 8 experienced a jump from 1 to 2, and a p-value of 0.02 which is a significant change. Question 9, “My physics teacher provides encouragement,” also showed a change between Pre- and Post-survey results with an increase of from 1 to 2 and a p-value of .30 which is not significant.

Several students even went so far as saying that they felt like family. One student (SN.pre) in response to question 13 indicated that she felt like “one big family” because “everyone gets along.” Another student (Sk.post) said he felt like they were a like a family because “[they] all work together.” Most students wrote about helping one another. On the Post-Survey there were six quotes that specifically mentioned “help.” The students genuinely care about how others are doing in class and want to make sure that their classmates can succeed. A different student (Su.post) who did not mention helping others stated, “I believe that some people think that others’ learning is important,” and another (So.post) mentioned that “we all want each other to pass and be prosperous.” This indication is that the students sincerely care about the well-being of one another and of the class as a whole.

Students can learn by talking with one another. It is imperative that a teacher give students plenty of time to discuss different topics so that students are exposed to multiple ways of thinking about a subject. In this case, students learned about work, energy, and power - words that are often used but with various intentions. When students learn as a team it can be more interesting and often easier than when they try to learn on their own (Lemus, Bishop, & Walters, 2001). The students had a chance to work together on assignments which helped them to understand the concepts better. Just as Battistich, Solomon, and Delucchi found in their 1993

study, this study found that pro-social values and encouragement of cooperation reflected the students' positive sense of community.

### **Conclusion and Looking Ahead**

This study showed that building a sense of community in a physics classroom can be achieved through group work and student collaboration. It is important that teachers encourage group collaboration and establish an environment of care and respect among the students in their class. In the future, a study may seek to compare individual student work with collaborative group work.

This study confirms that when an environment is established where the students care about one another and the teacher encourages the students to work with one another then real social learning can take place. Further research should be put into courses and classroom environments where traditional group work is less common and where students do not have a chance to collaborate with their peers.

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## **Seeing Double: Visual Media and Expanding Definitions of Literacy in the English Classroom**

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*June 2012*

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In our increasingly digital and technological age, definitions of literacy are expanding and changing due to the influence of media in popular culture. It is within the English classroom that such a paradigm shift can be felt the most, influencing the way educators approach teaching the skills and competencies necessary to recognize and understand the rhetoric we are confronted with on a daily basis (Krueger & Christel 2001). According to Postman (1985), visual media is reshaping our culture in both subtle and dramatic ways, influencing the way we understand, talk about and critique the messages that surround us. Media literacy in the context of the language arts is a critical junction that is becoming gradually more apparent in the pedagogical approaches of today's English educators. In many ways, this encourages incorporating visual media into the English classroom as a tool to engage this new literacy, engaging students with it in a way that doesn't merely make us consumers of visual texts, but interpreters as well (Milner, Milner & Mitchell, 2012). Hobbs (2007) acknowledges this reality, arguing that English as a discipline has become largely influenced by a convergence of the fields of communication, media studies, and literary studies, requiring teachers to confront broader definitions of literacy that incorporate the new information media dominant in our society today.

Contemporary research has shown that regular incorporation of visual media into the English classroom can help with developing multiple types of literacy (Seglem and Witte, 2009; Hobbs, 2004), but not all research has found effective and intentional use of visual media in the classroom, particularly in relation to film (Maynard, 1971). Hobbs (2006) expands on the findings of these researchers, reflecting that "teachers in the USA report that their colleagues frequently use media for non-educational purposes, including filling time, to keep students quiet, as a break from learning, or as a reward for good behavior" (p. 35). In an effort to view the possible consequences of these practices considering renewed interest in integrating media literacy into K-12 instruction, Hobbs surveyed the way educators used visual media in the

classroom. She found that educators who identified the value of videotape or print media as “a means to start discussion or stimulate student writing were infrequent, representing only 6% of the sample” (p. 46). Bergoray’s (2001) research complements Hobbs’, finding that issues such as “coping with student attitudes, lack of time, and...general ambivalence about implementation” all affected the use of visual media within the classrooms of surveyed English educators (p. 1). Despite this challenge, after a year of study Bergoray was able to identify more than 70 different approaches to viewing and representing visual media in the classroom, with many teachers reporting that utilizing media in lessons seemed to positively influence student learning and their ability to assess that learning.

Building specifically on the research pertaining to the placement and use of visual media in the English classroom, I hoped to explore how the use of visual media to supplement a literary text affects student engagement in the study of that work. By using visual media as a complementary tool, I hoped to use the potential of recognizing students as digital natives to inform my own practices in the classroom, challenging them to connect with a visual text as a mode to further the study of the literary text they were currently reading.

## **METHODOLOGY**

As a student teacher, I was in a unique position to adapt my pedagogical approaches to using digital media in the classroom and study its influence and effects on my students. Building on this potential for pedagogical reflection, this study was conceptualized as action research, expanding on the specific ways I teach and my students learn. The study took place in Mount Tabor High School, a secondary public school of approximately 1600 students in the Winston-Salem/Forsyth County School district. Only students currently enrolled in my English II Seminar course spring semester were eligible for participation. The exercises involved in this study occurred in the context of regular classroom instruction and student participation was completely voluntary. Students who assented to the study were representative of a heterogeneous group with regards to gender, race and academic ability. The class consisted of twenty three students whom I taught over the span of six consecutive weeks. Seminar English was academically rigorous and instruction was modeled around a pre-advanced placement curriculum. Enrollment in the course was through teacher recommendation and parent consent, with the ability level and work ethic of the students in the class covering a wide spectrum of learners.



The instruction informing this study involved exposing students to a visual media text before asking them to engage in analysis about the actual literary text they were currently studying. These visuals were thematically or historically related to the literary text they were reading at the time and were intentionally selected by the instructor beforehand to enhance the study of this literature. Examples of visual media used over the course of the study included images, pieces of art, television clips, photographs and short video clips. In an effort to explore existing student attitudes toward visual media and their experiences analyzing it, participants in the study were given a pre-survey and post survey after instruction. Similar to the research goals explored by Hobbs (2006) concerning the variety and frequency of media use in the classroom, these instruments were used by the researcher to establish participants' previous experiences with media and any preconceived notions about its use in the English classroom, as well as analyze any changes. Surveys asked students to reflect on their attitudes toward literary texts as well as the use and study of visual media as a supplemental tool for studying literature. With the information collected from these instruments, I was able to gauge any change over the course of my study pertaining to how students have been asked to analyze media in the past and measure what kind of attitude they have about a variety of texts used in my lessons.

After students encountered the media, they were asked to complete a journal activity to reflect on their interaction with the visual text. This journal assignment was designed by a class consensus of what students wanted to discuss about the media, and was also partially informed by the five core concepts of media literacy designed by Thoman & Jolls (2005). Modeling the journal assignment after this research, I asked students to reflect on the following ideas in their media journal before discussing the visual: What is a main message being conveyed? Who is the intended audience? What methods are used by the artist/director to express this message? And can you identify the possible intent of the visual text? Participants were asked to apply these concepts to each visual text they studied. After the writing activity, they were then asked to share their opinions with classmates in small groups and then in whole class discussion.

## **RESULTS**

In an effort to measure students' approaches to visual media, answers to the pre survey responses were averaged to determine the exposure and use of visuals in students' previous English classrooms. Responses to the questions were given on a Likert scale, with a score of 1

being strongly disagree and 5 being strongly agree. Out of twenty three students, on average most agreed that they had been exposed to visual media in the language arts classroom in the past. It was also determined that most self-identified as benefiting from improved comprehension of a text if they used a visual text as complement. Despite such an opinion, most agreed that teachers in the past had only used media as a learning tool once the literary text had been discussed first. Independent of this placement, students believed they had still been asked to analyze it in a similar way they were asked to analyze a text.

Once pre surveys had been examined and previous experience had been established, student response journals were coded in an effort to determine what particular approaches were favored by students in discussing visual media, and if such reflection changed over our instructional time together. Response journals were coded based on three themes, focusing on whether students had chosen to mainly discuss the media's: formal qualities, purpose/theme, or relation to literature. When students first started journaling about media during our *Siddhartha* unit, the majority of entries pertained to formal qualities of the work. Sixty percent of the ninety two journals that were coded dealt with students writing about or describing what creative choices the artist made. Only twenty seven percent were about a larger theme of the work, and only thirteen actually made an explicit connection to the text. In comparison, the second unit on *Night* did not see a vast change in this number. Students still wrote about the formal qualities of the media a majority of the time. Fifty five percent of all entries written by students dealt with this aspect of the works we were studying. In general, this trend did not decline a substantial amount over our two units.

After finishing our study of *Siddhartha* and *Night*, students answered a post survey asking them to reflect on their experience. This survey was designed in a similar way to the one they filled out initially, asking them to rate their responses on a Likert scale. According to the averages reported in these reflections, students agreed that looking at media in conjunction with a text complemented our study, and that in general, the media selected was approbatory to the text they were reading at the time. Averages were more neutral in other areas. Students as a whole agreed that it helped to have a supplementary text to compare to when discussing a larger work, and that in general it made them more excited or motivated to think about literature. As far as opinions on whether discussing visual media or literature was preferred, the class was largely neutral. Students rated their overall experience with visual media on a Likert scale from one to

five. Ten out of twenty three students rated our media studies as an overall positive experience with a score of five. Eight rated it a four. As a whole these numbers show that the students enjoyed the process and would have liked to continue media studies in the future.

In an effort to get a more complete understanding of student interactions with the media, I examined their journal entries and the video recorded lessons to compare to the scores reported in the surveys. In general, the quantitative data showed that on average students felt more comfortable discussing the formal qualities of the media in their writing. However, it was my experience as their teacher, that the more we discussed the media as a class, the easier it was for students to vocalize their opinions on the work in relation to the text. In my field notes for our class discussion on April 12<sup>th</sup>, I wrote that during our initial discussions of what the class felt like we could identify as a text, most “felt like a piece of media could not function as a text because it lacked explicit textual writing.” When students were prompted by me to view media as a platform for expression that could “share a similar thematic message...most felt like art or media was to be viewed in a more obscure and subjective manner and didn’t necessarily need to be viewed as a text.”

After reviewing multiple recorded lessons, I came to the conclusion that students felt comfortable discussing the formal qualities of the media because it required less analysis. When I would pose a question to the class comparing the media to our text, many would volunteer, but such conversation developed out of our discussion rather than their personal reflection. When reading the journals, I also determined that the type of media being discussed helped determine the approach students took to writing about it. When looking at a painted or sculpted piece, students showed a tendency to talk about the aesthetic nature of the work because it was easily observable. In contrast, when looking at a movie or video clip, students were more motivated to form literary connections or discuss theme because the formal qualities were less apparent (they may have lacked the vocabulary necessary to talk about lighting or framing for example). In comparing student entries, a reader can see a trend that I noticed in a majority of student responses. Most approached discussing media that may be traditionally considered visual art in a different way than they did discussing performing art.

## **CONCLUSION**

Through my action research, I desired to complicate the place of media in my instructional design in an effort to increase awareness of our role as audiences and participants in

this culture of mass and varied communication. What I discovered through my research is that students have an inherent level of comfort with media that their educators recognize and are embracing. However, that reality isn't being translated into the way students may traditionally develop their own understanding of what it means to be a literate thinker. When asked to analyze or discuss media in a way that may reflect critical interpretation, the students in my course showed that they have traditionally been passive in their reception of media, a reality that became apparent in the ways they wrote and personally reflected on it. This tendency was complicated when considering the way media was used as a springboard to both complement and supplement the discussions occurring within my classroom. When it came to adopting the skills used to identify formal qualities, audience, purpose, and theme, students proved they were able to translate such skills to media, but they questioned the concept of approaching said media as text. When considering the future of media studies within my own classroom and the larger language arts discipline as a whole, I believe that educators need to continue challenging students to examine the evolving modes of expression around them, modeling and encouraging the skills necessary to value and challenge the varied expressions and mediums used to convey knowledge in our technological and digital world.

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## **Improving Student Attitudes towards Science through Scientific Module Instruction**

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June 2012

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Increasing scientific literacy by promoting students who can participate in discussions about science, raise questions about scientific matters and make evidence-based conclusions about the world as a whole, is quickly becoming a top goal of scientific education (Klop, Severiens, Knippels, van Mil & Ten Dam 2010; OECD, 2006). In addition to declining scores for scientific literacy in the U.S., the number of students pursuing scientific careers is also declining (Burnsed, 2011). Decreased interest in science is in stark contrast to a steadily increasing demand for highly trained scientists. In a recent study, forty-nine percent of high school students reported that they were unlikely to pursue a career in science (Burnsed, 2011). Of students who are pursuing scientific degrees in college, seventy-eight percent of respondents reported deciding to pursue science in high school or earlier (Microsoft, 2011), highlighting the importance of piquing and maintain interest early in school years. As baby boomers prepare to retire and careers evolve to rely on science and technology, employers are turning to recruitment outside of the United States to meet their needs. With economic concerns in the United States at an all-time high, focusing on increasing attitudes towards science in young people is a crucial priority.

Motivation and interest (in addition to beliefs and opinions) regarding or relating to science are aspects of a larger construct known as attitude towards science (Glynn & Koballa, 2006; Simpson, Koballa, Oliver, & Crawley, 1995). Attitudes towards science are “the feelings, beliefs and values held about an object which may be the enterprise of science, school science, the impact of science on society or scientists themselves” (Osborne, 2003). It has been shown that student attitudes towards science are initially high at young ages (Simpkins, Davis-Kean, & Eccles, 2006), but decrease steadily through high school (Fredricks & Eccles, 2002).

It has been previously shown that the implementation of student-centered, problem-based learning (PBL) techniques can increase student engagement, good behavior and achievement (Gordan, Rogers, Comfort, Gavula, & McGee, 2001; Heid, Biglan, & Ritson, 2008; Oliver, &

Venville, 2011). One kind of PBL technique, scientific modules, involve content units that are designed in a way that puts students in the role of ‘scientist’ where they are confronted with specific issues that concern society and given responsibility to understand, engage and critically participate with that issue (Klopp et al., 2010).

### **Purpose**

This study was designed to measure the impact a scientific module-formatted (specifically a case study) instruction has on student attitudes towards science. Instruction using scientific modules has been shown to positively affect student understanding and performance in science, but little has been done to determine what effect (if any) this type of instruction has on student attitudes towards science. Specifically, this study explored the following question: To what extent does the presentation of content through scientific module format impact student attitudes towards science in a high school biology classroom?

### **Context**

This research study took place at a public high school in the southeastern United States in a Biology classroom where I was assigned to do my student teaching. The subjects for this research study were nineteen high school freshman honors-level Biology students, ten from one class and nine from another. Of those nineteen, eleven were female and eight were male. All students the two honors biology classes (a total of fifty-nine students) were invited to participate in the study. Data collection occurred during normal instructional delivery as part of an in-class assignment completed by all students. Participation in the instructional activities was not optional because it included critical content necessary for the course; however, subjects could elect for their activities not to be included in the study.

### **Methods**

This study took advantage of an action research format which allowed me to take my role as a student teacher in the classroom, enact a specific teaching methodology, and directly observe the effects of the teaching methodology (scientific module) on student attitudes towards science. The case study that the students were presented with was titled Genetic Testing and Breast Cancer: Is a Little Knowledge a Dangerous Thing? (Zales & Colosi, 2012). In this case, students are faced with making a decision on whether or not to get tested for the breast cancer gene after finding out a parent has breast cancer. Instruction using this case study took one block class period. The case study was presented after covering genetics and as a final component to a

unit on DNA technology. This case study worked really well in the context of this research project, as it took advantage of all the key aspects relating to a scientific module. It stimulated active and inquiry based learning and reflection and used authentic tasks and socioscientific issues (Klopp et al., 2010). Before the scientific module style instruction, students took an adapted version of Science (CARS) Questionnaire (Siegel and Ranney, 2003). Instruction was then presented in the scientific module/case study format, during which the subjects were video-recorded. Following the module instruction, students took another adapted version of the CARS questionnaire.

### **Results**

Presenting scientific information in a case study did appear to change student attitudes towards science, according to the survey data. Despite not finding significant data on the survey, responses from students were largely positive on this type of instruction. The most common occurring themes in their responses were that it was enjoyable/fun (n=6) and they liked working with their peers (n=5). The following student responses are representative of the larger sample of students: “I think the ability to debate among students helps us all to grow and learn together. I would love this to be the way we learn every day”; “I really like group work things and getting in front of the class. I would like science class more if we did things like this more often”.

At the end of the activity, students were given a closure assessment to gauge their level of engagement with the activity. The students were given a prompt asking them to evaluate the activity. I asked them to turn in their sheet as they left the classroom. On their closure assessment, nine students reported that they changed their mind over the course of the activity, while the other ten reported that they held their initial belief throughout. Sixteen students reported breast cancer related statistics. Ten students reported that they felt the decision making process was difficult. The following student response is representative of the larger sample of students: “I decided that Kathy shouldn’t get tested. I learned that only 5-10% of breast cancer cases are hereditary, and you could lose your job because of a disease. The decision making process would be hard in real life. It is probably difficult for people who make decisions like in this activity for real”.

Initially, students were hesitant to accept playing the role of another character. They needed some encouragement to separate themselves from what they would personally do, and think about their responses in terms of their specific character. Other than introducing students to

the concept of a case study and helping them to understand role-playing, there was very little instruction that had to be given. This particular case study was largely student-paced. I walked around to each group and asked them questions to determine their level of understanding and engagement, and answered any questions they might have had. After students were acquainted with the case, the level of student engagement increased, as evidenced by lively on-topic discussions occurring in each group. I think there were some initial issues with some of the students understanding how breast cancer might affect them, so they didn't pick up on the importance of the real-life situation. After some cuing about the incidence of breast cancer, and the fact that males can also be affected, the students began to come around. Students began to really embrace their characters. Many groups had difficulty coming to a consensus on what their particular character would do because they felt so strongly either for or against getting tested. Once the groups shifted to the book club groups the conversations were spirited and lively, with groups again having difficulty coming to a consensus.

### **Conclusion**

The use of inquiry-based learning strategies, such as used in this study have been shown previously to increase both attitudes and achievement in science (Gibson & Chase 2002; Zacharia, 2003). There are several potential reasons why I did not find a strong effect of case study instruction. First, I had a low sample size (n=19). It is possible that an increased number of participants could have revealed a significant result. Second, the students sampled came into the experiment with an overall positive view towards the application of science in the world today. Having higher initial attitudes toward science could mean that there is less room for the scores to change. Finally, students were only presented with one case study. It is possible that giving them more experience with the case study format could lend itself to a greater increase in attitudes toward science. Despite the fact that there was no significant effect of the case study on attitudes toward science, the students did report enjoying the type of instruction. When asked how they felt about instruction using a scientific-module format, students reported that they found the case study enjoyable and especially enjoyed working with their peers. Other studies have shown similar results, with presentation of material using real-life contexts significantly increasing interest in the topic (Herrington & Oliver, 2000).

Overall, students seemed to learn a lot about breast cancer and enjoy the process while doing so. More importantly than that, students had the opportunity to work with a group, and



using scientific information, make an informed decision on a topic that doesn't have a right or wrong answer. This is important because previous studies have shown one way to help students engage meaningfully with the world is by asking them to reflect on thoughts, feelings, emotions and actions relating to classroom activities (Klopp et al., 2011). Additionally, using active learning strategies increases student engagement and asks them to use higher order thinking skills (Grabinger, 1996). Methods such as the one used in the current study are often cited to improve student achievement and overall understanding (for review see Michael, 2006). Students enjoyed the format of instruction and learned while having fun.

In the future I plan to utilize case studies as much as possible. I felt that the case study helped make for a good classroom environment and provided important learning experiences on the way. Students enjoyed getting the opportunity to work in groups with their peers and getting the opportunity to spend the class period doing something unique. I believe it is important to give students experiences that involve them facing important decisions, of which there is no right or wrong answer and showing them how to take into account evidences of different kinds in order to inform their decision. Future research examining the effect of case study instruction on student attitudes should repeat the case study instruction with more participants. Additionally, it would be good to increase the number of case studies to which the students are exposed. Another interesting aspect to explore would be whether the case study significantly increases student achievement.

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## **Web 2.0 in High School Social Studies: What Happens?**

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June, 2012

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The field of social studies increasingly relies upon and promotes students' active engagement with content material. The notion that different modes of technology can help increase secondary social studies students' overall achievement, active engagement, and historical thinking skills is one which is widely discussed. In recent history, Web 2.0 technologies, such as blogs, wikis, and social networking sites, have been utilized for this purpose. These technologies allow for collaborative learning environments which have the potential to impact students' educations in a variety of ways. This study sought to examine what happened when high school social studies students write blogs on historical topics.

### **Review of Literature**

There are many ways to teach secondary social studies, but perhaps the most effective are methods which promote active learning and active engagement among students. Key, Bradley, and Bradley (2010) argue that in order for students to gain or increase content literacy in social studies classrooms, they must first be actively engaged. In addition, they argue that active engagement, which should occur through multiple types of activities, can promote student interest in social studies. In the past decade, research has been conducted in order to uncover ways to teach students to think historically in social studies classes. Lesh (2011) notes that teachers must adjust and improve their own instruction and methods to promote student historical thinking, largely encouraging students to form their own historical explanations, but students do not enjoy history or appreciate the material because educators are not encouraging and teaching them to engage with it. Lesh (2011) promotes the harboring of historical thought in students by veering away from traditional methods of teaching, e.g., lecture and memorization, to a more student-centered approach in which students themselves engage in investigating history and the past.

Currently, many social studies educators are working towards integrating technology into their daily instruction mainly through the use of Internet sources. Friedman and Hicks (2006) discussed the importance of using "enhanced instructional strategies [that] can scaffold student

learning” (online). In the past decade, Web 2.0 tools have seemingly taken over the Internet. Web 2.0 consists of a variety of new Web technologies that act as participation tools, allowing for seemingly any person, and not just large companies and government agencies, to disseminate information on the Web (Rosen & Nelson, 2008, p. 212; Maddux, Liu, & Johnson, 2008, p. 160). The notion of “social software,” such as blogs, wikis, podcasting, and social networking sites such as Facebook, have emerged as a major part of the recent Web 2.0 movement (Richardson, 2010; Rosen & Nelson, 2008; Alexander, 2006).

Social studies education stands to gain from integrating Web 2.0 technology into its curricula (Holcomb & Beal, 2010). Web 2.0 technology, such as wikis or blogs, could promote “hands-on, interactive, problem-based learning” (Holcomb & Beal, p. 28, 2010), thus encouraging students’ active participation and engagement with historical material. Wikis and blogs not only have the potential to help students with content knowledge, but they also can create learning environments, or communities, which are purely collaborative (Engstrom & Jewett, 2005). Therefore, studying the effect of these Web 2.0 technologies in secondary social studies classrooms is important in gauging effective methods through which to teach social studies. Ultimately, this study through the implementation of student created blogs via an educational Web 2.0 website will seek to answer the question: What are the effects of using student created blogs in high school social studies classes?

### **Methodology**

The participants in this study were students in three high school social studies classes at a suburban public high school in the south-east region of the United States. Two of the classes used in the study were standard level United States history students, and one of the classes used was an honors level United States history course. At the beginning of this activity, the students in class were informed that they would write wiki entries on specific historical topics relating to subject material multiple times throughout the semester. For each unit in which students wrote wikis, the class went to the high school’s media center or computer lab. Due to pacing and time restraints of following the North Carolina Standard Course of Study for United States History, the researcher was unable to implement the editing process for students. Therefore, the entries written by students acted as blogs rather than wikis due to the lack of collaboration from students’ peers. The three classes were given four blog assignments to complete over the course

of two months. Each blog assignment allowed for students to pick the topics they would write about from a list of historical topics pre-selected by the student teacher.

At this high school of 1,434 students and nearly 100 faculty and staff, teachers must sign up for time in the media center, which had about 25 computers, multiple of which were dysfunctional at different times, in advance (North Carolina Board of Education, 2011). The first of four times that the students visited the computer lab or media center, both the two standard classes and the honors class were instructed to write three blog entries on the three sections of the Civil War unit. For the next three sessions of blog writing, however, the researcher reduced the amount of blog entry paragraphs that the standard classes were required to write down to two in an attempt to give them more time to focus on their two assignments.

Student blogs were collected as artifacts to serve as data for the study. The researcher used a purposefully selected sample of student writing, which included four students who have been given pseudonyms. The researcher utilized the “grounded theory,” relying upon the notion that results and subsequent analysis would emerge from the data itself, rather than going into the research process with a preconceived theory in mind (Strauss & Corbin, 1998, p.12). Grounded theorists must “step back and critically analyze situations,” allowing for conclusions to surface from the data itself (Strauss & Corbin, 1998, p.7). Therefore, the researcher looked back at the data, namely student blogs, and purported to analyze any conclusions that emerged from the data involving the blog writing process.

The researcher worked to analyze observations of what was going on in class and consequently videotaped multiple class sessions during which students spent in the computer lab working on their wikis. The researcher analyzed the videos using Spradley’s (1980) “Descriptive Question Matrix,” which focuses on a variety of factors occurring during the event being observed, such as space, the activity, the actors, goals, and feelings (p. 82-83). While using this matrix, the research again relied upon the “grounded theory,” allowing for the theory to arise from the data gathered in the study. Upon the completion of the blog writing process, the researcher provided the students with a survey, which functioned to analyze student attitudes regarding the use of wikis in a secondary social studies classroom. Most questions included a Likert Scale as well as a place for the student to explain his/her answer to each question.

## Results

This study yielded several overarching results. As each of the three classes visited the school's computer lab or media center on four separate occasions to complete blog assignments, new obstacles and issues arose associated with using technology and specifically Web 2.0 technologies. In this study, students used EdModo (Edmodo.com) in order to post their entries on various historical topics. Due to a number of factors, such as student effort, technology availability, the demands of pacing and lack of time, and other logistical issues posed by using technology-driven assignments in a school with dated technology, the study required a change from focusing on student created wikis to student written blogs. Because of the strict demands of pacing and the time allotted for each topic in United States History as laid out by the North Carolina Standard Course of Study, students were unable to edit the work of their peers.

Each session spent in the computer lab or media center was half of the class period, with a total of 45 minutes for students to write blog entries. This time was often interrupted by school requirements. The high school in which this study took place has computers which run on Windows XP, a Microsoft operating system released in 2001. The computers themselves were also antiquated and took somewhere between five to fifteen minutes to turn on, and then another few minutes for students to login into with their student identification numbers. Also, there were often not enough functional computers for the students to work on. In addition, students often forgot their passwords for EdModo, and had to take instructional time to create a new account, thus preventing them from writing their blogs entries. Further, pacing prevented many students from finishing their blog entries. Due to the strict guidelines and the required amount of information to be covered, students were also unable to edit their peers' work. Another issue that occurred was lack of student effort on behalf of some students. Laziness and procrastination prevented some students from working on their blogs. Despite this, many students were able to write blogs, and consequently displayed an understanding of course content. Student opinions from surveys regarding writing blogs were largely neutral, with outliers feeling overly positive or negative regarding the blog-writing process.

## Discussion

This study has implications for social studies teachers, teacher educators, and district personnel. As the world becomes increasingly globalized, social studies teachers should work to ensure that their students are acquiring the appropriate 21<sup>st</sup> century skills that will promote their

global citizenship. As such, it is important for social studies teachers to educate their students about using modern technologies, including Web 2.0 websites, while also supporting the students' responsible use of such media. Further, it is helpful for teacher educators to understand the effectiveness of utilizing Web 2.0 in secondary social studies classrooms, and thus they should be prepared to train future teachers to incorporate its use into their classrooms. In order for teachers to utilize these technologies, district personnel must understand the limitations of having dated technologies in schools, and must decide the utility of purchasing newer, more efficient computers so that teachers can carry out these activities.

The results of this study yielded many results and implications largely as a result of using dated technology in a modern American high school. This study inherently required students to utilize computers and the Internet, and specifically the Web 2.0 site Edmodo.com. The lack of availability and functionality of the technology in the school, however, often prevented students from participating in the blog-writing process. Therefore, this study shows the implications of having dated technology in a society which has increasingly placed importance on its students acquiring 21<sup>st</sup> century information, media, and technology skills. This study in particular reflects the challenges of pacing, and shows that covering the adequate amount of course material does not always allow for extra activities to occur in class. Despite the obvious problems with relying upon dated technology sources for activities, writing blogs and using other Web 2.0 technologies can be an experience for students that are not only enjoyable and new, but also one that increases students' digital citizenship and 21<sup>st</sup> century skills.

The primary goal of educators should be to teach their students effectively to actively engage with the course content (Key, Bradley, & Bradley, 2010). One way for teachers to encourage this type of thought is by utilizing Web 2.0 technologies so that students can write about and synthesize important information relating to a variety of historical topics. The implications for teacher educators in this study provide insight into the limitations in guiding future teachers on the usage of technology in modern American classrooms. Much of teacher education today, particular in the social studies, focuses on using new technologies, such as Web 2.0 sites or digital primary source websites. Mason et al.'s (2000) set of guidelines for social studies teachers introduces ideas for using technology in the classroom appropriately, including the need to "extend learning beyond what could be done without technology" (online). As such, teacher educators should encourage future teachers to use computers and other technology to

enhance student learning. This study also demonstrates the need for American high schools to update their technology and computers so that students are able to use helpful web resources as a part of their education. As most district personnel likely want to promote what Holcomb and Beal (2010) refer to as “hands-on, interactive, problem-based learning,” it would benefit them to invest in functional, appropriate technology that allows for students to utilize a variety of helpful web resources while also developing their 21<sup>st</sup> century skills and digital citizenship (p. 28).

### Conclusion

As society increases its interest and use of modern technologies, their responsible and effective use in classrooms becomes required for students to develop into global citizens with 21<sup>st</sup> century skills. This study shed light onto the demands of pacing set out by the state, showing the difficulties of spending an extended amount of time any one topic. This study also examined the effects of using Web 2.0 technologies in modern high school social studies classes, and showed that current computers available in many schools prevent students from participating in many 21<sup>st</sup> century activities.

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# **Creative Expression in the Math Classroom: How Incorporating Performance Arts Affects Student Engagement and Motivation**

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June 2012

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Teachers must make sure that their students harness learning and innovation skills conveyed by the 21<sup>st</sup> Century Student Outcomes in order to succeed and excel in the changing and innovative world around them. More precisely, students must be able to achieve critical thinking skills through the mediums of communication, collaboration, and creativity (Partnership for 21st Century Skills, 2009). Using “performing arts” to teach the curriculum implies incorporating various forms of communication, such as writing, movement, and music into the classroom. Composing any type of media integrates creativity, allowing for students to showcase their knowledge in the best way that suits them. The ability to design, develop, write, and create are all a part of the highest level of intellectual behavior according to Bloom’s Taxonomy. Thus, it is expected that the encouragement of students’ creativity in the classroom will lead to higher order thinking.

The use and incorporation of the arts into the mathematics classroom also aligns with two of the National Council of Teachers of Mathematics Process Standards: Communication and Representations (National Council of Teachers of Mathematics, 2000). Allowing students to express their content knowledge through various forms of media, whether it be songs, poems, dramatization, or movements, provides the whole class with multiple representations of the content.

This study seeks to integrate the arts into two Algebra II classes in the form of a project to examine the effects that the incorporation of the arts has on the students’ engagement and motivation.

## **Review of Literature**

The research conducted by Villegas (2011) and Schuler (1992) implies that all aspects of the arts have proven positive effects on the motivation of students. Villegas (2001) also asserts that providing choices to students of how to express themselves results in a feeling of autonomy and self-assurance for the student concurrently motivating them to participate. They recommend

that options be provided to the subjects of how they wish to “express” themselves encouraging them to use their own creativity. In the Mathematics classroom especially, it is inevitable that some students will not be interested in the subject itself. It is important to have teaching methods and strategies that will encourage them to want to learn and also boost their engagement.

Engagement in the mathematics classroom is essential to ensuring the academic achievement of all students. Park’s (2005) research results indicated that student engagement consistently affected student academic growth regardless of minority status and gender. Teachers are always seeking out new resources and online activities to excite students and support their learning, but seldom do they see the use of performance arts to teach or demonstrate mathematical concepts as being an applicable method of teaching.

### **Methodology**

Participants of this research included high school Algebra II students in a high school in a small city in a southern state. The participants were asked to anonymously complete a survey and participate in a focus group interview to assess their levels of engagement and motivation. The treatment was the inclusion of performing arts into their math project. Both the survey and the focus group interview occurred after the treatment (the project) was completed.

The survey asked participants a series of ten yes or no questions detailing their opinion on how the project affected their motivation and engagement in the math class. This data was used to explore if there was a relationship between the incorporation of performing arts into the class and students’ motivation and engagement.

In order to obtain additional qualitative data and student insight, students were selected to participate in brief interviews conducted in focus groups. The focus group interviews were comprised of five open ended questions and sought to further analyze students’ overall attitude and opinions about the inclusion of arts in their project. The focus group interviews were audio recorded and transcribed by the researcher.

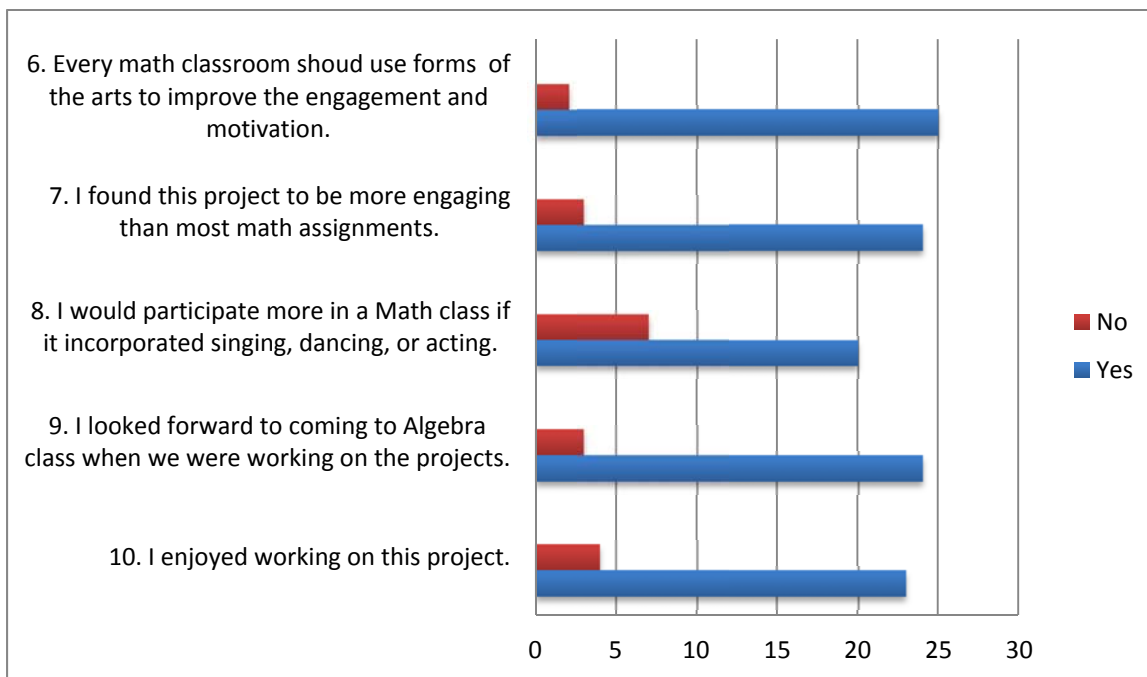
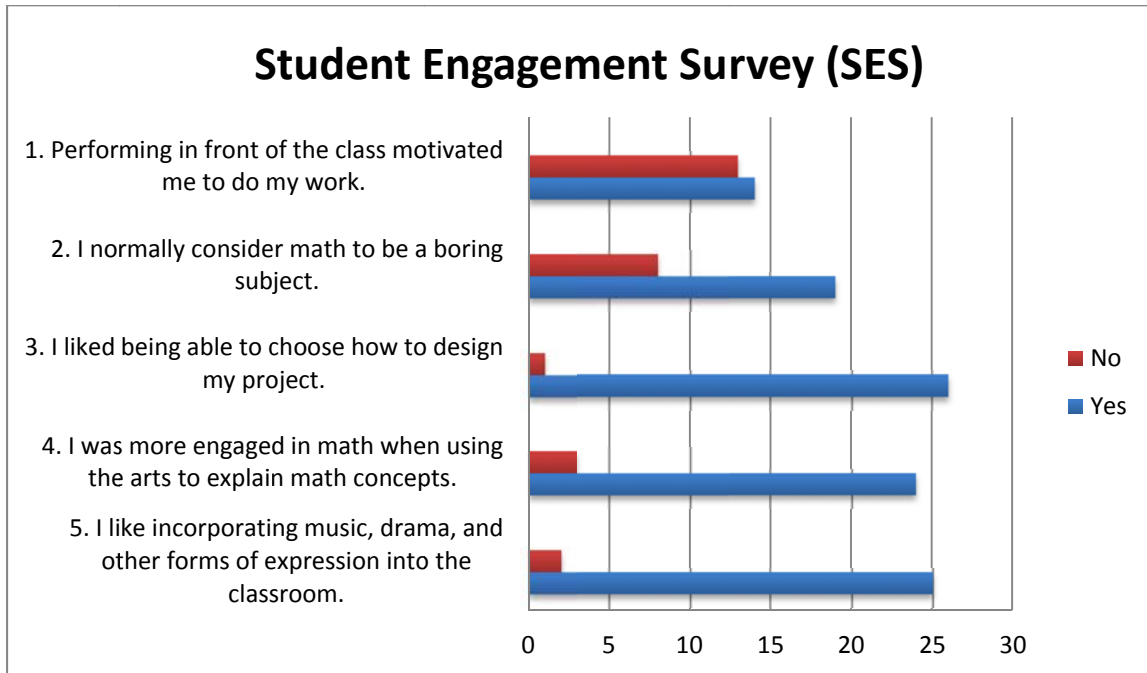
Additionally, video footage along with field notes on student engagement levels was taken throughout the course of this study. The researcher looked specifically for changes in student posture, participation, and facial expressions.

### **Results**

The primary goal of this research study was to investigate the effects that the inclusion of arts in the mathematics classroom had on student engagement.

The survey data and focus group discussions correspond to the students' own thoughts and opinions about the project that incorporated the arts into their math classroom. The students had a choice whether they could make up their own skit, song, or other form of art form, or they could use one provided by the teacher. They also volunteered to perform their projects in front of the class.

**Student Engagement Survey:**



### **Focus Group Analysis:**

The purpose of the focus group discussions was to use student input to further evaluate and understand the impact that the incorporation of arts into the math classroom had on engagement and motivation. Recurring themes were looked for and established during the study of the audio recordings. The majority of the students said that performing arts classes are more “fun” and “exciting,” and that the atmosphere of a performance arts classroom is much more welcoming and engaging. We evolved this question into a discussion about why the arts, especially music, is so engaging to the majority of the students. What they concluded was that art, music especially, is a huge part of all teenagers’ lives and that it is something that everyone can relate to.

### **Video Footage Analysis:**

In watching the videos, I looked for changes in student’s postures, their focus on their studies, and their overall energy in the class. As expected, the posture of the subjects was completely different when the arts were being used in any facet in the class than when they weren’t. Subjects who were normally texting, doodling, and even sleeping, were sitting upright in their seats with full attention on the presenter, or the task at hand. All of these scenarios arising from the video footage support the theory that using the arts in the math classroom increased students’ engagement with the class itself.

### **Discussion:**

The results of this study suggest that the incorporation of arts into the math classroom does affect the engagement and motivation of most students in a positive manner. The most unusual data discovered was the fact that quite a lot of the students had no desire to participate any more than before. In fact, 26% of them said they would not participate more if the arts were used and a stunning 49% of them said that performing in front of the class did not motivate them to do their work. What could have skewed this information was that the “presenting” of their projects ended up being optional and counted as extra credit.

Being able to find avenues to increase the motivation and engagement of students is critical when discussing the success of students in schools. Just as seen in the study conducted by Barry, Taylor, and Walls, (2002) the involvement of performing arts more often than not, encourages student participation, therefore increasing attendance and motivation in class. What

should to be studied further are the different personality types of students and the effects that their personality has on how they are engaged and motivated in the math classroom.

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# Exploring Students' Perceptions about Math: The Value of Explanations in Modern Context

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June 2012

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Students can demonstrate thorough knowledge of mathematical concepts by correctly and appropriately explaining their understanding to others. As methods of communication change with advances in technology, students' communication skills also change. A considerable amount of research has focused on students' ability to communicate their understandings, including the importance of using written explanations to further knowledge of mathematical concepts. However, as technological advances have opened new possibilities for expressing ideas, instructional assessments have not kept up. The majority of student communication does not reflect the advances of the 21<sup>st</sup> century.

Students' ability to clearly communicate their ideas is crucial to their development as mathematicians. The National Council for Teachers of Mathematics (NCTM) points to communication as one of the five process standards for mathematics, emphasizing that students should be able to "communicate their mathematical thinking coherently and clearly to peers, teachers, and others" (2000). The realization that students must not only reason mathematically, but justify their reasoning, has led to more language-based assignments in math classes.

Written assignments rarely take advantage of the wide variety of current technologies available for communication. This study seeks to provide a culturally-relevant context wherein students interact with course material through the lens of the social networking website Twitter.

## **Review of Literature**

Pugalee (2004) contends that written responses inspire more thoughtful answers that demonstrate higher levels of thinking than responses given verbally. His study analyzed differences between students' written and 'think-aloud' (verbal) descriptions of their problem-solving methods. Written student responses not only elicited more correct answers than 'think-aloud' responses, but included "significantly more orientation and execution statements" (p. 43). One possible explanation for this result is the time spent with course material: students must think before crafting a response. A study on the effect of journaling in calculus classes found that

journals could be successfully used to apply concepts and to encourage higher-level thinking (Mett, 1989). The students in this study reported that they viewed journaling as a productive educational experience, believing that the activity increased the amount that they learned.

In addition to the value of written descriptions to the students' problem-solving process, Baxter, Woodward, and Olson (2005) contend that written explanations improve engagement and promote mathematical development. This observational study categorized student explanations as falling into one of four increasingly complex levels: recording, summarizing, generalizing, or relating. Journaling engaged the students with course material, increasing the complexity of their responses.

Looking to the internet world, the blogosphere offers a way to engage students in mathematics in a culturally relevant manner. MacBride and Luehmann (2008) present classroom blogs at the high school level as a novel method for increasing student engagement with course material. The results of this study emphasize that students' blog posts were "examples of students' ability to provide in-depth, thorough and multi-modal personal explanations of complex mathematical content and procedures" (p. 182). The students in the study, realizing the global nature of the blogosphere, felt a sense of responsibility to convey correct information and appear knowledgeable, which led to improvements in the quality of their writing.

Howard, Ellis, and Rasmussen (2004) explored the capacity of hypermedia to provide students with a variety of text, graphics, sound, and video. The study found that a learner-controlled hypermedia module resulted in a better understanding than could be achieved through traditional teaching methods. Students praised the application, and "used words like 'outstanding', 'beneficial', 'entertaining', and 'worthwhile' to describe the experience" (p. 438).

The current study will use the format of social networking to reach students in a way that is relevant to their 21<sup>st</sup> century lifestyles. The research questions that guided this study were:

- What impact does the integration of technologically relevant contexts have on students' perceptions of their mathematical abilities?
- How do students feel about using the context of a simulated social networking site to record responses in math?

### **Methodology**

The researcher student-taught a mixture of honors and standard level Geometry courses at a public high school in North Carolina. All 96 of the students in the researcher's three Honors



Geometry classes completed summarizing activities (MathTweets) several times as part of normal instruction for the duration of a course unit. The MathTweets were completed with pencil and paper only, but simulated the social networking website Twitter. The assignments asked students to summarize the key concepts from class using 140 characters or less, including a 'hashtag' (key word or phrase) that could be used to categorize information. Hashtags are denoted using the “#” symbol and are commonly used on the social networking website Twitter to identify “trending topics,” words or phrases that multiple people are posting about on the site.

Examples of work from the students who agreed to participate in the study were collected for analysis. At the completion of the unit, students who agreed to participate in the study were given an anonymous survey. The survey asked participants to indicate whether or not they regularly use the social networking website Twitter and then presented several Likert-scale statements that asked about their perceptions of the activity and math in general. One of the classes was randomly selected to participate in a focus group. The focus group, which took place during class, consisted of open-ended questions that sought information on students' attitudes toward math and toward MathTweets.

Student work samples were used to examine the various student approaches to the assignment and the depth of student understanding as presented in the MathTweets. Summary statistics were calculated from the student surveys to identify overall attitudes toward MathTweets and toward the math class in general. Data from the class focus group were used to identify themes in students' perceptions of MathTweets.

### **Results**

The purpose of this study was to analyze the effects of simulated Twitter use in the high school Geometry classroom. All 96 students in the researcher's Honors Geometry classes were given the opportunity to participate in the research study. Only 23 students agreed to participate in the study and 18 of those 23 returned completed student surveys. 20 students came to the focus group. This study yielded three distinct data sets: student work samples, results from student surveys, and a transcript from the focus group discussion. The survey results will be presented first, followed by the majority of the results section, organized around key themes pulled from the focus group. For those students who participated in the study, names used in the results section are pseudonyms designed to protect anonymity.

Overall, the survey indicated that few students had strong feelings toward the overall effect of MathTweets. Twelve of the eighteen students who completed the survey responded that they use the social networking website Twitter. The remaining four items on the survey were given on a Likert-scale from strongly disagree to strongly agree. On three of the four items, both the most popular response and the median were neutral. The exception to this neutrality was the most popular student response to the statement “MathTweets are fun” was ‘agree.’ The breakdown of student responses and the average for each question is listed in the table below.

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Average
MathTweets made me like math better.	5	1	11	1	0	2.44
MathTweets helped me understand math.	3	4	8	3	0	2.93
MathTweets are a good way to explain math.	3	5	5	4	1	2.72
MathTweets were a fun math activity.	3	3	4	6	2	3.06

### **Varying Levels of Effort**

While some students became invested in the MathTweets, others felt that the assignment was asking solely for definitions. In the focus group, Alecia commented, “*I thought it was pointless and we just did definitions and then hashtag and then the word.*” While Alecia was not the only student who saw little value in the exercise, some students noted that the value of the assignment depended on the amount of effort. In response to Alecia’s criticism, Maria said “*I think if you made it good, it would be good. But if you didn’t try, then it had no impact.*”

The difference in student effort can also be seen in student work samples. Many students had responses that did not necessarily reflect an understanding of the material. The responses made true statements, but they lacked application or insight, relying instead on exact technical definitions. Some students who had a better understanding of the assignment were able to use MathTweets to draw conclusions about relationships between different vocabulary words. Maria, demonstrated a thorough knowledge of the relationship between a circle and its tangent line by writing “*a tangent can only touch a circle at one point #pointoftangency.*” Not only did she explain the definition of a tangent line in her own words, but she also recognized the relationship between the vocabulary word and a related term that is described in her definition.

One of the best examples of a student using the MathTweets assignments to explain a concept in her own words was written by Sarah. In describing how to find the measure of an angle formed by two lines intersecting outside of a circle, Sarah wrote, “*If there is a ice-cream cone, you subtract the smaller part from the larger and divide by 2*”. While the description of an ice cream cone may not necessarily make sense to every Geometry student, Sarah used the MathTweets assignment to explain her own understanding of a theorem.

### **Inadequacies of the Simulated Environment**

One of the recurring themes during the focus group was the lack of connection between the simulated MathTweets in class and the technologically relevant context of Twitter. Although 12 students used Twitter, the MathTweets activity did not sufficiently connect to their use of the site. Instead of completing her assignment, one student wrote, “*@halfandhalf that’s where its at #tweetingonpaperisdumb.*” Although this student chose not to participate in the focus group, it was clear that she did not feel like the simulated environment connected with her use of Twitter.

After noting that she felt the exercise was pointless, Alecia offered a suggestion to make the activity more interesting: “*Now, maybe if we actually tweeted it.*” To better understand what students felt like they were missing, I asked about using text messages or another technique for submitting responses. Richard was enthusiastic, noting that he wanted to be able to see what other people wrote. Similarly, he expressed potential for the activity to spark student interest and engagement: “*I paid attention in class when you said something about, like, MathTweeting. Like, I was honestly not paying attention until that point.*” He expressed that the activity had potential to be engaging, especially if it were digitally based.

### **Discussion**

This study found that the simulated Twitter environment left much to be desired. Students felt that MathTweets had little impact on their understanding. One advantage of the activity was that students found it enjoyable. The focus group interview revealed that the amount students learned correlated to their demonstrated effort. The attempt to create technologically relevant contexts without using any technology devices was largely unsuccessful. However, students appreciated the attempt to relate to their personal lives through social media.

The low level of student explanation is inconsistent with the findings of Baxter, Woodward, and Olson (2005), as written responses relied heavily on recording definitions rather than summarizing, generalizing, or relating material. The advantages of writing in the

mathematics classroom touted by Pugalee (2004) and Mett (1989) support the use of longer student responses. MathTweets, designed to emulate a social networking atmosphere familiar to most students, relied on short responses that did not afford much space for student explanation.

Another limitation of this study was the lack of technology in the simulated Twitter environment. The success of classroom blogs explored by MacBride and Luehmann (2008) relied heavily on the weight of the blogosphere community. The format of MathTweets lacked the pressure of the outside world that held students accountable in the classroom blogs. Since the only person who would see students' MathTweets was the classroom teacher, that sense of accountability was lost. Even though technology was lacking in the simulated environment, this study found similar student interest in the concept of MathTweets as was found by Howard, Ellis, and Rasmussen (2004). The hypermedia experience provided for the college students allowed them to explore content in a context that was meaningful to their lives, just as the MathTweets concept applies to the social lives of many high school Geometry students.

The interest in the activity offers implications beyond this classroom, in using social media contexts to interact with students. However, in order to implement this activity again, changes should be made to ensure that students think critically about course material, summarizing or relating material rather than just restating ideas. To maximize the effect, the activity should be conducted in a true technology-rich environment rather than through simulation. Future research on integrating social media into the classroom should include the use of technology-based social media tools. Using the familiar interactive environment that students cherish, additional research should also focus on the benefits of the abbreviated environment Twitter creates by restricting the total length of description.

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# **An Investigation of Using Graphing Calculators to Improve Conceptual Understanding in Secondary Mathematics**

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June 2012

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Integrating technology into the classroom is becoming increasingly important as we strive to prepare students with the skills that they need to be successful in the twenty-first century. The National Council of Teachers of Mathematics (NCTM) claims that “[t]echnology is an essential tool for learning mathematics in the 21<sup>st</sup> century” (2008). NCTM (2008) further explains that “[c]alculators and other technology tools...are vital components of a high-quality mathematics education” and that “[e]ffective teachers maximize the potential of technology to develop students’ understanding, stimulate their interest, and increase their proficiency in mathematics.”

Research shows that the use of technology, and in particular calculators, generally increases mathematical understanding. However, Buchberger (1989) raises interesting questions with his White-Box/Black-Box Principle for calculator use in mathematics education. According to Buchberger, dividing learning into two-phases in which technology replaces hand calculations only in the second phase, would benefit students by expanding the scope of their mathematical knowledge. This method would nurture problem solving skills and allow students to study topics of interest on a deeper level. Buchberger calls for further research into the effective use of calculators with respect to the White-Box/Black-Box Principle. However, technology is a complicated area to research. Since technology is constantly evolving and improving, there is a perpetual need for new research in this area to determine the most effective way to integrate new technologies in mathematics classrooms.

## **Literature Review**

There is strong evidence for the benefits of using technology in the classroom. Research shows that incorporating technology with instruction can have a positive effect on students’ attitudes, general achievement, procedural knowledge, and conceptual knowledge. Ellington (2006) conducted a meta-analysis to determine how graphing calculators affect overall mathematics achievement, the development of procedural and conceptual skills, and students’

attitudes toward mathematics and calculators. Ellington found that, in general, students benefited a great deal from using graphing calculators in their classes. In particular, students who used graphing calculators in the studies exhibited more positive attitudes toward mathematics than students who did not use calculators to learn mathematics. The study also reported more positive attitudes toward calculators from students who used graphing calculators.

Research provides evidence that the integration of technology, and especially the use of calculators, improves student achievement and builds procedural and conceptual knowledge. In Palmiter's (1991) study, students who were taught using the Computer Algebra System scored much higher on the computational and conceptual exam than students who were taught to perform calculations by hand only. Ellington (2006) found that the use of graphing calculators improved procedural knowledge, but the increase in knowledge was more pronounced when calculators were used during both instruction and assessment. The meta-analysis also showed that the use of graphing calculators facilitated the acquisition of conceptual knowledge. In Quesada and Maxwell's (1994) survey, students in the experimental group reported that with calculators they were able to do more exploration and that the graphing calculators helped them to better understand the concepts that they studied in their precalculus course.

While the integration of technology has strong positive effects in the classroom, using digital-age tools also has some limitations. According to Guin and Trouche (1999), weaker students sometimes use calculators to replace mathematical reasoning through trial-and-error strategies and fishing behavior. In this way, technology is used as a crutch and students are able to complete calculations without reaching the desired level of mathematical understanding. Milou's (1999) study of Algebra I and Algebra II teachers supports these findings. He surveyed one hundred forty-six teachers from fifty-one school districts and found clear teacher support for the white-box use of calculators. Teachers preferred that students not use technology to replace calculations until after they mastered hand computations. Quesada and Maxwell (1994) observed a similar concern from students in their study on the effects of using graphing calculators in college pre-calculus classes. Doerr and Zangor (2000) also identified problems with calculator use in the precalculus classroom. Firstly, the authors found that students attempted to use the calculator as a black box, performing calculations without a meaningful strategy for using the calculator and without considering meaningful interpretations of the

problem. The second issue that Doerr and Zangor found was the private use of the graphing calculator, which often weakened group interactions.

Slough and Chamblee claim that “[t]echnology represents a constantly changing innovation and thus presents special problems for change” (2007, p. 222). The perpetual evolution of technology relentlessly necessitates new research. Slough and Chamblee also explain that successfully implementing a new technology is a process so researchers must continually work to determine better ways to utilize technologies. NCTM further emphasizes the importance of *effectively* integrating technology in mathematics classes with the following from its position paper: “The use of technology cannot replace conceptual understanding, computational fluency, or problem-solving skills...the strategic use of technology enhances mathematics teaching and learning” (2008).

Several studies acknowledge the need for further research regarding the effective integration of technology in the classroom. Doerr and Zangor (2000) and Hollar and Norwood (1999) recognize the need for additional research into the effects of graphing calculators on student learning. The survey by Brown et al. (2007) revealed that teachers believe that using calculators is beneficial to their students, but they still have some reservations about incorporating calculators into their practice. Teachers responded that they want to know how they can use calculators more effectively in their classrooms.

Research shows that the integration of technology, and in particular calculators, in classroom instruction greatly benefits students in terms of attitude towards mathematics, general achievement, and procedural and conceptual understanding. Yet questions remain for researchers and practitioners alike regarding the most effective ways to incorporate this tool to maximize these potential benefits. This study addresses the following question: How does the use of graphing calculators support conceptual understanding in mathematics?

### **Methodology**

Participants included twelve students in one intact section of standard Algebra II. Every student in the class used a TI-84 graphing calculator for in class assignments. The researcher instructed students in the course with different instructional methods for the duration of two units of study. For the first unit on Quadratic Functions, students were taught the material first without the use of a graphing calculator and then used graphing calculators to support their

learning of the topic. The researcher introduced material in the next unit on Cubic Functions with a graphing calculator first and then taught the material without the use of the calculator.

Student work was used to analyze conceptual understanding of the material. A pre- and post-test design was used to compare achievement and conceptual understanding for each unit of study. Descriptive and inferential statistics (ANCOVA) were used to determine whether there was a significant difference between the two instructional methods in terms of conceptual understanding. The researcher also interviewed a focus group of five randomly-selected students after the Cubic Functions unit ended. Audio-recordings of the focus group interviews were analyzed for themes.

### Results

The mean of the scores on the pre-test for the Quadratic Functions unit was 5.73 percent and 69.79 percent on the post-test, for an average gain of 64.06 percent. For the Cubic Functions unit, the average score on the pre-test was 12.5 percent and the mean score on the post-test was 59.03 percent, for a gain of 46.53 percent. An ANCOVA was run to determine whether or not the unit (unit 1 versus unit 2) significantly affected student performance on the tests. The unit was not a statistically significant factor on student performance (p-value of .719).

In the focus group interview, five students indicated that they are comfortable with using the graphing calculator in class and that they think it can be a useful tool. Throughout the interview, several students explained that using graphing calculators can make problems easier to solve and can save them time on their assignments. For example, in response to question 1, Student B said “I’m very comfortable with it because it’s easier to solve problems and I don’t have to think that much.”

Student responses also suggested that students primarily use the TI-84 graphing calculators for two types of tasks: performing simple arithmetic operations and solving problems graphically. Questions 8 and 9, in which students were asked how they would graph a given function, supported these statements. Students explained that they would graph these function with their calculators: “Putting it in the calculator into ‘Y=’ to graph it.”

In general, students suggested that they tend to work problems whichever way they are shown first. In response to question 3, Student C explained “...it depends on the way they taught you. Sometimes it’s simpler by hand or sometimes the calculator helps more.” Some student responses also indicated that students generally prefer to solve problems by hand whenever



possible. For instance, Student G answered question 3 with the following: “I actually like to work it out because sometimes I put in the wrong number in the calculator and I don’t know where I messed up at, so if I do it by hand, I can actually see where I messed up...” Participant responses to the think-aloud problems supported this claim. On question 9, one student suggested to first try solving the quadratic equation by factoring the quadratic expression. On question 10, another student responded that he would try to find the root of the cubic function by hand, using synthetic division. Student responses showed that students preferred to solve problems by hand because it can be simpler in some cases and because they are more confident that their answers are correct. Four out of the five participants said that they preferred the way we studied Quadratic Functions. Furthermore, the focus group participants unanimously agreed that they understood Quadratic Functions better than Cubic Functions.

### **Discussion**

The literature shows that the use of graphing calculators in mathematics classes can greatly benefit students in various ways. This study aimed to determine whether the way in which calculators were used could significantly affect gains in conceptual understanding. Although the analysis of student work did not show a statistically significant effect of the unit on student scores, the focus group interviews provided interesting insights into the use of graphing calculators in an Algebra II class.

Student responses in the focus group interviews seem to indicate student support for both the white box use and the black box use of calculators, although some students showed a stronger preference for the former. Participants in this study tended to prefer to solve problems in whichever way they were shown first. Nevertheless, participants also showed a stronger preference for the white box use in some cases. Several student responses suggested that they prefer to solve problems by hand whenever possible. Four out of five students indicated that they preferred the way in which they studied Quadratic Functions over the methods for the second unit of study because it seemed simpler to solve problems by hand first. Yet student use of the calculator, both from the researcher’s observations and from student responses to the focus group interview questions, seems to also depend on the type of task that students are performing.

In general, responses during the focus group interview indicated that students felt that calculators are valuable tools, but that they preferred to model the researcher’s problem solving methods or try to solve problems by hand first. Students felt that they had a better understanding

of Quadratic Functions, which is supported by their higher post-test scores for that unit. However, the results of this study cannot conclusively lead to a claim that one teaching method is more effective at building conceptual knowledge than other. Literature shows that graphing calculators in general can increase conceptual understanding, but various factors influenced the results of this study. For example, students in this course tended to perform especially poorly on open-ended questions and demonstrated a poor conceptual understanding of previous topics covered in this course. Another limitation of this study was the timing of the units. The Quadratic Functions unit took place before spring break, while the Cubic Functions unit was taught after the break. There was a noticeable difference in student motivation and work ethic in each unit.

This study could not conclusively conclude that one teaching method with graphing calculators significantly increased conceptual understanding more than the other. Nevertheless, participant responses in the focus group interview yielded insights that will help the researcher shape future teaching methods with graphing calculators.

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# **The Effect of Personal Goals on Student Motivation and Achievement**

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June 2012

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In order to accomplish anything, it is necessary to have a goal in mind. In the classroom, of utmost concern is motivation and achievement. In 2004, Miller and Brickman proposed a new theory of goals that focused on future-oriented motivation. They argued that connecting personal, future goals to current academic studies was a central concern, and that often lack of this connection is what leads to disengagement. They maintained that personal, future goals result in the development of sub-goals. These sub-goals are proximal in nature and form a framework for evaluating every task. Now, a person is more likely to view a present task as valuable since there is incentive to complete the task due to its relationship to a future goal. They posited that the more clearly defined the sub-goals are, the more likely a person is to perceive a current task as instrumental. In a study of 421 college students, Tabachnick, Miller, and Relyea (2008) directly tested and confirmed this theoretical framework using path analysis. Researchers suggest that “motivational interventions which address only proximal goals, may fail to increase motivation to any substantial degree because they leave an important dimension of motivation untapped - the connection to valued future goals” (Miller, Greene, & Debacker, 1999).

Therefore, the goal of the present study is to focus on students’ personal, future goals in order to ‘tap into’ this dimension of motivation. This was done by intervening in a high school math class, helping those students develop their own personal, future goals and sub-goals, then seeing if this affected how they view the course and their achievement.

## **Literature Review**

In a study of Kansas City students, Kadlec and Friedman (2007) found that 76% of students attributed other students’ lack of success in the math or science classroom to the fact that those students do not see the course as relevant. In focus groups, students also reported that their current advanced math classes were irrelevant to their future. Likewise, in a qualitative study, a mere 37% of students responded positively that their future would be related to the material they were currently learning in the classroom (Johnson, 2000). Shockingly, Johnson

also reported that 85% of students who identified math as their favorite subject did not know how it would relate to a future career.

Personal, future goals also affect students' self-regulation and motivation. DeVolder and Lens (1982) discovered that male high school students with better study habits strongly valued future goals. Similarly, in a non-academic setting, those who emphasized long-term future goals were more satisfied and proved to be more persistent (Zaleski, 1994). In a survey of a nationally representative sample of high school students, self-regulation was more predictive of achievement than parental involvement, gender, or ethnicity (Bembenutty 2005). As Bembenutty (2005) observed, "students' active and proactive role in their own learning process is a key determinant factor in their academic success" (p. 7).

Personal, future goals are connected to perceived instrumentality and achievement. Perceived instrumentality, is defined by Miller, Greene, and Debacker (1999) as "a goal-related variable that represents the extent to which individuals perceive task performance as instrumental to the attainment of a valued future goal." The results in one study indicated that there is a direct relationship between how students value their course and coursework and how they perceive the class will benefit them in the future (Miller et al., 1999).

Achievement is a primary goal in education; thus, educators constantly seek to improve their students' achievement levels. Perceived instrumentality was associated with achievement in three studies of college students by Malka and Covington (2005). In the first study, many students identified instrumental goals as reasons to achieve in their class. In other words, the reason they sought to do well in the course was directly affected by their view that success in the course was necessary to achieving some future, personal goal. The second study confirmed that perceived instrumentality accounted for grade variance more than any other variable.

### **Research question**

How does having students identify self-relevant future goals and form related sub-goals affect their perception of relevance, task instrumentality, and achievement in a math class?

### **Methodology**

#### **Participants and Treatment**

All of the students from one standard Algebra II class were asked to participate. Fifteen students chose to participate. There were eight males and seven females in the sample, ten of whom were minority students. The treatment was short, additional assignments during a

standard unit. The assignments had students 1) identify their personal, future goals, 2) create sub-goals they must achieve to reach them, and 3) reflect on the connection between math, their current class, and their future.

### **Measures and Analysis**

**Surveys.** Short pre- and post- surveys were distributed to the students, before and after the treatment, respectively to assess students' attitudes towards this particular math class and math in general as they relate to the students' future goals. Surveys were coded to analyze any changes in specific student's attitudes as a result of the treatment. Data from yes/no responses were analyzed using descriptive statistics.

**Focus groups.** Focus groups collected more qualitative responses from students by asking open-ended questions. These leading questions focused primarily on students' feelings about the treatment, math, and the relationship between school and their futures and responses were analyzed thematically.

**Student work.** Student grades were tracked to see if there was a change in achievement during the treatment. Grades changes were assigned to three categories: no change, an increase, or a decrease. Student work completed for the treatment such as students' stated goals, their sub-goals, and their reflections on the mathematics class were collected and analyzed thematically.

## **Results**

### **Pre-Survey**

The first item on the pre-survey had students identify whether they believed math related to their future goals. 67% of participants responded that math was related to their future goals. For the second item, students identified whether the specific class related to their future goals to which 67% of participants indicated yes. There were four participants who believed neither the class nor math in general related to their future goals.

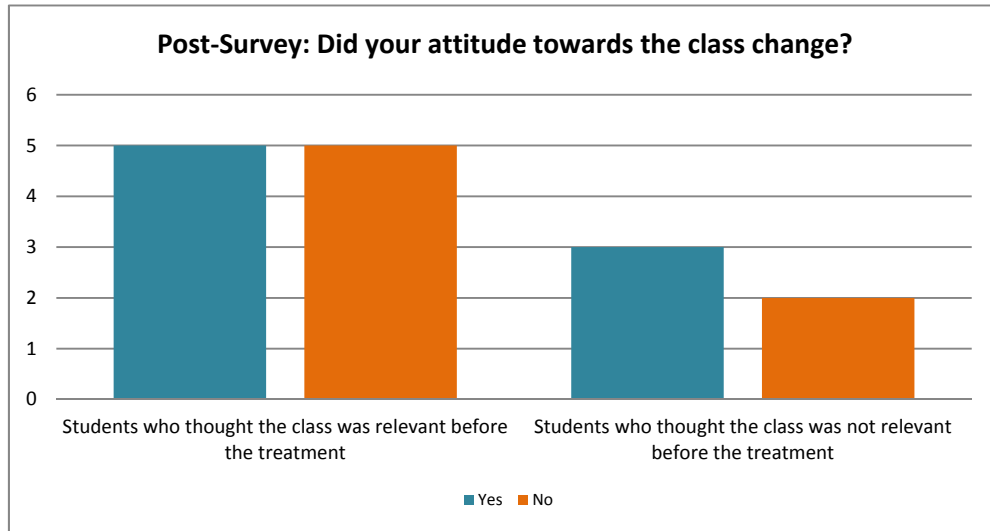
### **Treatment**

Overall, participants identified many common goals. Shared goals were graduating, going to college, pursuing a career, and having a family. There were also similarities with sub-goals. Participants believed that in order to reach their future goals they need to study, pay attention or focus, work hard, get good grades, and/or pass the current class.

## Post-Survey

The first item on the post-survey required participants to say whether they found the activity to be helpful, to which all participants replied “yes”. The next question asked whether other students would benefit from doing the activity and all but one participant said that they would.

The third item asked whether the activity changed their attitude towards the class. The following graph displays their responses. The left blue bars show the participants who said that the activity changed their attitude towards the class, the right orange bars show those who said it did not change their attitude. The two who did not believe the activity changed their perspective still gave positive indications of the effect of the activity in other measures, such as student work and focus groups.



The final question regarding the relationship between math and their future had similar results. However, the participants who answered “no” on both the pre- and post-survey gave no indication that math related to their future in other measures.

## Focus Groups

**Importance of Math.** Most interviewed students agreed that they viewed math as relevant to their future before. Although they already saw math as connected, they believed that the activity reinforced its importance and make the connection to their future more explicit. Students indicated that they had never thought about these connections until they did the activity.

**Perspective on the Current Class.** Students responded that the activity did significantly impact the way they viewed the class, especially with regard to the importance of performing well in the class.

**Motivation and Sub-goals.** Students believed that the activity increased their motivation to work by seeing that it was important and changing their attitude. It also changed their behavior by encouraging them to “come to tutoring” and “put in more effort”. Students found that identifying their sub-goals was both helpful and slightly overwhelming. In general, this was not something they had done before.

### **Achievement**

Out of the fifteen participants in the study, ten participants improved their achievement on tests. Two participants’ achievement remained the same; three participants’ scores decreased.

### **Discussion**

**Relevance.** Compared to the study by Kadlec and Friedman (2004), the participants in this study identified math as relevant more frequently. However, students had not previously gained a depth of understanding about the particular ways math could be relevant. Although they knew theoretically that math was important, they had not made the explicit connection between math and their future. Students need more than broad, sweeping statements about the relevance of math; they need specific examples of careers or jobs that involve mathematics. While it is true that students identified many of the same goals, it is still an important step for them to think about these goals personally.

**Motivation.** In line with what Zaleski (1994) found, once the students identified their future goals, there was both a recognition of the need for more persistence and a tangible result in greater persistence. Likewise, after constructing their sub-goals, students realized the centrality of study habits to reaching their goals, in line with DeVolder and Lens’ research (1982). Students enthusiastically indicated that their motivation had increased as a result of the treatment during the focus groups. One implication is that students might benefit from doing a similar goal-setting activity at the beginning of the year, and continue charting their progress towards their goals during the course of the year with periodic opportunities for reflection.

**Achievement.** Similar to the findings of Malka and Covington (2005), students began to connect achievement in the present math class after seeing the importance of their future goals. Then, that connection resulted in an actual change in achievement for many students.

**Limitations and Future Research.** The main limitation of the study is the small sample size. The treatment was relatively short due to the limitations of the curriculum and the amount of time available. Participants likely would have benefited from a more in-depth reflection on their goals and more direction connecting the class to their. Researchers could explore the relationship between identifying personal goals and tracking them throughout a school term to evaluate its effect on achievement and motivation.

### Conclusion

The present results suggest that students benefit from identifying their personal, future goals, establishing sub-goals and reflecting on this process. Students benefit by seeing the class and math as increasingly relevant to their lives, experiencing increased motivation, and enjoying a higher level of achievement.

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# **The Effects of Humanistic, Research-based, Anecdotal Science Instruction on Biology Students' Identity in Science**

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June 2012

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There is evidence that suggests that science identity formation is affected by students' understanding of the nature of science (NOS) (Shanahan, 2009). Historically, teaching methods have failed to provide students with robust understandings of the NOS. Instead of recognizing the discipline as collaborative, tentative and context-bound, students are repeatedly exposed to science as objective and view scientists as working in isolation (Lederman, 1998; Milne, 1998). In this research I proposed that anecdotal biology instruction, which incorporated characteristics of science stories, would positively affect conceptual change about the NOS. Through exposure to lessons about scientific research that accurately reflect the NOS, I predicted that students would confront their misconceptions about science and, as a result, express greater identification with science. Therefore, this study sought to address the issue of students' science identity, or the degree to which students conceived of themselves as being capable of participating in the scientific enterprise.

## **Literature Review**

Traditional science teaching methods have fostered misconceptions about the nature of science (NOS). Lederman (1998) argues that science has been obscured as a "way of knowing" in favor of a regimen of fact memorization. He proposes that the NOS and scientific inquiry are both foundational components of science subject matter that should not be divorced from discipline-based content. Relevant to this study were aspects of the NOS concerned with how scientists develop their understanding of the world through accumulating evidence and forming explanations, the social/collaborative nature of scientific exploration, and the tentative nature of scientific explanations.

The meaning and relevance of scientific discoveries, according to Rudolph and Stewart (1998), are often distorted when they are taught in a way that removes ideas from their historical and philosophical contexts. A more adequate conception of the NOS, Rudolph and Stewart suggest, would be formed if students were informed of how discoveries were received in the

context in which they originated. Other research even further emphasizes the need for science education that highlights the context-based and humanistic nature of scientific inquiry (Stinner, 1995).

In the science classroom, much of a student's experience with science content can be thought of as occurring from an abstracted perspective. Students perceive of science as a discipline to be learned or observed rather than an enterprise in which they can contribute and participate. Students, from this perspective, identify with science when they recognize the roles and experiences of scientists as being accessible and incorporate them into their own understanding of being in the world (Kozoll & Osborne, 2004). Therefore, the degree to which a student identifies with science could be described as the degree to which he or she understands the NOS and uses that understanding to develop a worldview informed by the scientific enterprise.

Students, according to Archer et al (2010), fell into two major categories: those who perceived of themselves as “doing science,” and those who perceived of themselves as “being scientists.” Positive attitude and higher interest were identified among students who fell into the latter category, clarifying the importance of fostering student science identities. Archer (2010) and colleagues also proposed that students identify with science to the degree that they recognize the characteristics of scientists as socially acceptable. In addition to social acceptability, students have also been shown to place importance on personal relevance when forming a science identity (Schreiner and Sjøberg, 2005). Shanahan (2009) argues that science education that presents a limited or naïve view of the NOS, particularly that which underemphasizes the creative aspect of science, negatively affects students' identification with science. This could be explained, using the social framework provided by Archer and colleagues, as one case in which students fail to recognize creativity, a socially acceptable trait, as being part of scientific exploration, and as a result choose not to identify with science (2010).

While little research has examined the impact of specific instructional strategies on students' science identities, a number of studies have shown that case studies and science stories show promise as means for confronting student misconceptions about the NOS. Clough (2011) reports on a science curriculum that used short stories to accurately address the nature and history of science. These vignettes were shown to produce more nuanced conceptions about the key roles of creativity, invention, cultural context in scientific investigation. Tao (2003)

observed that peer-collaborative discussions of science stories led to conceptual change and fostered the formation of shared understanding. While the stories were designed to foster conceptual change, students often place inordinate emphasis on small details of the stories which led to further confusion about the NOS. These findings suggest that instruction about the NOS needs to be guided intentionally by instructors.

Having explored the role that an understanding of the NOS plays in forming a science identity and having defined what it would mean in this study for students to identify with science, it remained to be determined how anecdotal lessons that incorporated elements of science stories might be used to encourage identification with science. This study incorporated elements of science stories into classroom instruction in order to provide explicit instruction about biology targeted at confronting student misconceptions about the NOS. I developed and taught a number of anecdotal science lessons. These lessons employed effective elements of science stories identified by Milne (1998) and Klassen (2009), but were taught in the explicit, anecdotal style that Lederman (1985; 1998) suggests is effective in addressing misconceptions.

### **Methodology**

This study was conducted using an action research approach in two honors biology classrooms. Thirty-five students of both genders and diverse racial groups participated. Preliminary surveys were distributed geared toward assessing the extent to which students identified with science and understood the work of scientists. The survey included both quantitative (Likert) and qualitative (free response) items. These surveys were followed by a month of instruction on cell and molecular biology, in which four lessons were taught using the anecdotal style to address the NOS. These lessons incorporated authentic science research to show the collaborative and humanistic nature of science. Students were video recorded as part of my student teaching experience, and footage from the recordings was used to observe students' behavior and participation during the instructional interventions. After the instructional unit, video recordings were reviewed and I characterized students' interaction with the content and behavior during class. After the instructional unit, open-ended interviews were conducted with five students. These served the purpose of gaining a more nuanced understanding of students' especially positive or negative views of science and the instructional method used in the intervention. Other questions inquired about the NOS, and served the purpose of determining whether conceptual change about the NOS affected students' science identities. All students

completed post-surveys that were compared to initial data to quantify changes in beliefs about the relevance of science.

## Results

The data showed two major trends. First, from the whole-class standpoint, humanistic, research-based instruction did not significantly impact the extent to which students identify with science. However, when considering individuals, some students expressed more nuanced views about the nature of science and conveyed stronger science identities after instruction with the experimental methods. For all Likert survey items, there was no evidence for significant changes in students' perceptions of science. While there were no significant changes it should be noted that students' responses for many items did show net change toward greater identification with science. Free response items indicated that students' understandings how individuals participate in science were largely bound to careers and classroom behaviors, although there was some recognition that everyday life experiences could be considered as engaging with science.

Interviews were especially useful for gaining more information about students' ideas about what it meant to identify with science and for diagnosing science identification. Some students associated identifying with perceived relevance and interest, while other suggested that a science identity was better defined as adopting a certain way of thinking about the world. Based on students' own definitions of science identification, every student interviewed claimed to identify with science. In most cases, students grasped the relevance of science, recognizing that it was important to understand science in order to make informed decisions and evaluate the findings of other scientists.

Students' reactions observed from video recordings conveyed science identities, even if students were not always conscious of this relationship. Students demonstrated their identification with science through incorporating their own experiences into their discussions of scientific topics. In the class's study of DNA, numerous students expressed views about the discovery of DNA's structure that exemplified mature conceptions of the nature of science. Many students recognized that the discovery resulted from the work of many scientists, and most recognized the importance of the particular historical and social contexts in interpreting the events. In a final activity, students developed personal opinions about ethical issues in biotechnology. Their willingness to form and revise opinions showed a strong degree of idea ownership and personal commitment to the scientific enterprise.

## Conclusion

Results suggest that research-based instruction that reflects the humanistic nature of science positively affects students' science identities. While quantitative data showed no significant gains, the data from this study suggested a shift in a positive direction, which indicates that students viewed science through a different lens. While some common misconceptions persisted about the relevance of science apart from school or science-related careers, students' actions and communication during class conveyed a desire to understand how scientific discoveries relate to their own experiences of the world. The attitude shifts observed in interviews and classroom observations indicated a desire to take on the role of a scientist and to engage with real-world problems from a scientific point-of-view.

Notably, students demonstrated science identities through their expressed willingness to engage with science, whether formally or informally, in the future. Survey responses revealed trends toward increasing interest in science and a desire to research scientific ideas to stay informed about current events. Combined with interview responses where students described their desire to explore science more in-depth, and behaviors indicative of personal relevance and idea ownership, these data suggest that the NOS exposure given in this class was instrumental in leveraging students toward further exploration in the future.

For educators, these findings highlight the importance of instruction about the NOS and the utility of anecdotal, research-based approaches as a tool for confronting misconceptions. In agreement with Liu and Tsai's (2008) findings about the persistence of naïve views, this research shows necessity of confronting misconceptions early – perhaps even before students reach high school. Indeed, if students enter content-intensive courses like high school biology with already matured beliefs about the NOS, then their experience of science at this level may be more easily incorporated into their mental framework for engaging with and thinking about the world.

It is worth noting that one variable was left largely underexplored in this study. Archer et al (2010), and Kozoll and Osborne (2004) both stress the importance of recognizing socially acceptable roles and traits when developing science identities. However, in this study, little attention was paid to identifying what characteristics my own students valued before developing my instructional methods. It could be expected that further investigation on this subject may have better guided the development of lessons suited to the unique goals and assumptions of my

students, rather than targeting broad and perhaps stereotyped misconceptions developed from exploring prior research in the field.

In summary, humanistic, research-focused instruction heightens students' awareness to the actual work scientists perform and enables them to recognize ways in which science both affects and is part of their own experiences. Effective NOS lessons should be informed by students' unique values and should reflect the diversity of scientists both in terms of culture and profession. By offering students opportunities to explore the context in which science takes place, we provide them the chance to explore how science shapes their horizons and how they can perform the work of scientists in ways that are culturally relevant and responsive to their values and needs.

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## Fostering Proactive and Sustained Student Engagement in Poetry

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June 2012

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### **Introduction**

Poetry so often seems dead to high school students because it so seldom reveals the lively humanity that the directness of nonfiction and the narrative nature of many works of fiction show right away. Certainly it is not the case that poetry is any less potent or full-of-life than prose; the trouble comes in the approach. Teachers may feel more intense dread about the poetry in the classroom than their students do. When it comes to the poetry unit, a common approach among students and teachers alike is to grin and bear it, hoping to make it through the poetry gauntlet quickly and unscathed. The unit may as well not have been undertaken if neither student nor teacher is willing to give it the time it deserves. This is not to say that either student or teacher needs to love poetry, but for anyone to say that he “dislikes poetry” is to make a fool’s statement that is already on the lips of a growing population of America’s youth. A student may dislike the poems he has come across but cannot make the argument that all poetry is not to his liking. A truly effective teacher will give students multiple ways into the world of poetry, will scaffold students as they make their way through their doorways of choice. This study suggests a method for fostering student proactivity and increasing engagement in poetry unit both during the unit and afterwards. The method involves granting students a level of lightly guided autonomy for individual exploration into the world of poetry, followed by scaffolded class and small-group discussion that continues to widen and enrich the world of poetry for the students.

### **Literature Review**

Students are desperate to know the meaning of a poem before they have fully read the poem. Previous National Poet Laureate Billy Collins puts the student mindset well in one of his own poems when he states, “But all they want to do/ is tie the poem to a chair with rope/ and torture a confession out of it./ They begin beating it with a hose/ to find out what it really means” (Collins, 1988). Poetry is not bent to the philosophy of finite or exact answers. Hopefully the public school culture is not succumbing to the tendency to think of Education as a well of

answers rather than a guide as to how to ask and pursue the best questions. In discussing student-centered constructivist learning, Joseph Milner argues, “Learning is not waiting for the revelation but making it, not uncovering knowledge but creating it. Learning is active and productive, not passive and receptive” (Milner, 2008, p. 8). In applying this idea to the study of poetry, one should not think of meaning or purpose hiding in a poem or of the potential answer to a test question being obscured by dense language. Such thinking would perpetuate the awful tendency of students to sit outside of a poem and look to extract some particular or exact point. Students who are active and productive in their own education will spend some time inside a poem – they will know the poem well for the sake of knowing it well, with the recognition that the more they put into the poem the more they will get out of it.

Laura Liu suggests that a major impediment to student progress in understanding poetry is the strict tether of the defining of “progress” to quantifiable results or information in education (Liu, 2011). She argues that striking an appropriate balance of standards-based reforms and aesthetic inquiry in the teaching of poetry will be the most successful approach in our current educational climate. Students are certainly not only called to memorize or understand the baseline of course content but should develop their higher-order cognitive skills. Liu follows Linda Darling-Hammond’s concern that “We’re still having our kids bubble in multiple choice test items, which focus on recall and recognition rather than these higher-order thinking skills” (Liu, 2011, p.3). Liu suggests that poetry is a key form for delving deeper and developing such cognitive skills.

Christopher Greig and Janette Hughes take a close look at an impediment to studying poetry that is often overlooked: the emasculating stigma attached to liking poetry (Greig and Hughes, 2009). Even teachers and educational researchers who are looking specifically to increase or encourage reading ability and enjoyment for boys eschew poetry in favor of non-fiction and fiction with a practical bent. Of course, just because poetry is errantly deigned emasculating for boys does not mean that girls highly favor the form. There is widespread disengagement in the subject of poetry across the board.

Considering poetry’s long aural history (particularly in forms conducive to story-telling, such as epic poetry), it is more than appropriate that teachers would make efforts for poetry to be read aloud, recorded, played, performed, or even put to music in the classroom. The auditory presentation of poetry in the classroom appeals to different parts of cognition that are underused



in education, particularly aspects of spatial reasoning as well as verbal and elocutionary analysis (Gordon, 2010). Matthew Thibeault suggests that recording students' own recitation of poetry will increase their understanding and compound their level of engagement (Thibeault, 2011). While such an approach is not a new concept, it is certainly underutilized, and current application of the technique is incredibly useful in increasing the educational impact of poetry in and out of the classroom.

Even with the shortest poems and poems with the most simple language, poetry can be very difficult to comprehend. With many of today's classrooms and entire schools being filled to bursting with students, teachers may frequently find themselves in the predicament of having the need for individual and differentiated instruction without the ability to achieve such instruction. As Linda Darling-Hammond notes in *The Flat World and Education*, "A number of studies have found that, all else being equal, schools have higher levels of achievement when they create smaller, more personalized units in which teachers plan and work together around shared groups of students and common curriculum" (Darling-Hammond, 2010, p. 239). Coupling full-class engagement of poetry with small-group and individual engagement of poetry within one unit or across one semester will increase the effectiveness of instruction several times over.

Even the content of poetry units is too often stunted. There are libraries full of accessible, powerful contemporary poetry, and much of it is not being accessed. Bob Broad and Michael Theune have undertaken an empirical inquiry in order to assess how contemporary poetry is viewed in today's society. One aspect of their findings suggests that people look for poetry that stands out from its background – poetry that breaks convention or takes an exciting approach. Contemporary poetry offers a wider swath of poetic approach, and the more doors into the subject afforded the students, the better the hopes for student engagement and success (Broad and Theune, 2010). It is unlikely that more contemporary poetry will flood into the curriculum until students have a greater understanding of long-standing poetry in the canon. Powerful and potent contemporary poetry should not be excluded, but all too often is simply by this notion. Marilyn Singer argues for "knocking poetry off the pedestal" (Singer, 2010). Too often poetry is seen as a lofty art, an unapproachable form. Singer's research espouses the idea that poetry should be a part of the regular class day – she shows that poetry is potent enough that familiarizing the students with it will not make the form a flat thing, but will provide more opportunity for students to delve its depths.

## **Methodology**

The study was undertaken in a ninth-grade standard English class of twenty-eight students over the span of one week (with a weekend of light prep-work). In the week before the poetry unit, these students were informed that the new unit would begin on the following Monday. Each student received a twenty-four poem compilation of poems by a mixture of classic, romantic, modernist, and contemporary poets. They were instructed in the last twenty minutes of class time on Friday to look through the length of the packet and voice any questions or concerns. The students then were to take the packets home over the weekend to continue to peruse the poems, picking their favorite. Through the week, students would revisit their chosen poem, analyze it with a peer, analyze it with a small group and return to the packet later in the week for examples of different form and style. Students would also compose two poems and write two to three drafts for both: the first poem being an “I am” poem and the second being either an unscaffolded poetry assignment or a biography poem, given each student’s choice. Student participation in discussion and homework would be used to monitor and assess their engagement and proactivity.

## **Results:**

Before the poetry unit (and the study itself) began, the students were generally pessimistic about the unit. However, the students responded positively to the poetry packet and the freedom of exploration that came with it. Student enthusiasm and engagement levels were higher when given assignments where they were given more control or a greater degree of autonomy to explore. On top of this finding was the fact that the students would exercise more autonomy to explore the content of the unit more deeply as the unit moved on. They grew in confidence and enthusiasm, both of which worked to dispel what preexisting negativity they harboured about poetry. Student discussion was thin and timid on Monday but boomed on Thursday, when they were doing essentially a revisionist take on the same pedagogical concept (exploring poetry collections and then sharing and discussing the poems found). As for compose-to-comprehend, students were timid as well when writing their “I am” poems but went about the second composition assignment with little or no hesitation.

## **Discussion:**

While more research is certainly necessary, this initial study shows some hope for the revival of high school student engagement in poetry. Poetry is an incredibly valuable form, and its value cannot be cut away and grafted to another area of literature. Students will be more likely to have a lasting care for poetry if they are encouraged to explore the form for themselves.

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## Tracking Talk: Is Dialogic Instruction Differentially Viable Across Academic Tracks?

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June 2012

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Within a constructivist paradigm, it is difficult to overstate the importance of classroom discussion to English teachers. Through a cooperative process of meaning-making, classroom discussion of literature and other English language topics promises to unfold understandings between students and text and between students and students. It is, therefore, of paramount importance that English teachers make the most of their discussion time. This study explores one model of classroom discussion, Martin Nystrand's "dialogic discussion," and asks why this effective pedagogy is more common in higher-track classes than in lower-track classes.

The unequal prevalence of dialogic instruction in lower-track classes may be of particular concern, quite aside from general implications for instructional efficacy and equality, to scholars with an interest in critical literacy. Nystrand's theory derives from the work of Russian literary critic Mikhail Bakhtin, and Bakhtin's work arose, in part, in response to the totalitarian discourses of the Russian Orthodox church and the Soviet Union. Bakhtin saw in each of those institutions a single voice that would assert itself as the *vox* of unchallengeable truth, much in the same way that traditional teachers have asserted their own 'unchallengeable' expertise in the classroom. Bakhtin's dialogism sees language, instead, as inevitably "multi-vocal," a system in which speech is inevitably woven of multiple threads representing the linguistically-vectored philosophies, perspectives, and ideologies of its speakers. Speech is situated in conflict with itself, and speakers are always negotiating conflict between themselves, because the negotiation of meaning is also necessarily the negotiation of ideology, philosophy, perspective. The dialogic classroom, then, not only raises scores on the usual metrics of English achievement, but it also helps students, by promoting open discussion, to become aware of the variously charged threads of language in which they are necessarily situated. This is a timely and useful skill, in a country and an age when most conflicts have been transposed from physical mediation to mediation in discourse, and so the question of why this type of instruction is being withheld from lower-track students assumes a particular salience.

**Review of Extant Research.** The practice of “tracking”—*i.e.*, the practice of placing students into classes on the basis of their expected occupations or their perceived academic ability—remains entrenched in American secondary schools despite overwhelming empirical evidence of its negative consequences (Oakes, 1987, pp. 129-30). Indeed, critics impugn the practice, among other reasons, because it exacerbates the disadvantages of already-disadvantaged students. Gamoran and Mare (1989), for instance, conducted a well-known quantitative analysis, finding that “tracking reinforces initial differences [in achievement] among students assigned to college and noncollege curricula. Moreover, tracking widens the gap in achievement and in the probability of graduating between students of high- and low-SES [socioeconomic status] backgrounds” (pp. 1176-77). While that study did not draw conclusions regarding the mode by which tracking exacerbates educational inequality, other studies have attempted to do so: Carbonaro and Gamoran (2002), analyzing the effects of four dimensions of instructional quality on English achievement, concluded that “differences in instruction partially explain why tracking tends to lead to unequal outcomes for students and why students with higher socioeconomic backgrounds tend to have higher levels of achievement than students with lower-SES backgrounds” (p. 821). Indeed, an earlier study, by some of the same authors and focusing more explicitly within that rubric, supports a more specific conclusion. The authors of that large-scale observational study concluded that “the findings indicate that high-quality instructional discourse—characterized by student participation, coherence, discussion, authenticity, and uptake [*i.e.*, conversation builds on the ideas of conversants]—can improve student learning when it occurs in the context of substantive academic content” (Gamoran, Nystrand, Berends, & LePore, 1995, p. 708); however, the authors also found that rates of discussion were higher in higher track classes and that this difference contributed to learning gaps. Taken together, the preceding studies suggest that one mode (among many) by which tracking exacerbates inequality is differential instruction relating to classroom discussion.

One paradigm for understanding how classroom instruction relates to classroom discussion is Martin Nystrand’s (1997) theory of “dialogic discussion.” Inaugurated in Nystrand’s monograph *Opening Dialogue: Understanding the Dynamics of Language and Learning in the English Classroom*, dialogic instruction applies the theoretical apparatus of Russian literary theorist Mikhail Bakhtin to classroom discourse. Nystrand writes, “Bakhtin teaches us that meaning and therefore learning—understood as the expansion of a personally

coherent interpretation of information and events—are actively constructed and negotiated through language use” (p. 73). However, some modes of classroom discourse impede this constructive process. Nystrand distinguishes between “monologic” discussion, which he disfavors, and “dialogic” classroom discussion, which he advocates.

Monologic discourse is characterized by a single authoritative voice (the teacher’s) controlling all dimensions of classroom talk. Nystrand strongly associates monologic classroom discourse with Mehan’s I-R-E pattern of classroom recitation, in which student talk is entirely constrained by the teacher’s initiative questions and evaluative responses (Mehan, 1979). Nystrand also associates monologic classroom discourse with Freire’s (1970) “banking” model of instruction, in which students are seen as passive receptacles into which teachers make “deposits” of absolute knowledge and expertise. For Nystrand, monologism represents, essentially, a solipsistic discourse mode, in which the teacher effectively speaks only to herself while student responses serve merely to ‘fill in the blanks’ of that solitary speech. However, since, under a Bakhtinian rubric, meaning is constructed socially, in dialogue with other minds, Nystrand doubts that this mode of classroom discourse facilitates substantive engagement with the curriculum or that it encourages students to make meaning for themselves.

In contrast to monologism, Nystrand advocates dialogic classroom discourse. Since Nystrand is the originator of this theory and since he does an especially nice job summarizing his theory of dialogic discussion, it is worth quoting him at length: “[D]ialogically organized instruction provides public space for student responses, accommodating and frequently intermingling teacher-student voices representing differing values, beliefs, and perspectives, and ideally including the voices of different classes, races, ages, and genders. Dialogically organized instruction is fueled by such pluralism and heteroglossia, and the extent of social interactiveness clearly shapes both instruction and learning... In dialogically organized instruction, teacher-student interaction extends to the substance of the discourse, so that multiple perspectives offered by teacher, students, and course readings all affect the shared understandings that the class collectively negotiates” (Nystrand, 1997, p. 18).

While Nystrand suggests that group work and even individual student-text ‘dialog’ may unfold dialogically, the major implications of his theory apply to whole-class discussion. In a study conducted following the publication of his 1997 monograph, Nystrand and colleagues refined the evidences of dialogic instruction thus: Dialogic instruction entails *open discussion* (a

“free exchange of information among students” lasting a non-trivial duration), *authentic questions* (questions “without pre-specified answers that the teacher is seeking”), and *uptake* (teacher and student responses build on what previous speakers have said) (Applebee, Langer, Nystrand, & Gamoran, 2003, p. 700). The discourse “moves” by which a teacher or student attempts to initiate dialogic discussion, Nystrand calls dialogic *bidding* (Nystrand, Wu, Gamoran, Zeiser, & Long, 2003).

Within this framework, the present study sought to explain documented differences in the inter-track use of dialogic instruction (it is almost never used in lower-track classes) by examining whether this instructional method is differentially viable across academic tracks.

**Methodology.** This was an action research study, conducted concurrently with the researcher’s student teaching internship. The researcher audio recorded himself leading whole-class discussions both in advanced-track classes (AP Language and Composition) and in a lower-track class (inclusion English III Standard). Five recordings of the advanced-track class and six recordings of the lower-track class were obtained. The researcher then transcribed these audio recordings, eliding any student-identifying information, and analyzed the resulting typescripts for authenticity, uptake, and openness of discussion (Nystrand’s criteria), in order to assess whether dialogic instruction was differentially viable across tracks.

**Results and Conclusion.** Analysis of five discussion fragments from the advanced-track classes in the full paper, together with the many more pages of transcriptions, suggest that dialogic instruction is essentially viable in upper-track classes, *i.e.* that authentic questions and uptake evoke dialogic exchange fairly consistently, subject to operational variations and other exogenous variables. It was observed that thoughtful sequencing of the authentic questions could increase the likelihood of meaningful and responsive dialogue and that instances of non-responsiveness often reflected on exogenous factors or ineffective dialogic instruction.

A danger of dialogic instruction in advanced classes deserves investigation in future studies: The problem of classroom ‘superstars.’ The researcher observed that, often, a handful of especially bright and vocal students were able to dominate the discussion, and, while the discussion itself was dialogic, the number of students actively participating in that discussion was less that could be desired. The problem extends beyond mere personal dominance; at times, the classroom ‘superstars’ were able to push the level of discussion into such levels of abstraction that, it is hypothesized, many of their peers were unable to understand and



participate. *Prima facie*, the only remedy for this problem would be for the teacher to intervene into the substance of the discussion and redirect talk onto more accessible avenues; however, doing so is quite at odds with the aims and methods of dialogic instruction. Thus, the problem of addressing classroom superstars remains outstanding for further research.

Working with the lower-track class, the researcher found, in summary, that dialogic instruction is indeed viable, but that navigating an optimal balance between open discussion (which frees student voice and energizes the classroom) and order (which keeps discussion on topic and controls side-chatter) is the principal challenge to implementing this instructional method. The need for skillful implementation, however, does not undermine a claim of viability, as this study understands it: skillfully administered, authentic questions and uptake did indeed catalyze dialogic discussion in the lower track class.

This study sought to determine whether dialogic instruction was differently viable across academic tracks, in order to account for the documented fact that this instructional method is far more prevalent in advanced classes than in lower-track classes. The data of the present study definitely do *not* support a claim that dialogic instruction is unviable in lower track classes, because the researcher, on multiple occasions, used authentic questions and uptake to provoke dialogic exchange in the lower-track class. However, this study does support a contention that the conditions for dialogic instruction's viability are indeed different across tracks: In the AP classes implementing dialogic instruction required cultivating an atmosphere of open discussion and thoughtfully sequencing authentic questions in order to draw out student voices, which voices have been socialized by the school system to sit passively and silently. In contrast, it was unnecessary to draw out student voices in the lower-track class, where the challenge was rather to direct an overabundant tide of voices into productive channels. Implementing dialogic instruction in the AP classes was a challenge of stimulating student talk; implementing dialogic instruction in the standard class was a challenge of attenuating student talk. The principal risks to using dialogic instruction in the advanced classes were that student talk would drift into unproductive avenues and that a few 'superstars' would make the conversation inaccessible to a majority of the class; the risks to using dialogic instruction in the lower-track class were that decorum would break down and class devolve into small-group chatter.

Given these observations, it is possible to understand—though not to endorse—teachers using this instructional method only in advanced classes. The American educational system is

steeped in a teacher-centered ethos in which an excess of student talk is viewed as a far greater ‘threat’ than hours of classroom silence, and so teachers are perhaps willing to risk tangency and ‘superstardom’ in advanced classes but not to risk devolution into uncontrolled student talk in lower-track classes.

This pattern, if true, is regrettable, however. The strong impulse to talk and to negotiate meaning socially that the researcher observed in the standard class is a sort of educational natural resource that is presently going untapped. At a time when the educational establishment is seeking to develop means to engage at-risk students in school, further research into methods for channeling rather than squelching students’ dialogic impulses would be timely and helpful. In particular, analysis of this study’s recordings suggest that the tendency in the lower-track class to devolve whole-class talk into small-group talk might be pedagogically useful, if only a means can be found to ensure that the small-group talk remains curriculum-relevant. It is suspected that an optimal pedagogy for discussion in classes similar to the lower-track class in this study might entail switching frequently from whole-class to small-group talk, ‘priming’ the class with authentic questions and uptake and then releasing them to talk freely for a brief interval.

In any case, teachers should not abandon dialogic instruction in lower-track classes. Dialogic discussion in lower-track classes may not look like the decorous forum of an AP class, but it has been the experience of the present researcher that, once a teacher has braved the initial shock of releasing student talk from the yoke of draconian classroom management and once a teacher has adjusted himself to a certain degree of productive chaos, the conversations that ensue can be highly authentic, grave or humorous, energetic, profound—but above all meaningful and memorable for both students and teacher.

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# Teaching Short Stories: Scaffolded Learning in the High School English Classroom

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June 2012

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It is an undeniable fact that in the modern world, the well-creased book has given way to video games, teen magazines, and social networking. The immediacy of technology is accompanied by students more savvy than ever, students who are communicating with one another constantly and are used to having their opinions heard on their Twitters, blogs, and texts. The modern classroom needs to adapt to this new empowered student. Teachers must guide students to claim ownership of their learning and their thinking in school, just as they do outside the classroom. This can be achieved by discouraging teacher-centric classroom activities and by promoting student individuality and personal effort by working in small, teacher-free groups.

What teacher has not wondered if small groups are truly effective? The process itself is often less organized than whole-class activities, but students have positive attitudes toward this type of work, and collaboration in an intimate setting may improve student thinking and allow more students to engage with classwork (Davies, 2009; Nystrand, Gamoran and Heck, 1992). Still, especially since classes vary so widely from one another, it is unclear if this classroom style facilitates learning or stifles it, especially in the tenuous and often difficult-to-measure realm of reading comprehension. This study addressed the difference between whole-class and small-group work and determine which, in a high school English classroom, best facilitates learning.

## Review of Literature

Learning that is scaffolded for students, allowing them to work with one another to go beyond their personal academic capabilities, is an essential classroom practice. After studying 200 eighth and ninth grade classes over the course of two years, Nystrand, Wu, Gamoran, Zeiser and Long (2003) found that lower-level classes, who stand to gain the most from open, scaffolded instruction, receive the least of it: student-generated dialogic spells, periods when discussion is generated and led forward by students, were almost nonexistent in low-track classes. Working communally and openly discussing texts is important to maximize learning, and Newell (1996), in studying two tenth-grade English courses that used both teacher- and

student-centered discussion tactics, shows that while both small-group and whole-class activities are useful tools to improve student learning, each is most beneficial when centered on students.

Whole-class discussions can, when orchestrated correctly, be highly effective. They promote the active production of ideas and more closely resemble conversation, making students more comfortable and therefore increasing their likelihood of participation in classroom discourse (Nystrand, Gamoran, & Heck, 1992). Students respond best when discussing topics they are interested in, as King (1990) found in her study of 40 students. Half were trained to generate their own questions using stems, such as “Explain why...” or “How does... affect...?” while the other half received no special instruction. Students whose discussion revolved around the student-generated questioning provided much more elaborate answers and demonstrated higher comprehension during class during discussion and on the posttest than those that received no instruction on discussion techniques. The use of a technique such as King’s helped structure the group discussion to create a learning environment that encouraged elaborate, thoughtful responses from students, and decreased the likelihood of no student response at all (King, 1990).

Though whole-class discussions can produce great intellectual fruits, small group discussions can be just as effective, though they require the teacher to relinquish much of her control over the classroom. They promote deep thinking, active and experiential learning, the construction rather than mere reception of knowledge, and being able to work effectively in groups is an important life skill (Davies, 2009). Additionally, working with students of different academic levels helps students support one another academically, and it also increases the classroom success of lower-level students. When working in small groups, confused students receive immediate and focused attention, something unfeasible in a whole-class discussion.

A gap in research exists concerning the comparison between whole-class or small-group discussion, the effectiveness of which can be easily studied when approaching a short piece of literature. This study will therefore look at whether a scaffolded, teacher-led, student-centered discussion is more effective than scaffolded, student-led small group work. Since research shows that students respond best when give the most autonomy in what they talk about, both groups will generate their own discussions using question stems, and this study sought to determine which method – using this technique in small student-led or large teacher-led groups – improves student comprehension of a short story.

## Methodology

This study used scaffolding to improve student performance and coupled it with strategies initiated by Nystrand, Wu, Gamoran, Zeiser and Long (2003), who found that the most positive results came when students responded to one another and asked their own questions to one another. Students used question stems adopted from King (1990) to create discussion questions that centered on their own concerns, since successful classroom discourse needs to promote student engagement and focus on student-centered topics and questions.

The study took place in the high school English classroom in which the researcher had been teaching all semester. Two sections of her standard English I classes were studied: her first period class broke into small groups, and her second period class used whole-class discussion. Students signed assent forms and their parents signed consent forms. Each half of the study took place during one 90-minute class period, which was recorded with permission of students and parents. Both classes read and discussed Ray Bradbury's *All Summer in a Day*, chosen for its high-interest content, its brevity, and its Flesch-Kincaid grade level score of 3.1.

In the first class, the small group discussion, the teacher began by breaking the students up into mixed-ability groups. Jones and Carter (2006) showed that grouping high- and low-ability students increases all students' performance. In this table that shows the groups, high

<b>Group 1</b> (L, D) (L, C) (H, C) (H, D) (H, C)	<b>Group 2</b> (L, C) (L, D) (H, D) (H, D) (H, C)
<b>Group 4</b> (L, C) (L, D) (H, C) (H, C)	<b>Group 3</b> (L, C) (L, D) (H, C) (H, D)

performing students are denoted by "H," lower-performing students by "L," students who worked conscientiously by "C," and easily distracted by "D." These categorizations are based upon researcher observation of the students in the months preceding the study, academic performance, and field notes.

The students read the story out loud in their groups, stopping at designated points to talk about what they had read using Beers' "Say Something" starters, which give students a jumping-off point to pause while reading and make comments or ask questions about the text (2002). After reading the story, the students were given the set of question stems adapted from King and a structured note sheet. They wrote their own discussion questions using the stems and then, at the prompting of the teacher, spent twenty minutes asking and discussing their questions in groups and taking notes on what other group members said. Finally, students took a twelve-question quiz that contained factual recall, thematic analysis, and critical thinking questions.

The second group read the same story but used a whole-class discussion method to discuss it. They also began by reading the story aloud using mostly student volunteers. The teacher stopped the class periodically during reading to discuss the story and check comprehension. After the students finished reading the story, they were given the same list of question stems and asked to write three to four discussion questions about the story. They were next given a similar structured note sheet and began a whole-class discussion. Students posed their questions to the class, answered them, and took notes on the discussion. Finally, this group took the same twelve-question quiz as the last class. All students took a survey at the beginning of the next class about their perceptions of group work, class discussions, and themselves.

### Results and Conclusion

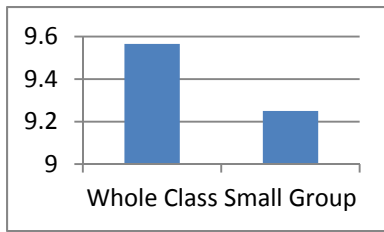
The small-group students did very well in their groups. Despite some chatting, all students completed the tasks at hand with vigor. Everyone read and paid attention to the story, and I received handwritten work from *every* student, both of which are unusual events. I wrote in my field notes that many students “got really into the story and the discussion,” which is in and of itself an indicator that the group work was a success. Many students reported on their concluding surveys that although they did not always like group work, they enjoyed reading this story in groups, perhaps because of the structure provided them during the class period.

This structure worked well. The “Say Somethings” and question stems successfully encouraged students to provide real insights into the story when reading, and video transcriptions show genuine academic dialogue between students. Like the questions themselves, student comments during discussion that were captured on video or recorded on the note sheets were insightful. Although no student fully completed the structured note sheet, they did write some notes about what their peers said. Examples of comments are below:

“This story reminds him of <i>They Cage the Animals at Night</i> ” (the book we had just finished reading as a class)
“It’s confusing because one minute it’s raining and then they see the sun!”
“I disagree with her prediction that someone is going to die at the end.”
“She’s from Ohio and not she’s on Venus and she’s used to having sun but now it’s always raining. So I think she misses her home and the nice weather there” (P1, L128-130)

The comments students made were insightful and drew from the questions asked as well as the students’ knowledge, and the back-and-forth nature of the conversation evidences student engagement with the story and one another. Students grappled with the deeper thematic issues and demonstrated a profound understanding of the story and its implications.

The second group, who used a whole-class discussion, was much rowdier than the first class, and the researcher noted in the field notes that this was “perhaps the worst day of class of the entire semester.” Students were somewhat engaged when reading the story and wrote good-quality questions, but their whole-class discussion was forced and far less fruitful than that of the small groups. Although the students came up with varied and interesting questions, the discussion was halting and low quality, with students focused on the task of filling up on their note sheets and the spelling of other students’ names rather than with actually talking about the questions being asked. Out of the final 323 lines of transcribed dialogue of the discussion portion of the class, 119 (36.8%) were about something other than the story. Only 20 of the 25 participants turned in the structured note sheet, and all 20 had written the same five questions. Based on what was written on the note sheets and on the discussion, it is clear that the focus was on having something written to turn in without regard for the quality of that something.



The small group class performed slightly worse than the whole-class discussion group (see graph), but the difference is minimal, and this was the only area in which the small-group class performed worse than its whole-group counterpart.

Students in the small groups, as a whole, were more engaged and focused, had greater participation from all students, produced a greater volume of notes and questions per student, and made more plentiful and more insightful comments than the students in the whole-class discussion group. Ten students carried the class discussion for the second group, but almost every student in the small group discussion class contributed to discussions. The small groups had less time to complete their quizzes, and the whole-class discussion group may also have outperformed the other class on the quiz because the teacher, knowing what would be on the quiz, unconsciously primed the students to do well on it.

Most of the results of my study were what I expected. I was unsurprised that the small group discussions fared better than did the whole-class discussion, since studies indicate that small groups are more productive for creating student knowledge than whole-class discussions. There were far more instances of student-student engagement in the first class than in the whole-class group. The students took the assignment seriously and worked hard, including those who are often disinterested in whole-class activities and discussions.

There were, however, limitations to this study that, had I more resources and more time, I would have addressed. Time was a limiting factor. Taking two days of class for the study would have given students, especially the small group class, more time to focus on the work and to complete the quiz more thoughtfully, and I could have given all students time at the end to complete their note sheets. With more time, I would also have been able to conduct a more thorough study. Rather than select one class to be the “small group class” and the other to be the “whole class discussion” class, I would have switched the two classes and re-performed the study with a second short story. This would help determine whether small groups are more effective or if these particular students were simply more inclined toward discussion and participation.

One great conundrum raised by this research, limitations or not, is whether it is better to have most students do all of the work or to have all students do most of the work. I found that on paper, the students in the whole-class discussion answered questions more thoroughly, but in practice, all of the small-group students actually participated and engaged with the text, but in the whole-class discussion, some students were left behind. My results, despite test scores, show that giving students in small groups control over their learning is a powerful way to encourage them to move past normal academic boundaries, since my students were more active and engaged than usual when they worked in groups. The utmost goal of education is to teach students to become independent, critical thinkers, and working with other students in small, carefully selected groups encourages accountability and independence while supporting learning to its fullest extent.

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# **Tools for Thinking: How the Analysis of Primary Sources Influence Students' Critical Thinking**

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June 2012

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History classes in high school tend to focus on factual information and rote memorization which creates a barrier to develop higher-order thinking. Researchers and some history teachers have noted the effective use and analysis of primary sources to bridge this divide (Potter, 2003; Tally & Goldenberg, 2005). Indeed, by utilizing primary sources in the classroom, teachers could potentially foster the growth of critical thinking skills among their students. This study examined the influence that primary source analysis had on critical thinking with a group of 20 high school history students.

## **Review of Literature**

The most consequential role that social studies contributes to students is the development of critical thinking skills. Indeed, without the ability for students to analyze, interpret, and apply what they learn, the other important purposes of social studies cannot be reached as critical thinking is the foundation from which everything else is built (Duncan, 2011; Goldberg, 2011; Massialas; 2009). However, many teachers still focus on rote memorization and multiple-choice testing because of high-stakes accountability, which confines the field of social studies further. (Heafner, 2008; Heafner & Friedman, 2008).

Given the importance of critical thinking to a student's development in education and its definitional ambiguity, decades worth of scholarship exists attempting to explain critical thinking. Ennis (1985) defines critical thinking as "reflective and reasonable thinking that is focused on deciding what to believe or do" (p. 47). Providing a more detailed explanation of critical thinking, Beyer (2008) describes it as analyzing decisions, classifying information, examining to identify cause and effect relationships, evaluating sources for veracity and bias, and noting strengths and weaknesses of arguments.

The idea of using primary sources to foster and develop students' critical thinking skills is not new and a plethora of research on the matter exists. Primary sources are easy to distinguish from other sources as they are defined as the original materials from the time period being

studied and may include: videos, documents, artifacts, diaries, photographs, audio recordings, and letters (Baton, 2005; Library of Congress, n.d.; Potter, 2003; Villano, 2005). The widespread availability of primary sources is due in large part to the Internet and ease to which it is accessible. Eamon (2006) describes the Internet as revolutionizing the way teachers and students can access historical material. He further notes how the Internet allows for “virtual exhibitions” of primary sources where the historical material’s content is maintained for study (p. 304).

Eamon (2006) and Musbach (2001) assert that certain hindrances could stand in the way of effectively employing primary sources. For instance, teachers and students need to be able to distinguish between legitimate archival collections of historical sources and invalid sites. Also, documents or other textual primary material can be difficult to read depending on the time period and if it is translated. Lastly, a teacher must consider students’ varying abilities in what they can comprehend and read which may restrict what sources can be employed.

While primary sources do have their challenges, the educational value of being a tool that can develop students’ critical thinking skills easily outweighs the possible disadvantages. Potter (2003) asserts that the use of primary sources encourages critical thinking because it requires students to consider bias, various points of view, identify events or actions and why they happened, and evaluate the source in terms of validity and reliability. Tally and Goldenberg (2005) write that by examining primary sources, students build critical thinking skills through exploring the varying perspectives found in the historical material. Students then engage “both cognitively and emotionally” with the source then speculate and employ higher order thinking to evaluate it much as historians do (p. 1).

Due to the challenges of working with primary sources and, more importantly, their potential to develop critical thinking skills in students, teachers need to guide and scaffold how the analysis of historical sources takes place (Clearly & Neumann, 2009; Beyer, 2008).

In general, there is no lack of scholarship or debate on the need to develop students’ critical thinking skills. However, these studies and findings often concern student engagement, student interest, or scaffolding models to implement when using primary sources. This study seeks to provide the education community with new scholarship in examining the influence primary sources can have on students’ critical thinking skills.

## **Method**

The participants in this study were 22 students in an eleventh grade U.S. History Honors class who attended a public high school in the south-east region of the United States. There were three main phases that took place during the study: (1) a pre-assessment of students' critical thinking skills when analyzing primary sources, (2) four primary source analysis activities, and (3) a post-assessment of students' critical thinking skills when analyzing primary sources. Before they were given the pre assessments, the primary sources for the activities, and the post-assessment, the historical content where the primary source came from was taught.

Near the beginning of the study, students were asked to complete a pre-assessment on critical thinking skills when analyzing primary sources. This was aligned with the North Carolina Standard Course of Study, and prior to the pre-assessment, critical thinking was explained to the students. The first part of the assessment involved a primary source document: Andrew Jackson's address to Congress about the Bank of the United States (Document E). Students were asked to read the document and then given the pre-assessment analysis sheet. The second part of the assessment involved analyzing a primary source photograph of a painting representing Manifest Destiny (Document F) and completing an analysis sheet for the picture. The questions in these assessments are formulated from research and assessments by Clearly and Neumann (2009), Moss and Petrosky (1983), Thomas (2009), the Center for Teaching and Learning (2005) at Northeastern Illinois University, the Library of Congress (n.d.), and the National Archives (n.d.).

The main critical thinking questions this study focused on were contextualization and evaluation of primary sources. Contextualizing simply means that students would be able to read or examine a primary source and tell why it was created by relating it to the time period and events surrounding its creation. Evaluation means that students can identify and assess the assumption, bias, and overall argument within a source.

After the pre-assessment and during the next several weeks, the students participated in four primary source analysis activities. The primary sources used were photographs, political cartoons, and documents such as speeches and letters. At the end of the study during the 1930s unit, students took a two-part post-assessment which was identical to the pre-assessments given weeks earlier. The data from this study also includes observation notes during the four analysis activities and students' responses to the primary source analysis questions. These data sources

were analyzed using the method of grounded theory and the rubrics produced to assess critical thinking on the pre and post assessments.

### **Results**

After examining the data sources mentioned above, this research study pinpointed two major themes that emerged when analyzing primary sources to build critical thinking skills in students: (1) primary source analysis helped students engage in the critical thinking aspect of contextualization, and (2) the analysis of primary sources improved student's ability to effectively evaluate sources for bias and assumptions.

The students in this study developed the important critical thinking skill of contextualizing primary sources. Both pre-assessments demonstrated students' inability to properly contextualize the information and themes in primary sources. During the four primary source analysis activities that followed and the post-assessments, students improved upon their ability to contextualize primary sources. These students were engaged in inquiry based, contextualization of history as they asked themselves why this was produced, what caused its creation, and how did it connect with historical events and people; thus, demonstrating their ability to use one of the levels of critical thinking.

The evidence from the data collected shows that students were able to engage in the critical thinking process of evaluation at the end of the study. While students showed marked improvement through the analysis activities and on the post-assessment, their overall scores were slightly lower than the contextualization scores. Both of the pre-assessments demonstrated that a majority of students lacked the ability to properly evaluate the sources in terms of assumptions and bias.

The results from the four analysis activities that followed the pre-assessments and the post-assessment demonstrate that students improved upon the critical thinking skill of evaluation. Not only were students able to detect bias and assumptions to evaluate the validity of the source, they began taking it further by asking questions to obtain more information; thus, engaging in the critical thinking aspect of evaluation.

### **Discussion**

This study demonstrated that primary sources and the analysis of those sources is an important and effective tool in the building of critical thinking skills. Part of this lies in what one

may extract from primary sources that are rich in history, detail, and that tell a story from the past that allows for the exploration of historical people, actions, and events.

It is important for teachers and researchers to recognize that primary sources alone cannot allow for the exploration of history and the betterment of students' critical thinking skills; unless, students are provided with some form of historical context, and the teacher is able to scaffold or structure the analysis. Therefore, it is pertinent that teachers provide an overview of the time period that is being studied, so students can engage in the contextualization of the source. Additionally, evaluating a source based on the events and actions of a time period would be ineffectual as, again, students would possess little historical knowledge.

The findings of this study support and reflect previous research on using primary sources to foster and develop students' critical thinking skills such as being able to contextualize and evaluate sources. Indeed, this study advances the notion that through the analysis of primary sources, students can improve upon their critical thinking skills by considering bias, points of view, identifying events or actions and why they happened, and evaluating the source in terms of validity and reliability (Potter, 2003). By analyzing primary sources, students are able to engage "both cognitively and emotionally" with the source then speculate and employ the high order thinking skills to evaluate it much as historians do (p. 1). In addition, students understand the problems of historical evidence by examining the bias and stereotypes that permeate sources which requires them to think critically (Barton, 2005; Tally & Goldenberg, 2005). For students to engage in critical thought requires the utilization of effective and scaffold instruction. Cleary and Neumann (2009) note that providing historical background information on the time period from which the primary source originates is essential for students.

This study not only bolstered the current scholarship on using primary sources to foster critical thinking, but provided both qualitative and statistical data on student growth from the implementation of analyzing primary sources in the classroom. However, there are other questions that could potentially further future research in this area. For instance, within this study, students worked in a teacher led analysis session, in groups, with a partner, and finally alone; therefore, a study that investigates the differences critical thinking growth in comparison to one another could be beneficial. Lastly, future research may want to examine other primary source activities other than analysis sheets that could be used in the facilitation of critical thinking skills.

## Conclusion

Primary sources and the analysis of those sources are effective devices to utilize when cultivating and developing students' critical thinking. However, primary sources cannot stand by themselves and require historical context and a scaffold approach before being employed in the classroom as a tool that promotes thinking. When these two considerations are effectuated properly, students then have the ability to engage in critical thinking through historical exploration by answering questions such as why a source was created when it was, what events may have precipitated its creation, are there examples of bias or assumptions, and, if so, then why?

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# The Use of Hispanic Dance to Develop Cultural Awareness and Language Ability

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June 2012

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The integration of the arts in education is crucial for fostering creativity and allowing students to express themselves. Because the ability to express oneself is a key aspect of foreign language education, the integration of the arts should extend into the foreign language classroom. Learning a language goes hand in hand with learning about culture, and the integration of the arts in foreign language instruction allows students to learn about the importance of the arts in cultures other than their own. The American Council on the Teaching of Foreign Languages (ACTFL) identifies Cultures as one of the five standards for foreign language education (ACTFL, 2006). The importance of culture is also recognized by the Partnership for 21<sup>st</sup> Century Skills; the Partnership identifies world languages as a core subject and encourages the use of 21<sup>st</sup> century themes as central to the core subjects (Partnership for 21<sup>st</sup> Century Skills, 2002). Therefore, teaching culture as a context for world language instruction is a deeper way to approach the theme of global awareness by broadening students' horizons to a world beyond what they know from their own culture.

## **Review of Literature**

Culture is an integral component in foreign language instruction (Shrum & Glisan, 2010; ACTFL, 2006; Curtain & Dahlberg, 2010; Castro, Sercu, & del Carmen Méndez Garcia, 2004). While language instruction once focused primarily on the linguistic aspects of a language without as much attention to culture (Richards & Rodgers, 2001), near the end of the 20<sup>th</sup> century the need for a more culture-based instructional approach was recognized. Foreign language instruction cannot be devoid of the culture associated with the language as the two are inextricably linked when helping students gain ability to communicate. Best practices call for a context-based approach to teaching (Malmkjaer & Williams, 1998; Breens, 1985; Brown, 1995), and culture provides an excellent context while helping meet the national standards for foreign language (ACTFL, 2006).

One of the 21<sup>st</sup> Century Themes, according to the Partnership for 21<sup>st</sup> Century Skills initiative, is global awareness (2002). In order to equip students for the digital age where other

cultures are only a click away, foreign language teachers must expose their students to the target culture and help them understand its significance within the world. As noted by the national foreign language standards (ACTFL, 2006), studying foreign languages is a way to empower learners to feel comfortable interacting with people of other cultures (p. 49). Not only does study of a language make intercultural interactions more comfortable, it can reduce or eliminate prejudices and destroy stereotypes (Ingram & O'Neill, 1999; Buttjes & Byram, 1990). Studying other cultures can broaden students' horizons by opening their minds to ideas with which they are unfamiliar and making them less abstract. This development of students' global awareness can help prepare them for life and a career in an international world, thereby helping to meet the goals set forth by the Partnership for 21<sup>st</sup> Century Skills (2002).

The national foreign language standards state that the study of culture includes the philosophical perspectives, the behavioral practices, and the tangible and intangible products of a society (ACTFL, 2006 p. 489). One practice shared by every culture is some form of dance. In particular, Hispanic cultures place importance on the language of dance. It is an expression of identity, both for individuals and for cultural groups.

Because dance as an art form is culturally relevant and important in Hispanic culture, dance can be integrated into the foreign language classroom as a cultural context for instruction. Berho and Defferding (2005) show that using art in the classroom exposes students to culture in a way that is relevant and interesting to them. In addition to cultural benefits, using the arts in other content areas can be beneficial for students who learn in different ways. Dance in particular accesses many of Gardner's Multiple Intelligences (Gardner, 2006). Greater use of the arts in the foreign language classroom can also provide an atmosphere of relaxation for students which is an ideal environment for language learning (Bancroft, 1994). Krashen's (1981) explanation of the affective filter, which has to do with one's level of anxiety, is important to consider when planning foreign language instruction. Willis (2007) proposes ways to lower the affective filter, namely a classroom environment that is free from intimidation. The incorporation of dance into the foreign language classroom can help lower the affective filter and thereby increase student learning.

The use of dance to support foreign language instruction and development of cultural awareness is a tool for contextualizing instruction in a relevant cultural practice. This action



research study examined the use of Hispanic dance in the high school Spanish classroom as a way to develop students' cultural awareness and language ability.

### **Methodology**

This study took place April 9-30, 2012. Subjects were 41 students of Level IV Spanish, in a public high school located in a central North Carolina school district. Subjects were selected based on their participation in Spanish classes taught by the researcher during the student teaching internship. This study was completed as part of an instructional unit designed by the researcher to incorporate Hispanic dance as a cultural context for language development. Data collection for this study occurred during normal instructional delivery as part of in-class assignments completed by all students. Students and parents/guardians signed assent and consent forms, which explained the study's design, purpose, and participation details.

There were three data collection methods involved in this study. The first data set involved student work samples from a series of assignments on the topic of Hispanic dance to support instructional strategies the researcher used to develop specific aspects of students' language and cultural awareness. The assignments led to a culminating project, in which the students researched an assigned dance, and presented it to the class in an oral presentation accompanied by Power Point or Prezi. The researcher used the assignments completed during the unit on Hispanic dance to evaluate the effectiveness of instructional strategies in helping students develop language and cultural awareness.

The second data set included the field notes taken by the researcher about the instructional process, which included classroom instruction and review of video-recorded instruction throughout the study. Following the video-recorded instruction, the researcher took field notes in a journal about the instructional strategies, student engagement, and development of students' language ability and cultural awareness. Students had the opportunity to refuse to be videotaped and still participate in the study.

The third data set included student responses to a written survey, which asked questions about their thoughts on the strategies used in instruction and perceptions regarding their development of cultural awareness and language ability in relation to the activities and final project.

The researcher analyzed the data collected from the three data sets. To protect the privacy of the subjects who participated in the research study, the researcher used a coded letter system

and assigned all 41 students a letter, A-OO. The researcher looked for recurring themes that provide information about how the instructional strategies using authentic Hispanic cultural dances influenced the students' development of language ability and cultural awareness.

## **Results**

In this study, the researcher analyzed the use of instructional strategies in the high school Spanish classroom using Hispanic dance as a cultural context for language learning. The researcher looked for major themes that emerged from the data collected during the study to answer the research question: how does the use of Hispanic dance in the high school Spanish classroom develop cultural awareness and language ability?

The results from this study showed that instructional strategies based on the topic of Hispanic dance helped develop students' cultural awareness. Students were able to make connections between the target culture and their own native culture. In addition, many students pointed out the historical significance of dance within the Hispanic culture. Multiple students were able to connect the cultural practice of dance with the perspectives of its society, demonstrating evidence of understanding cultural practices and perspectives, which supports the Cultures standards (ACTFL, 2006). Furthermore, student responses to the written survey indicated that 98% of students thought that the instructional unit on Hispanic dance helped to develop their cultural awareness.

Some students even recognized the importance of learning a language within the context of culture (Shrum & Glisan, 2010; Curtain & Dahlberg, 2010; Castro, Sercu and del Carmen Mendez Garcia, 2004). Not only did they acknowledge culture's place in language learning, but findings from this study reveal that instructional strategies using Hispanic dance as a cultural context helped students develop language ability. Students showed that they were able to use newly-acquired vocabulary and phrases, both in written and oral activities, including some idiomatic expressions. Responses to the written survey indicated that the majority of students felt the instructional unit on Hispanic dance helped to develop their language ability.

One of the overarching themes that emerged from the data was the connection between student interest level and student engagement. Responses to the written survey indicated that students enjoyed the activities in the instructional unit on Hispanic dance. The researcher noticed in review of the field notes a high level of student interest in the unit as a whole. Furthermore, in review of the field notes and video-recorded instruction, the researcher found

that the activities in which students showed the most initial interest were the same activities in which the students showed high levels of engagement. Students wrote in the written survey that the unit was a fun and creative method to explore another culture in an authentic way.

### **Conclusions**

Through the analysis of the three data sets, the teacher-researcher found ample data to support the idea that Hispanic dance can be an effective cultural context for language development and growth of cultural awareness. As Hanna (2008), Mason (2009), Minton (2000) and Robelen (2010) discovered, dance is an effective way to increase student learning. The findings of this action research study also support Ortuño's (2004) research regarding the role the arts play in improving students' L2 abilities. In addition, data gathered from this study support Richards and Rodgers' (2001) research about the effectiveness of instruction based on culture in teaching languages. The results of this action research study show that the instructional strategies used during the unit on Hispanic dance as a culturally authentic context for language learning are effective in helping students develop language ability and cultural awareness.

Findings from this study suggest that students were developing linguistic competence through experiences provided that combined language and culture (ACTFL, 2006). The teacher-researcher determined that many students recognized significant practices and perspectives from the target culture as a result of the instruction used, and most were able to draw parallels between the target culture and their own native culture. Continuing to incorporate the culture of Hispanic dance in Spanish-language instruction can increase students' awareness of the target culture as well as their understanding of their own native culture.

This study provided insight into the positive correlation between student interest and engagement and the development of students' language ability and cultural awareness. Student responses to the written survey indicated that they enjoyed the instructional unit as a whole. Through analysis of the three data sets, the researcher was able to see that students performed better on the activities in which they were most interested. As a beginning teacher, the researcher will strive to meet this level of engagement by continuing to plan using instructional strategies and activities that are interesting and relevant to the students.

Little research has been conducted on the use of the arts in the foreign language classroom, and the teacher-researcher did not encounter research on the use of instructional strategies incorporating dance into the foreign language classroom. Therefore, further research

should be conducted to affirm the validity of such methods. The teacher-researcher will continue to plan instruction incorporating the arts in a culturally relevant way into her classroom. Additionally, this study showed the teacher-researcher the importance of conducting action research with her students as a way to continue to develop instructional strategies and reflect on best practices.

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## What's My Role? Using Roles in Cooperative Learning in Social Studies

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June 2012

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The Partnership for 21<sup>st</sup> Century Skills formed in 2002 to promote “21<sup>st</sup> century skills” in education. Their 21<sup>st</sup> Century Skills Framework provides direction for preparing students to be participants in our society. The framework (2011) suggests that students should “communicate effectively in diverse environments” (online). Furthermore, students should work within diverse groups and “assume shared responsibility for collaborative work, and value the individual contributions made by each team member” (online).

The National Council for the Social Studies (NCSS) presents similar goals for educators. In order to prepare students to become effective citizens, NCSS (2010) posits that teachers should help them to develop skills such as decision-making and problem-solving as well as allowing them to collaborate with a group (online).

Clearly, both the 21<sup>st</sup> century skills and NCSS strongly encourage cooperative learning. Johnson and Johnson (1999) define a cooperative learning group as one in which “Students work together to accomplish shared goals...Individual performance is checked regularly to ensure that all students are contributing and learning” (p. 68).

### **Literature Review**

Overall, cooperative learning has been associated with high achievement and higher level thinking (Johnson & Johnson, 1990 ; Slavin, 1980). Cohen (1986) stresses the importance of group work in building problem solving skills, improving social skills, and keeping students engaged. Hassanien (2007), who examined student perceptions of group work, found that students have a preference for group tasks and enjoy the opportunities that collaborative projects afford them to interact with diverse students.

Unfortunately, research suggests that teachers tend to rely on more traditional methods. Goodlad (1984) studied teaching practices in schools and found that, even after the introduction of “progressive” ideas, teachers continued to follow traditional methods. Classroom setups reflected teacher centered instruction and the teacher remained the central figure in the learning

process. Bolinger and Wilson (2007) attest that secondary social studies teachers consider lecture, discussion, and projects to be more effective than cooperative learning.

Several studies suggest possible causes of this disconnect. Researchers have reported several concerns and frustrations regarding group work that have been expressed by students and teachers alike. Students and teachers report problems with time management, distribution of workload, and personality conflicts, and the preparation needed for group work (Galton, Hargreaves, & Pell, 2009; Hassanien, 2007; Morris & Hayes, 1997).

Johnson and Johnson (1999) argue that not all groups are cooperative. They stress the importance of teacher preparation in going beyond simple group work to design effective cooperative learning. Gillies and Boyle (2010) noted that teachers recognized the need to teach social skills necessary for group work. Hassanien (2007) reported that students involved in group work studies suggested that “When tackling group assignments, consideration should be taken towards group dynamics, planning and organization, conflict resolution, time management and so on” (p. 144).

A common thread that runs through the literature regarding cooperative learning is the significance of creating accountability for students’ contributions to groups (Johnson & Johnson, 1990; Slavin, 1995). Researchers agree that assigning individual students a role within the group is a way to accomplish this goal. Cohen (1986) defines a role as a job that is given a name and is accompanied by a list of expected behaviors. The role of the teacher...is to create directions for tasks and rules, assign groups, train students in “cooperative norms,” and hold groups accountable (p. 91).

This study examined the question of what effect teacher-assigned roles in groups have on student engagement and perception of group work in an honors-level United States History course.

### **Methodology**

A study of one honors-level United States History class at a suburban public high school in North Carolina was conducted in an effort to answer the research question. The study consisted of three main components: a pre-study survey, six group work assignments with student evaluations, and a post-study survey.

At the beginning of the semester, participants completed a brief survey that included questions related to the students’ past experiences with cooperative learning such as whether

they prefer group assignments over other types of instruction, how focused and productive they usually feel when working in groups, and how they perceive the fairness of group work (particularly regarding the work distribution).

After the class completed the survey, participants completed five group assignments as a part of the study. At the beginning of each group work assignment students were assigned roles to fulfill as a part of the assignment. After every group assignment, all students were asked to complete an evaluation of themselves and their peers. In addition, students were asked to discuss whether or not they felt focused during the activity, if they thought the assignment helped them to understand the material better, and whether or not they would have rather covered the material in another way. The open-ended survey questions and the evaluations were analyzed using the method of grounded theory which “allow[ed] the theory to emerge from the data” (Strauss & Corbin, 1998, p. 12). While the students completed group work assignments the researcher acted as a participant observer and collected data using Spradley’s (1980) Descriptive Question Matrix.

The study ended with another survey. The second survey was similar to the first, but included questions that were intended to allow students to incorporate their new experiences with working with assigned roles.

## **Results**

### *Pre-Survey*

The purpose of the first survey was to gather information about the students’ preferences for learning, initial perceptions of group work, and previous experiences working in groups. Only slightly over half of the 17 participants enjoyed group work more than both independent work and lectures at the beginning of the study. Less than one-quarter of the participants showed a preference for group work over class discussion. In response to a Likert Scale, students most frequently were either unsure about their level of focus during group work, or indicated a positive perception of their focus and engagement in cooperative learning activities. While nearly half of the students had a positive perception of their ability to learn when working in groups, almost as many students indicated that independent work or lecture would benefit them more academically. Over half of the students who participated in the pre-survey indicated that they felt like they usually did more work than other group members in cooperative learning activities.

In response to an open-ended question regarding the difficulties associated with working in groups, the students' responses fell into three general categories: students failing to contribute to the group, problems associated with staying on task, and conflicts between students. When students were asked to make suggestions for the improvement of group work, a common theme was that the teacher needed to intervene in order to hold students accountable.

#### *Evaluations*

After each group assignment students were asked to complete an evaluation. One of the common themes that emerged from the evaluations was that students with a certain role (mainly the writer of the group) ended up doing more work. Despite this, few students reported frustrations associated with working with their peers and most students reported feeling focused and enjoying the activities.

#### *Observations*

My observations confirmed that students who were assigned to write for their groups often took on a large portion of the work (writing, coming up with ideas, and directing their peers). Some students seemed to think that if they were assigned to keep time or facilitate the group, they did not need to contribute any of their own ideas. I also noticed that various other factors affected the usefulness of the roles. These included how the roles were assigned, the composition of groups, and the type of assignment. In general, I agreed with the students' sentiment that they needed a great deal of guidance from the teacher to cooperate effectively.

#### *Post-Surveys*

The final survey revealed that the participants' learning preferences had changed only slightly. Several students indicated that the roles had been helpful for their groups because all students had a specific task. On the other hand, multiple students also said that the roles were ineffective because their classmates did not actually fulfill them. When asked to discuss whether or not they would try to use roles in the future, many students doubted whether or not they would be able to implement such a system without guidance from a teacher, and seemed to prefer to let roles come about naturally.

### **Discussion/Conclusions**

This study demonstrated that although teacher assigned roles may have created some positive change in the participants' perceptions of group work and their engagement in group activities, there are other factors that affect cooperative learning.



The pre- and post- surveys demonstrated little change in the student's perception of group work. The post-surveys did indicate that students felt more confident in their ability to focus in groups. Students were not as positive about their ability to learn while working in groups. Similarly, the students' responses demonstrated ambiguous changes in their perceptions of the distribution of work within in groups. Even though students felt less strongly that they were doing most of their work, they still felt that work was not distributed equally. Despite their negative responses regarding work distribution, the fact that students were less certain that they had to take on most of the work could suggest that students felt less frustrated when working in groups with roles.

The participants' responses to the surveys support the findings of other studies. Students expressed many of the same frustrations including problems with distribution of workload and peer conflicts (Hassanien, 2007; Morris & Hayes, 1997). On the other hand, some of the students' answers to open-ended questions and their responses to the group work evaluations corroborate other studies related to the positive elements of collaboration. Several of the students reported that giving everyone a specific task made group work much more effective (Cohen, 1986; Slavin, 1986).

A theme that emerged from the students' pre- and post- surveys, as well as my observations, was that students required a great deal of teacher intervention to function well in groups, even with the roles. Multiple studies indicated that students needed training for cooperative learning. According to researchers, teachers needed to make "preinstructional decisions," to teach the social skills necessary for group work, and to manage and assess groups (Johnson & Johnson, 1999, p. 69; Gillies & Boyle, 2010; Hassanien, 2007; Chapman et al., 2009). Throughout my observations I noticed that factors including group size, how students were assigned to groups, and the way in which roles were assigned all had an impact on the success of student groups.

This study provided valuable information, but had limitations. The largest limitation was that it included only a portion of one honors class. Furthermore, due to the nature of action research, my observations were not always as thorough and focused as I would have liked.

Despite this study's limitations, I will be able to use the results to inform my practice. The study highlighted the positive aspects of cooperative learning and revealed ways in which I could make my use of group work more effective. I will work to establish a classroom culture in

which students consistently develop intrapersonal skills that will help them to be more successful when working with their peers. Additionally, I will carefully monitor each class to assess how I should group students and to what degree it is necessary for me to intervene in student groups. Just as is true with every other element of education, group work has proven to be beyond the constraints of any sort of formula or prescription, but this study outlines the ways in which I may begin to craft successful cooperative learning in the future.

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## “And Historical Thinking For All”

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June 2012

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Our country’s No Child Left Behind legislation emphasized English and math skills, often at the expense of social studies curriculum (Pederson, 2007). Wineburg and Martin (2004) argue that students lack the ability to discern what information is quality in this information age, and the place to teach them how to decide “is the history and social studies classroom” (p. 42). They also contend that history has become an ideological and political curriculum intended to create “intoning loyalty oaths” (p. 45). The implicit suggestion is that current curriculum in America presents students with absolute truths, rather than create the ability to read and analyze text. Students in social studies classrooms are given the opportunity to develop important skills such as the ability to read, analyze, and decide on issues for themselves. These skills are the basic skills that citizens use in the political arena when participating in a democracy. As a content area, the social studies provide this unique opportunity to create literate, informed citizens.

Classroom activities implemented by teachers that impart skills, rather than knowledge, to students are important. The use of primary sources is vital to social studies instruction, according to many studies (Dutt-Doner, Cook-Cottone, & Allen, 2007; Kang, 1994; Waring & Robinson, 2010). Primary sources are used as an example of how history is an interwoven story of many biases, perspectives, and authors. They provide an alternative to the textbook, which can often turn history into a single story of facts.

Reisman and Wineburg (2008) suggest activities that can help students improve historical thinking about context. Contextualized historical thinking “is impossible to accomplish without background knowledge” (Reisman & Wineburg, 2008, p. 203). Thus, one of the responsibilities of the teacher is to provide crucial background knowledge. Without at least a basic timeline of relevant events, students are unable to place texts in any context whatsoever. Teachers should also provide guided questions with reading, which differ from recall questions. These questions should prompt careful and deep thinking about authorship, bias, perspective, context, and word

choice. Students are used to reading text and being asked to recall facts. Teachers should develop guided questions that are higher on Bloom's taxonomy. Lastly, this article suggests the same method of modeling think-alouds that Wineburg suggested in other articles. These activities, with the exception of providing necessary background information, have students thinking for themselves and forming their own conclusions.

One problem with using primary sources is that they are difficult for students to read. Wineburg and Martin wrote in a 2009 article that "written in language that differs radically from our own, original documents pose challenges that daunt our best readers – let alone those reading below grade level" (p. 212). Due to this concern, many teachers leave primary documents out of their history classroom entirely. However, Wineburg and Martin (2009) suggest that teachers are making their decision based on a false dichotomy – "too often the decision to use a particular source is cast in the brittle terms of 'yes' or 'no'" (p. 212). Their suggestion is that teachers adapt primary sources to their students. Using this strategy, primary sources can be read by students on many achievement levels.

Historical thinking, fostered in social studies classrooms by using primary sources, should be taught to all students. Standard level students need these skills just as much as higher level students in order to become informed and capable citizens. This study seeks to incorporate the activities and methods of teaching historical thinking to students, in particular the strategy of adapting primary sources to lower reading levels. If students are provided with effective and purposeful instruction on historical thinking, will standard level students exhibit these skills?

### **Methodology**

To address this research question, the researcher designed a quasi-experimental study which took place in three social studies classes, all taught by the researcher. The classes were all different levels: one honors, one standard, and one Sheltered Instruction Observation Protocol (SIOP). The research required all students to complete four primary source exercises to demonstrate their ability to think historically. Three of these exercises will consist of two primary documents, which are contemporaries, written by different authors from different perspectives. The third of the four exercises consisted of three contemporary primary sources. The teacher gave a brief background on the time period and the author of each document, and provided biographical information without any of their explicit biases. Students then responded to questions similar to the following on each exercise:

1. What is the name of each source?
2. Who is the author of each source?
3. What is the date for each source? Are these sources from the same time period?
4. What is the author's bias?
5. Who is the audience for each source?
6. What does each source say?
7. Why is each source saying what it does?
8. Do the statements in these sources agree?
9. How reliable are these sources?
10. What do these sources tell you about the time period?

The first few questions tested the students for simple comprehension. Responses to questions 4-8 require a lower degree of historical thinking, while question 9 and 10 require a high degree of historical thinking. Students' historical thinking was judged through thorough analyses of their writing. This analysis took place primarily through two qualitative methods: grounded theory and quasi-statistics.

Grounded theory involved coding the students' responses. After reading through each response multiple times, portions of their writing were sorted into categories. These categories included identifying bias, identifying purpose, evaluating reliability, document synthesis, and overall importance. Student samples were cited to display in a qualitative manner the degree of historical thinking that was exhibited.

A quasi-statistical element was added to the research as well, by quantifying their thinking on three levels: inadequate, adequate, and outstanding. Inadequate historical thinking included students who did not comprehend the subject matter, exhibited only basic comprehension, or trace amounts of historical thinking. A trace amount of historical thinking was usually a bevy of incorrect answers, combined with one or two relatively profound historical insights. Adequate historical thinking included consistently correct insights, with several profound comments on bias, purpose, or reliability of the primary sources. Outstanding historical thinking included almost exclusively correct historical insights, with one of the following: a brilliant insight into bias, purpose, or reliability, a quality synthesis of two sources, or a quality evaluation of a source's insight into the historical period.

The first primary source exercise took place about one month into the semester. Each subsequent exercise took place after one and a half weeks had passed, for a total over four exercises in a six week period. Using the coding and quasi-statistical data, the students' ability to think historically was assessed. Growth was also determined by comparing data from the first

exercise to the final exercise by the same criteria. This data analysis informed the researcher as to whether or not students were competent in historical thinking, as well as if improvement occurred.

## Results

The results are reported by class. The honors class had 28 students, the standard class had 23 students, and the Sheltered Instruction Observation Protocol (SIOP) class had 21 students. The classes often did not have perfect attendance, so percentages are taken considering the amount of students present. If a student did not submit their work for the day, however, it is still factored into the class's percentage. All percentages are rounded to the nearest tenth. Each section will include a quantitative and qualitative component. The names of all students will be represented with pseudonyms to maintain anonymity.

## Honors

	Exercise 1	Exercise 2	Exercise 3	Exercise 4
Inadequate	12	10	9	17
Adequate	12	12	10	8
Outstanding	1	2	2	2
<i>Students present</i>	<i>27</i>	<i>25</i>	<i>27</i>	<i>27</i>
% of students: adequate or outstanding	48.1%	56%	44.4%	37.0%

The honors section had the highest percentage of students exhibit adequate or outstanding historical thinking on every primary source exercise. Scores were highest on the Description of the World and the Tale of the Destruction of Riazan. The numbers suggest that approximately half of the class did not exhibit any significant historical thinking, while the other half of the class did an adequate job thinking historically. Every now and then, one or two students had a particularly insightful comment on the primary sources. These were an aberration, however, and not a trend in the class.

## Standard

	Exercise 1	Exercise 2	Exercise 3	Exercise 4
Inadequate	13	14	15	13
Adequate	1	5	5	6
Outstanding	0	2	0	0
<i>Students present</i>	<i>23</i>	<i>21</i>	<i>22</i>	<i>21</i>
% of students: adequate or outstanding	4.3%	33.3%	22.7%	28.6%

The standard class had an evident jump from the first exercise to later exercises. Only one student displayed any significant historical thinking on the first set of primary sources. After this exercise, about 1 out of every 4 students exhibited adequate historical thinking. While this is a clear improvement, it still means 3 out of 4 students did not grasp the exercise. Combined with the low amount of outstanding insights, this class's quantitative results do little to prove students are capable of historical thinking.

### **SIOP**

	Exercise 1	Exercise 2	Exercise 3	Exercise 4
Inadequate	5	15	13	12
Adequate	5	4	6	3
Outstanding	1	1	0	2
<i>Students present</i>	<i>20</i>	<i>21</i>	<i>20</i>	<i>21</i>
% of students: adequate or outstanding	30%	23.8%	30%	23.8%

The SIOP class fared better on many of these exercises than the standard class. Their percentages were relatively similar, but they did not score as dismally on the first primary source exercise. While more students showed adequate or outstanding historical thinking on this first set of sources, a significant portion of the class did not submit their work. In fact, almost half of the class did not turn in any answers at all. This improved over the course of the semester, however. While the percentage of students exhibiting adequate or outstanding historical thinking did not grow, the number of students who submitted their work did.

## Discussion

Even with all of this information documented, the research question remains unanswered. The level of historical thinking ninth grade students will exhibit can range from outstanding to completely absent. The thinking varied based on the student. Many of the students who displayed outstanding critical thinking in the Honors and SIOP classes changed, however. For example, Genesis and Yazmin showed outstanding historical thinking on only one exercise each. This demonstrates that several students, not just one or two, were able to exhibit high quality historical thinking.

Many students struggled with these exercises though. With the exception of Honors' third exercise, every set of data had double digits of inadequate historical thinking. With at least 50% of students not understanding the content of the sources, justification for the activity becomes more difficult to provide. Students should not be given up on though. There is potential in this endeavor. It was showed by students' apt analyses of bias and purpose, as well as their syntheses and evaluation of importance for multiple sources. This study was limited by a small sample size and a lack of high quality instruction. Even with these limitations, some students were capable of historical thinking. Moving forward, teachers should continue to attempt the extraction of historical thinking from students. Those who might be considered too young, such as ninth graders, or too far behind, such as standard and SIOP students, are capable of proving themselves.

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## Grading Teacher Feedback: An Action Research Study

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June 2012

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Teacher feedback written on student drafts is a major mode of writing instruction (Applebee, Lehr and Auten, 1981). However, its effectiveness is not always felt by teachers; English teachers often complain that grading papers is the most time-consuming portion of their job, but not always the most beneficial (Potts, 2012; Sommers, 1982; Stern and Solomon, 2006). So why do teachers believe written feedback is important? Do students perceive feedback as equally important? What kinds of comments do teachers write, and which kinds do students find most helpful? Research in pursuit of these questions implies that teachers offer a variety of comments on student papers, the most common of which are short and mechanics-focused, and that students appreciate comments that are constructive, positive-sounding, and that maintain the student's authority over the piece. The current study seeks to uncover the attitudes of high school students in a mid-sized public high school toward teacher feedback on drafts of their papers, to compare their responses with established research, and to inform the researcher's own practice in her future classrooms.

Theorists explain that the teacher is not the corrector and preserver of standardized English, but more like a midwife supporting another's creative process. Sommers (1982) asserts that students should be trained to write well, with their own voice and creativity, not simply taught to complete an assignment to their instructor's parameters. Wilson (2010) proposes that the point of writing instruction is to make students become writers—people with power over their own pieces. To this end, the purpose of written feedback is “to dramatize the presence of the reader,” (Sommers, 1982, p.148). While giving a grade seeks to assess and label a piece, and potentially assigns the writer an identity, giving specific and constructive feedback theoretically aims to help a writer improve (Elbow, 1997).

Sommers's 1982 study established some important findings concerning the ways teachers write comments and the ways students respond to those comments. She found that teachers often give vague, generic, and contradictory comments. Other studies have similar findings.

Teachers mark problems rather than imagining new additions to the piece, and often correct simplistic errors like grammar and spelling mistakes rather than commenting on rhetorical features of the paper (Connors and Lunsford, 1993). Teachers should avoid a focus on technical errors, and instead should selectively mark repeating errors in the composition and include positives with corrections (Stern and Solomon, 2006). In general, theorists claim teachers should aim to more than simply help a student fulfill the parameters of an assignment: they should help students to be writers.

Since identifying the effectiveness of teacher feedback is complicated (what makes a piece of writing better than another?), many studies on teacher feedback focus on students' attitudes or perceptions of different kinds of comments. Straub (1997) articulated many of the features of feedback that students appreciate: comments should be positive, helpful toward future revision, and couched in a gentle tone of non-hostility; he concludes that teachers should view giving feedback as a give-and-take dialogue. Teachers should explain why something is good or bad, and they should be positive and not sarcastic when marking student papers (Lynch and Klemmons, 1978). Overall, three main themes emerge in the research: students want specific comments, students want positive comments, and students want clear, usable comments that can be applied to later drafts.

## **Methodology**

This study took place in a mid-sized public high school in North Carolina in two English II classes I taught as a student teacher. Each class contained about 30 students. All students completed a multi-genre project on a subject of their choice that included a 3-5 page research paper and a presentation. Students wrote two drafts of the paper that I assessed for the study.

Students' initial attitudes toward teacher feedback were assessed using a questionnaire I developed that sought to reveal students' opinions concerning 1) the purpose of teacher feedback 2) if they think feedback in general is helpful, and 3) what kinds of feedback they find most helpful. Next, I measured both my own patterns in feedback-writing and student reactions to different kinds of feedback using a feedback sheet I developed. After students completed the first and second drafts of their research papers, I graded them, and offered feedback on a separate form. For each comment I wrote, I numbered it, and wrote a corresponding number on the student paper at the place where I normally would write a comment in the margin. I then asked students during class time to respond by telling me if my comment was helpful, if they

understood it, and if it would affect their later writing. I later coded my comments by using two sets of categories, one related to form (how it was written) and one related to content (what I was writing about). My third source of data consisted of my own log as the instructor of the classes.

### Results and Discussion

While I acquired quantitative data in the study from my questionnaire and the feedback sheets the majority of it was inconclusive. The most illuminating set of quantitative data I received was the patterns of kinds of comments I wrote on student papers. I discovered I left a range of different comments, the least common of which was rewriting my students' sentences, the most common of which was issuing a command to change an aspect of their paper. I also discovered that I left a large number of combination comments—comments that included several forms, that perhaps started off with praise, transitioned with an observation, and ended with a question.

**Table 6**

<i>Draft 1 Feedback</i>			
FORM		CONTENT	
Praise	115	Word Choice	188
Command	145	Grammar	18
Question	118	personal reaction	19
Suggestion	135	Global, rhetorical, content	115
Observation Statement	134	Organization	91
Rewrites sentence	51	MLA	40
<i>Total Comments</i>	<i>505</i>		
<i>Combination Comments</i>	<i>166</i>		

My qualitative data gave me better insight into my students' responses to my feedback. One pattern I saw in the kind of feedback I made on student papers was my proliferation of questions. I think I was fond of posing questions to students because I subconsciously felt it lessened the harshness of whatever I was suggesting they do. However, judging by my students' responses, they were not always able to grasp the intention behind my questions. The student interaction below shows a student who clearly understood the motive behind my question:

Me: "Maybe explain this more. When did he die? How many years later did Anne die?"

Student: "Ok! I will research more!" (feed1.23.9)

For other students, my use of questions generally had one of two results. First, my students liked to simply answer my questions on the feedback sheet:

Me: "Who are 'they'?"

Student: "The crusaders" (feed1.21.1)

Second, occasionally my use of a question made my meaning opaque. I had a tendency to turn commands or suggestions into questions in order to soften my comment (e.g. “Take out this word” would become “Should you take out this word?”). While it may have made the tone less harsh, it also clouded the meaning.

Next, my students craved clarity in my comments. Confusion usually arose when I made assumptions about my students’ prior knowledge: I would use terms or phrases like *comma splice* or *passive voice* that they did not understand and therefore could not apply. For students, knowing exactly what my advice meant was the first step in applying it to their writing. I had one student who during tutorials rewrote my feedback along the margins of her paper: “Vanessa found it useful to write down my advice in her own words on the paper” (notes.2.2).

Another common thread I saw in my students’ reactions to my feedback was that they appreciated praise. My praise—no matter how simple—was usually met with an enthusiastic “Thank you!” from students. During my one-on-one conferences with students after school, I found it was helpful to start off with a compliment: “They seem more at ease afterward.” (notes.2.18). Here a student explains why he found my praise helpful on his second draft:

Me: “Overall, your first draft was quite good and didn’t need a lot of changes. I think draft 2 did a nice job of improving on it.”

Student: “Helpful/Thanks/I think This will actually improve my writing because I know what I did right.” (feed2.54.4)

Finally, my students, as I expected they would from the research, showed a strong desire for me to give them solidly specific feedback that told them precisely what to change in their paper. They appreciated when I told them exactly what to do.

Me: “New P. Possibly rephrase this “By the time Keller was 6...”

Student: “Ok! I understand!” feed1.23.4

This also meant, unfortunately, that students generally liked it when I rewrote their sentences for them. Because I was philosophically opposed to that practice, I avoided it and on draft 1; a mere 7% of my comments rewrote phrases for students. Often I would tell them to “rephrase” or “clarify” something, and they often responded to these foggy statements with confusion:

Me: “rephrase this sentence”

Student: “I don’t know any other way to” (feed1.46.11)

Unfortunately, I think I wrote words like “rephrase” not only to keep the writing in the student’s hands by refusing to feed them words, but because it was easier for me. Writing “rephrase” does not require me to determine the exact issue; I only need to quickly see that there is an issue, and then point it out to the students. While some students were capable of fixing syntax weaknesses on their own, many of my students needed additional scaffolding.

I also made findings on topics tangentially related to my research questions. I noticed throughout the course of my study that giving feedback was like having a conversation with my students. My students were often affected by more than just the form and content of my comments, but also by their relationship with me the reviewer. Some of my students made it very clear that they saw me as an authority figure, an expert who held the keys to good writing and whose advice must be followed for the sake of “correctness” or a higher grade. These students would react submissively to my advice, sometimes even apologize for their writing and assure me that they would “fix” it. Other students saw me as a peer with whom they could agree or disagree:

Me: I wonder if you should give a little more info. here about who Orr and Gretzky are?

Student: “I agree, I think I should add more info about Orr and Gretzky where I have already mentioned them.” (feed1.26.5)

Other students would defend their choices in their paper:

me: “solid intro. ‘a man with a dream’ might be confusing”

student: “but James Naismith was a great inventor. but I understand” (feed1.43.2)

Other outside factors affected students’ reactions to my feedback. I noticed that students who received a lower grade on the assignment, or who were more concerned with points often reacted with more hostility to my feedback. Additionally, students who wrote on topics I did not agree with acted very hostile toward me as a reviewer:

“hmm—your tone seems pretty opinionated here. In a research paper, you want to keep your opinion neutral”

“Disagree. I’m writing the paper.” (feed1.7.10)

I also found that the feedback forms were well-received by students as an instructional tool, even though they were a weak data collection instrument. Hardly any of my students gave me specific feedback about my feedback—in which they were able to assess and criticize my comments. Most of my students only looked at the feedback as a message to them about their

writing, and they responded to it as such: answering my questions, saying thank you, or telling how they would use the comment. However, even though my students did not evaluate my feedback, they did happily inform me that they liked the structure of feedback sheets. One student wrote at the bottom of her 2<sup>nd</sup> draft: “I really like these feedback sheets! They help a lot!” (feed2.3.7). However, the feedback sheets worked better for some students than others and I also found that it was important, especially with struggling writers, to have one-one-one verbal conversations with them about their writing.

### **Conclusion**

I began this study with the assumption that students know a bit about good instruction, and that their evaluation would be helpful to me because they are capable of telling me about how they best learn. Even though my data collection did not focus on the effect of teacher feedback I hoped to get a good sense of it by looking at student opinion. At the conclusion of this study, I find myself unconvinced that students are good measurers of their own learning. My students for the most part were unable to distance themselves sufficiently from my feedback to evaluate it. And my students’ opinions usually circled around what would make revision easiest for them, instead of what would challenge them in growing as young writers. As a writing teacher, I must convince my students that they are writers with full control over their pieces, and have the right to agree or disagree with the reviewer.

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# How Graphic Organizers Affect Student Achievement and Engagement in Poetry Analysis

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June 2012

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Many academics, teachers, and researchers find great promise in the educational benefits of poetry. Seen as an abstruse and frustrating enigma accessible to only intellectual or academic elites, students frequently become discouraged by traditional ways of engaging with poetry (Denman, 1988; Scholes, 2001). If traditional, teacher-centered methods have produced this reluctance to embrace poetry and reap its intellectual and emotional benefits, we must look beyond these approaches to integrate new methods into the curriculum to repackage the ways students analyze poems (Benton, 1999). As we attempt to facilitate the resurrection of poetry in high school students' lives, we can see the imperative for developing effective instruction. Poetry offers students an introspective lens, provides an opportunity to develop critical thinking skills, and serves as a crucial artifact from our shared cultural heritage. While teachers continue to develop effective teaching methods to facilitate students' interpretations and understandings of poetry, this study seeks to offer one potential solution – graphic organizers. By including these instructional tools in this action research study, it is the author's hope to bridge these pedagogical gaps and bring poetry back where it belongs – in the hands of students.

## **Literature Review**

An overwhelming amount of educational and psychological research suggests that the study of poetry in all levels of high school students produces profoundly positive effects on abstract reasoning, writing abilities, and appreciation of literature (Richards & Ker, 2001; Stange & Wyant, 2008). However, these benefits of poetry have been largely untapped in American schools (Denman, 1988; Scholes, 2001). Current pedagogical methods of teaching poetry employ a reliance on teacher dissemination of interpretation and meaning. In addition, these ineffective practices tend to neglect visual organizational schemas that reach a wider range of learners, favoring a one-dimensional approach which involves students taking free-form notes as to the “correct answers” of meaning within a poem. These approaches lead to student disinterest and fail to properly instill the necessary critical skills to interpret poems (Scholes, 2001; Peskin, 2011). While the current paradigm of poetic instruction may be disheartening, scholars suggest

the potential for including a new pedagogical instrument in the teacher's repertoire – graphic organizers. Graphic organizers have been loosely defined as visual-spatial displays that require active student-arrangement of information in logical and pictorial way that lends itself effectively to bolstered information retention and increased organizational outcomes (Darch et. al., 1986). These tools have been proven to increase writing coherency, abstract reasoning, and textual comprehension (Denner, 1986; Fergus, 2009). Despite the application to other content areas and modes of literature (Ives & Hoy, 2003, Liu et. al., 2011), little to no research has been published on the correlation between graphic organizers and student analysis and engagement in poetry.

### **Methodology**

This study was conducted within the definitions and expectations of a standard action research study. This action research is loosely based on Lewin's "continuous spiral" framework that seeks to integrate the subject into the course of the study, eroding the traditional separation of objective distancing engendered in more traditional models of research. The approach taken in this study closely resembles Lewin's "spiral" model, seeking to employ a variety of graphic organizers in order to bolster student achievement in the study of poetry. The precise definition for these tools has been developed from the work of Darch, Carnine, and Kameenui (1986).

As with most action research studies in the field of education, the primary research site was in the classroom. Taking place at West Forsyth High School, a large heterogeneous public school in the Winston-Salem/Forsyth County School District (North Carolina), research participants were students enrolled in classes in which I served as the student teacher. Participation was open to all students in my three Advanced Placement English Language and Composition sections (11<sup>th</sup> grade) who return a signed assent and parental consent form acknowledging their desire to be included in the study.

Before the study was initiated, the control and variable groups were selected based on the pre-determined class assignments for the roughly equivalent classes. A formal pre-test of an out-of-class essay was administered in order to gauge the level of student ability in analyzing poetry and serve as the baseline for student achievement before administration of the study. Students submitted their work for review after six days. A whole-class discussion about poems took place at the end of the six days and was filmed in order to assist with data collection.

In both the control and variable group lessons administered after the pre-test, I taught mid-length (approximately 12-40 lines) poems of approximately 12-40 lines that employ a



variety of simple and complex literary devices. These types of poems offer enough textual basis for a standard AP-length 5 paragraph essay. I asked students to identify various elements of the poem in order to unravel its meaning and synthesize them into complex thoughts about the poem. While the variables group employed teacher-disseminated graphic organizers, both groups participated in whole-class discussions about the texts. These activities sought to construct knowledge through student-centered means rather than the instructors lecturing the meanings behind poems. Specifically, students read and comparatively analyzed John Keats's "When I Have Fears" with Henry Wadsworth Longfellow's "Mezzo Cammin" for the pre-test, and William Blake's "Chimney Sweeper" poem from 1789 with the 1794 version for the post-test to reach an "understanding" of the various literary devices and author intentions behind the work. Selected poems reflected class achievement level and consistent national scores. Students were instructed to spend no more than 60 minutes reading each prompt and composing each essay. This reflects a comparable experience of taking the AP exam.

At this point in the duration of the study, I implemented graphic organizers in the lessons for the variable group, classes A and B. Class C composed an essay without any additional graphic organizers to serve as the control group. Prior to distributing these teacher-generated learning tools, I instructed students in the proper method of completing organizers and using them in written and oral work. In the lessons I taught during this study, these connections between abstract concepts will be stressed as well as organization of writing. In addition, the students' abilities and proclivities to provide textual justification for ideas were considered a major educational outcome to be analyzed. This means the provision of evidence, explication of meaning, and synthesis with other parts of the poem used in academic writing. Informing these assessment decisions, Carney (1983) outlines the nuances of interpretation and these skills that are crucial to a proper academic discussion of a poem.

During the course of the regular instructional period in the variable group, two different graphic organizers were employed based on the educational goals and type of assignment. Class A was given a TPCASTT graphic organizer while Class B was given a Venn Diagram handout to complete prior to writing the essay. The TPCASTT organizer is designed to help students approach a poem by completing successive boxes of "Title," "Paraphrase," "Connotation," "Attitude," "Shift," "Title revisited," and "Theme." This organizer should theoretically show the progression from concrete aspects of the poem to the more abstract conclusions gleaned from

careful readings. The Venn Diagram, consisting of two concentric circles representing each poem with an area of intersection for similarities, should assist students in processing and organizing the similarities and differences in two poems. Class C was designated as the control group and received no additional instructional tools.

. The formal post-test (another essay with the same parameters) represents the summative knowledge and skills in poetic analysis gleaned from the course of the lesson. In the concluding days of the instructional intervention, the same procedures for evaluating pre-study competency and achievement were employed, isolating variables by paying close attention to the factors that the graphic organizers are attempting to address – namely, the ability to effectively identify, organize, and see the connection between complex elements of a poem. After analysis, these results were compared across the variable and control groups as well as between the pre-test and post-test to measure differences.

To collect the data of this study, I carefully studied in-class discussions of both groups that I facilitate and take field notes of the entire class discussion in order to identify trends and particular responses that represent patterns of behavior and thought. In addition, classes were video and audio recorded in order to preserve student statements and overall class tendencies for retrospective review. Individual interviews investigating student comprehension of the poems were completed using similar questions asked during the course of the class, yet without the anxiety of providing an incorrect response in front of peers. After the study, students in the variable groups completed a survey that probed students' self-evaluation of the work. Survey questions sought to determine a connection in students' own perceptions of the effectiveness of the graphic organizers and the demonstrable effect on the quality of student work. This multifaceted triangulation of data analysis maximized data reliability. After the synthesis of all data collected, conclusions were drawn that not only evaluate the effectiveness of graphic organizers on student interpretations and engagement in poetic texts, but also determine which specific formats are more desirable for specific kinds of texts and assignments.

### **Results and Discussion**

From a quantitative perspective, it is clear that the variable groups who employed the graphic organizers demonstrated a statistically significant increase from the pre-test to the post-test. Graded on the A.P. scale 0-9 where 8 represents "effective," 6 represents "adequate," 4 represents "inadequate," and 2 represents "little success," these essays were submitted by nearly

half of each class, totaling over 50 analyses total. This would serve as a sufficient sample size to see what, if any, effect the graphic organizers had. For all the essays, I graded the student work based on the general rubric for A.P. Literature and Composition Poetry Open Response. In Class A, the pretest score average was 3.967 with a standard deviation of 1.507. After using the TPCASTT graphic organizer, students showed a remarkable improvement, averaging 5.05 with a standard deviation of 1.280. In Class B (n=17), the pretest score average was 4.214 with a standard deviation of 1.1883. After using the Venn Diagram, the average essay grade also increased by approximately one point to 5.05 with a standard deviation of .845. All comparisons from the initial essays to the final summative assessments fell outside the standard level of statistical error (5%), suggesting that both graphic organizers did indeed have a positive effect on student learning and performance. However in the control group (Class C), student work maintained approximately the same level of achievement, averaging 3.382 (standard deviation of .761) on the pretest and 3.467 (standard deviation of .667) on the final essay. Considering that students in this class did not receive any additional instructional tools, it is clear that extraneous variables made little to no impact on both sets of scores. In addition, the national averages 4.44 (pre-test) and 4.67 (post-test) released by the test producers are relatively close to the distributions of these students, suggesting that these classes were not outliers.

In order to triangulate data and provide a more comprehensive analysis of student work, the qualitative evaluation of essays and class discussions further suggests the efficacy of graphic organizers in poetry analysis. Class A, the group that received the TPCASTT organizer, showed significant strides in effective poetic analysis from the initial essay to the summative one. In the first essay, students showed a lack of clear understanding of poetic devices as well as the language of poetic analysis. This changed drastically with the implementation of the TPCASTT handout. Furthermore, students were able to forge more abstract connections to the text after completing the TPCASTT. These essays and comments showed more engagement with nuanced poetic devices and thematic organization (rather than linear organization based on the poems).

For Class B, Venn Diagrams proved useful for students as well. For students who may have simply provided their interpretations of the poems with little to no analysis, the Venn Diagrams helped considerably. The nature of its visual-spatial representation of similarities and differences allowed students to find “things to talk about.” This proved to be advantageous for the students both in the regard and also with their tendency to cite textual claims using lines from

the poems. Students would first read the poem, then jot down some notes regarding what they saw in the text. It seems that this intermediate step helped to clearly delineate exactly what the student wanted to include in the comparative essay without having to refer back to the entire poem. However, students who lacked the proper language to analyze poetry (i.e. poetic devices, structures, etc.) did not find this aspect of their writing or analysis improved.

While achievement in the essays saw improvement, students found the tools to have little to no impact on their engagement. In class discussions, nearly all students still felt apprehensive about analyzing poetry, given their lack of experience. Results from a concluding survey showed an average response that suggested the tools provided “little to no help” on their essays. Further research on the effect of graphic organizers on engagement appears to be necessary.

As a result of these factors, I have been able to conclude that within this group of students, the implementation of graphic organizers suggested a positive impact on student achievement in analyzing poetry. While students who used these tools may have demonstrated success in raising their A.P. scores, the results for student engagement were more ambiguous. What we can conclude is that these high-achieving students may benefit from the content contained within them, but they do not find the visual-spatial representation of information inherently useful to the degree that previous studies have suggested.

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# The Effect of Journaling from Characters' Perspectives on Students' Engagement

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June 2012

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This study seeks to expand on research regarding the role of writing in the classroom and its effects on student engagement with a literary text. This study will evaluate students' understanding of a text through their engagement in class discussions in relationship to their written responses to character-journal assignments. Students will write brief, informal journal entries from the perspective of a character after reading through the course a unit. After writing, students will discuss the text as a class and engage in other activities where they will demonstrate their critical thinking skills and understanding of the text. The study seeks to investigate the effect of these character-journaling activities in a high school English classroom. The class periods will be video recorded and analyzed by the researcher by comparing recordings of classes that did not complete the character-journal assignment.

## **Literature Review:**

The English classroom is generally centered around two goals: 1.) to instill in students skills needed to critically evaluate and respond to texts, and 2.) to expose them to a variety of culturally significant works of literature (Milner, Milner, & Mitchell, 2012). Teaching writing in concurrence with reading assignments addresses both of these goals, as writing provides a context for critical thinking. Langer and Applebee believe writing aids in the development of critical thought, as "Written language not only makes ideas more widely and easily available, it changes the development and shape of the ideas themselves" (1989, p. 3).

Therefore, writing helps students develop their own skills in both interpreting and creating literature. By providing variety in the types of writing assigned, such as using both creative writing and formal, analytical approaches in the classroom, students learn to respond to literature in different ways. This variety serves to both pique their interests in writing and increase their confidence as readers and writers.

M. Salvatori (1985) has paired journaling and personal-response writing assignments with reading in her classroom as a method to help students discover their own voices in

writing. She argues that, by pairing expressive writing assignments with reading, students have shown to be more involved in discussions and other activities. Students' attitudes changed from passive (merely answering questions posed by the teacher) to active and dialogic, as they began asking their own questions and engaging in discussion with one another. Writing assignments have the potential to inspire students to take ownership of their interpretations and ideas towards literature (Salvatori, 1985).

Characterization is a simple, yet complex way to inspire students to think critically about a text, and, with specific regards to writing, character perspective is a useful tool. Students responded positively to a study by Wong, Kuperis, Jamieson, Keller, and Cull-Hewitt on the effect of "guided journals" regarding characterization and theme (2002). Students stated, in interviews, that the character journals challenged them to think critically about the text, generate more ideas, remember the subject matter and specific details, and made them more enthusiastic about class discussions (p.187). In addition, teachers responded to the study, saying the character journal activities helped them focus on aesthetic aspects to the novel, a subject that is usually challenging for students.

Character perspective provides insight into a work of literature, but can also serve as a jumping-off point for discussion and critical thinking in a broader context. Smith and Wilhelm emphasize the importance of creative writing to teach students the process of reading to understand a text, not only what to understand about a specific text itself (2010). By responding to texts using creative writing assignments that focus on character, setting, point of view, and theme, students explore the metacognitive aspects of reading and writing. Understanding such aspects of literature in their own writing would help students to recognize them in reading, which would in turn promote critical thinking skills and confidence. Once again, the issue of confidence raises the important link between writing and ownership of ideas and participation in class activities (Salvatori, 1985).

Journaling provides students with a way to informally explore their thoughts and prepare for discussion (Bangert-Drowns, Hurley, & Wilkinson, 2004). However, journaling specifically from the perspective of a character invites students to engage in creative writing. Imaginative, creative writing assignments encourage innovative thought and allow students to internalize information about the significance and craft of formal elements of style in writing (Adams, 1989). The purpose of this study, then, is to evaluate the impact of writing from the perspective

of a character on students' engagement with the text, shifts in insights in writing, and participation in classroom discussions and activities.

### **Methodology:**

As a qualitative action research study, the data was collected in the form of original work by students, teacher reflections after class regarding participation and responses from students in class discussions, and information from student surveys. Having control of the environment as the teacher allowed me to assess the research variable's impact on the study and avoid some questions of validity that are raised in non-action research studies (Arthanases, 1996, Wong, Kuperis, Jamieson, Keller, & Cull-Hewitt, 2002). In addition, in knowing my subjects, I ideally received more honest reactions and comments from students and was able to track changes in their behaviors and/or understandings.

Students were asked to sign and return a parental consent form as well as a student assent form in order to participate in the study. Participants were not required to complete any extra work as a result of agreeing to participate in the study. For this study, students were asked to write in journals after reading. Students wrote for approximately ten minutes from the perspective of a character from Elie Wiesel's *Night*. A few questions were provided to guide them, such as, "How did you respond when \_\_\_\_ happened?" or "How do you act differently than Wiesel?" To measure the effect of journals on students' engagement in discussions and the types of insights presented in such discussions, some days students were asked to write "guided" journals, in which they responded personally or wrote found poetry, for example. Other days journaling was skipped altogether.

After journaling, class continued through its usual course of discussions and activities. Since the study is measuring student engagement as a result of these journaling activities, students' journals were analyzed as a way to gauge whether students' can demonstrate their understandings and interpretations in creative ways.

At the conclusion of the research period, all students were asked to fill out a quick survey about the journaling activities. Although all students were asked to fill out the surveys, only responses from students who received parental consent and agreed to take part in the study themselves were recorded and analyzed.

## Results and Discussion:

The subjects were 28 students in a tenth grade, honors world literature class composed of seven girls and 21 boys. None of the students were repeating English II.

In the survey data (questions based on a Likert scale), students revealed what they thought about the character journals—whether they liked them, if they helped them understand the plot and themes of *Night*, and if the journals helped them to feel comfortable talking about *Night* and their literary interpretations and insights. Although there were 28 students in the class, only 22 responded to the survey.

One of the goals of the character journals, especially with such a dark historical context as the Holocaust, was to help the students to gain an understanding of the events history through exploring characters' perspectives. Beyond simply writing from the point of view of the character, students explored characters' worldviews in conjunction with the plot and themes of the text. In an effort to help students sympathize with the characters, we asked them to imagine they were in the Wiesel family's place when writing their journals. Although in my observations, students seemed (and discussed being) much more personally engaged in reading *Night* than the other texts from the semester, I also asked them in the survey if the character journals helped them personally connect to the text. In response to this, twelve students selected "agree" and three students selected "strongly agree." One student commented, "I really liked how personal the reading became. I felt like I had watched my family separate and die. I actually got very close to crying when picturing my little sister in Tzipora's place." While several students stated that they felt more connected to the text as a result of the journaling, one student stated the assignment, "helped my analysis on characters, as I found myself understanding situations I would have never been able to comprehend."

Students expressed that writing the character journals made them more likely and willing to participate in class, as three students selected "strongly agree" and seven students selected "agree." Students were engaged in the unit from the start, but their conversation and willingness to discuss became more focused as they discussed the novel and their journals. The students were able to make some specific and clear points about the memoir and the Holocaust. While a few students contributed strong ideas and observations regularly during class discussions, more students were willing to contribute to the *Night* discussions than usual. However, their curiosity



towards WWII and the Holocaust was apparent from the start of the unit, and their heightened enthusiasm in class discussions cannot entirely be contributed to the journals.

Many of the students expressed more confidence in discussing their interpretations, analyses, or responses to a piece of literature than in responding through writing. One student remarked, "I liked being more involved with all the reading and discussions [as a result of the character journals]. I don't like writing a lot cause I don't think I'm that good." Through the course of the unit, many students who were generally quiet, such as the student who made the previous statement, took a more active role in class discussions and asking/answering questions with their peers. In this regard, the journals seemed to equip the students with something to contribute to class discussions. In my personal observations, students were more comfortable asking questions and participating in discussions, sharing their interpretations or personal responses, and even responding to literature in writing. The journals placed more of an emphasis on reader response, as I emphasized that there were no wrong answers and that I wanted students to respond to the details or passage that resounded most with them.

Many students' journals demonstrated their knowledge of and ability to recognize themes in the text. The insights in their responses do not seem to align with their confidence as writers and thinkers. Many of the students were clearly able to create examples of certain themes from the text, but some of them struggled to identify themes from passages or events in the text on quizzes and tests. This seems to demonstrate that the character journals allowed students to express their internalized knowledge of literary elements such as themes.

Although this study was not designed to measure students' growth in writing, the students' work demonstrated, for many, a strong growth in writing. Many students did, however, agree that the journal writing and focus on character perspective made them more comfortable writing about literature. The students writing did help them to focus their discussions and helped some students to feel more comfortable or equipped to respond in class.

There were a few limitations in this study. Working as a student teacher, I had a considerable amount of freedom in selecting supplementary short texts, such as short stories and poems, but I was unable to select the novels to read in class or the order in which to read them. Therefore, with the timeline in place, I did not have the ability to choose *Night* as the text to use in this study.

*Night* was a great text to use in the study in many regards, but I also had a few reservations about it. The students were already interested and curious about WWII and the Holocaust, so in that regard, it was difficult to gauge the impact of the character journals. My reflections and observations shifted, then, to what students asked and discussed and how they did so, rather than if they were asking and discussing and how much. However, if I were to repeat the study, I would have filmed an early class at the start of the unit as a pre-test and filmed a class towards the end as a post-test. This would allow me to transcribe conversations in class and draw more objective conclusions. In addition, small groups could have recorded their discussions on a tape recorder, which would have served two-fold as an accountability measure and a way to more objectively study students' insights and points of focus in the text.

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## **Ephemera in the Classroom: Creating Lasting Knowledge from Temporal Objects**

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June 2012

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As technology continues to evolve and grant teachers with greater access to historical materials, it is important to examine whether these sources are being used to their full potential. With the abundance of materials that teachers can now access via the Internet, in particular primary sources, it can be daunting to determine which of these materials will yield positive results in the class. This, of course, means that often times some documents are overlooked in favor of more calculable materials. The discourse on the use of primary documents in the classroom archetypally has focused on items such as diaries, speeches, or famous photographs. While these items work wonderfully in tandem with scaffolded instruction to foster historical and critical thinking, they are not the only kind of primary sources that provide students with a glimpse into the past. The use of ephemera, defined by the Ephemera Society of America (ESA) (2011) as, “a broad range of minor (and sometimes major) everyday documents intended for one-time or short-term use” (online), in the classroom as a primary source is a relatively under-studied field of research. This study aims to engage with ephemera and discover whether it is an effective tool for promoting historical thinking skills.

### **Literature Review**

For years now, historical thinking has become one of the most frequently discussed topics in the discourse on social studies education (ie. Wineburg, Seixas, VanSledright, Barton). Seixas’ (1993) posits that historical thinking comprises of three key elements. First, students should be able to isolate historically significant events and rationalize their significance. Second, a student’s conceptualization of history should be malleable and account for new, sometimes conflicting information. Third, is the ability to empathize with inhabitants of the past, understand their individual agency, and make moral judgments on their actions to create meaning (Seixas, 1993). Historical thinking requires that students actively engage with historical materials and develop their own perspectives rather than using rote memorization to “learn” about history.

Students can begin to learn how to think historically through a variety of methods. One key component of teaching historical learning is the use of source work. VanSledright (2004)

defined source work as the investigation of artifacts of the past, which are often referred to as primary sources. These artifacts can consist of various objects such as writings, household articles, or something that inhabitants of the past would have considered trash, like ephemera. Using historical thinking as previously outlined, students will interact with the materials as critical consumers. VanSledright (2004) also argues that to effectively teach students to think historically, it is important teachers scaffold their lesson to provide the proper amount of instruction while still allowing the students to be the primary investigators.

Visual materials have also been shown to reach students at various learning levels and help students engage in critical thinking skills. As noted by Felton and Allen (1990) when used as the principal focus in scaffolded instruction, visual materials can creatively engage students. Unlike the words of a textbook, pictures allow more room for interpretation, a capstone of historical thinking. Another study conducted through the Wolfsonian Museum in Miami, Florida found that students that typically performed at different levels were still able to engage critically with the visual materials the museum supplied (Rawlinson, Wood, Osterman, & Sullivan, 2007). Compared to the control class, students that partook in the Wolfsonian's program saw improvements in both their math and reading scores (Rawlinson et al, 2007). In addition to improving literacy in students, visual materials have the added bonus of being accessible to students that are below grade level.

Since ephemera fall under the categories of primary source and visual material, both of which have been shown to be beneficial to student learning, it should be reasoned that ephemera would also be beneficial in the classroom. The objective of this study is to determine whether or not ephemera are useful tools for building historical thinking skills in the social studies classroom?

### **Methodology**

To measure whether ephemera are useful tools for building historical thinking skills, this study looked at the historical thinking skills of the students that participated in the study before and after using ephemera in the classroom. A historical thinking rubric was composed that consisted of commonly cited factors of historical thinking. This rubric measured the students' ability to recall prior knowledge, recognize historical importance, synthesize malleable conceptions of history as new information is processed, and to critically engage with the sources.

This rubric consisted of four categories: use of prior knowledge, use of documents, synthesis statements and thesis statements.

This study was conducted using one honors United States history class, which consisted of twenty-two students. The study took place over the course of three weeks. It began with a pre-assessment, which consisted of a document based question on the causes of World War I, a unit the class had just concluded. Each of the participating essays was graded according to the historical thinking rubric outlined above. Following the pre-test students worked with ephemera for five days over the course of two weeks of class. They analyzed advertisements and other ephemera from the 1920s, 1930s, and 1940s using scaffolded worksheets, discussion and Venn diagrams. Each item of ephemera used during the study was chosen because it represented the cultural, political and economic concerns of Americans during their respective time periods.

After these five lessons were completed, students were given a post-test, which consisted of a document based question about the causes of World War II. At the conclusion of the study, data was collected from the pre-test and post-test, as well as student work completed during the course of the study. Each piece of data was coded looking for certain indicators of historical thinking. For the pre-test and post-test, essays were coded looking for the four factors which coincided with the historical thinking rubric; strong thesis statements, use of prior knowledge, use of primary sources, and analysis statements. Student work from the duration of the study was also collected for analysis. The responses were coded as absent/weak, developing and strong based on the level of engagement with the ephemera and the strength of analysis.

## **Results**

Out of a total of sixteen points, students scored an average of 12.14 on the pre-test. The median score was 12.5 and the mode score was fourteen. The scores ranged from seven out of sixteen, the lowest score, to fifteen, the highest score. Since the document based questions were used to measure historical thinking, the documents were examined for the following: development of thesis statements, use of prior knowledge, and use of documents and analysis statements. Out of twenty-two students, only six wrote a strong thesis statement as defined by the historical thinking rubric. Most students did a decent job of using both prior knowledge and primary sources in their essays. However, eight of the twenty-two, over a third of the class, prominently utilized only one of these elements. Out of those eight, six students relied too heavily on the accompanying documents, while two relied too much on prior knowledge. The

same number of students, only one third of the class, wrote analysis statements in their essays. These statements are the result of combining prior knowledge and primary sources and they reflect the writer's unique interpretation of events.

For the post-test students were asked, "Why was the world plunged into WWII in 1939? What is the most effective response to aggression – appeasement or collective security?" Out of a total of sixteen points, students scored an average of 13.1. This is a full letter grade improvement over the pre-test. The median score was 13 and the mode score was fifteen. The scores ranged from ten out of sixteen, the lowest score, to sixteen, the highest score. Overall, these numbers indicate that the students made slight progress since the administration of the pre-test. Eleven students wrote what are considered strong thesis statements, a large improvement over the six that wrote strong thesis statements during the pre-test. Improvement was limited to this facet of historical thinking and the post-test scores remained the same for use of prior knowledge, primary sources and analysis statements.

Student class work from this study was also collected and consisted of two worksheets and a Venn Diagram. The results for these worksheets indicate that, for the most part, these exercises worked well for the students. The use of these advertisements reinforced the important economic trends of the era that had an enduring impact for many Americans and students were able to identify important trends in the advertisements. The majority of students that participated in these activities, ten out of sixteen, received a grade of "excellent", which meant they provided insightful analysis of the ephemera studied. The students that performed poorly during these exercises did so not because they did not understand the advertisements or lacked prior knowledge. Instead, they did poorly because they did not attempt to answer the worksheets. For students that did put forth an effort, the exercise was a success.

## **Discussion**

Using the pre-test and post-test as indicators of historical thinking skills, as the study was designed, students demonstrated little growth in historical thinking skills after the use of ephemera in the classroom. However, the average test score did improve by 1.86 six points. Additionally, the students also showed improvement in thesis statement development. Eleven students wrote strong thesis statements during the post-test, a considerable improvement over the six that wrote strong thesis statements during the pre-test. However, this is not enough evidence to conclusively prove that ephemera is an effective historical thinking tool. Although the overall

average on the post-test test, as well as the increase in students that wrote strong thesis statements, seem to indicate positive growth in the historical thinking skills of the students in this study, they were stagnant in two very important areas. The amount of students that balanced their use of prior knowledge and primary sources remained the same. The same is true of the amount of students that used analysis statements in their essays. Since these are also key components to historical thinking, it is concerning that most students did not use them effectively.

While the pre-test and post-test do not indicate that students developed better historical thinking skills after analyzing ephemera, the worksheets indicate that students, when given scaffolded worksheets or guided questions, were able to engage in historical thinking. As shown in the results, a vast majority of the students scored an “excellent” on their worksheets and only a couple scored poorly. Most students provided well thought out answers that showed they were able to analyze a piece of ephemera and think about in a historical context. Furthermore, the Venn diagram illustrates their ability to make important connections between the content of the ephemera and how it is reflective of the historical time period. By successfully comparing advertisements from the 1920s and 1930s, students were able to reflect on the social and economic issues that were prevalent during each time period. This is a great indicator of historical thinking as defined by Wineberg and Seixas.

There were a few limitations that appeared during the course of the study which complicated the analysis of the results. First and foremost, the pre-test and post-test model was not the most effective measurement of historical thinking for the class that participated in the study. The students in this class were not the strongest writers. In fact, many of them were severely lacking in writing skills. As a consequence, it was hard to discern historical thinking from their document based questions because of poor conventions and lack of ability to adequately express a unique historical viewpoint. Another problem that presented itself during this study was student attendance. Very few of the students in the class were present for all five of the days that the class worked on historical thinking with ephemera. As a result, this makes it much more difficult to determine whether the use of ephemera was successful. Since not all the students were present for each session it is very likely that they were not able to reap the benefits of using ephemera to develop historical thinking skills, which possibly had an effect on the results. Additionally, this meant there were less student worksheets to analyze for data. This is problematic because in this class being studied, the most studious students were less likely to

miss class. This could have had an impact on the results of the daily classwork since some of the more poorly performing students were not present each day.

### **Conclusion**

Although the data remains inconclusive, I will continue to use ephemera in my future classrooms as primary sources. While the post-test and pre-test suggest that no growth occurred, I believe that the student worksheets show that the majority of the students that participated in this study displayed an interest in the ephemera and with scaffolded questions they were able to think historically. Overall, historical thinking is not something that can be developed over a few short weeks. It takes longer for students to accrue those skills and I plan to see what the effects of using ephemera over a longer period will have on students' historical thinking skills.

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# Can Problem-Based Learning Address Stereotypes in Science to Help Female High School Students Create Scientific Identities?

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June 2012

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Although past trends among gender differences in education have narrowed, an inequality in science education continues to persist. Over the years, research has proposed many possible explanations to understand this problem, indicating its complexity and importance in educational research. Today, popular theories in social psychology have led researchers to look at negative stereotyping and its effects on female students' abilities to construct scientific identities. This study sought to address three of the most common stereotypes using a three-component framework of a popular, student-centered instructional method: problem-based learning. Combining data from surveys, interviews, and observations, this study sought to identify and alter negative stereotypes among female students in a high school chemistry classroom.

## Review of Literature

Since the early 1980's, American policy makers have acknowledged the need to improve student achievement in mathematics and science. International assessments in these areas highlighted the lack of quality in the American education system (National Education Goals Panel [NEGP], 1999). In 1983, after releasing the report *A Nation at Risk*, the National Commission on Excellence in Education emphasized the drastic change needed in education if American students were to remain globally competitive. National and State government officials answered *A Nation at Risk's* call to action by holding the first National Education Summit, which led to the adoption of eight National Education Goals. The fifth of these goals states that by the year 2000, "U.S. students will be the first in the world in mathematics and science achievement" (NEGP, 1999, p.8).

Today, the fifth National Education Goal has expanded to include special consideration of female students in mathematics and science (NEGP, 1999). As a result of the gender gap in education, State Indicator 20c of the National Education Goal Report charges states with the responsibility of increasing the percentage of mathematics and science degrees earned by females. Fortunately, recent data collected by the National Center for Education Statistics

suggests a dramatic narrowing of this gap. For example, females in the mid-1990's were just as likely as males to attend college upon high school graduation and obtain a Bachelor's degree. Although females may be just as likely to attend college as males, findings reported that females were less likely to choose mathematics and science majors. However, the *Women in Mathematics and Science report* found that a gender gap among student attitudes in science does not emerge until the tenth grade (Bae & Smith, 1997). Therefore, factors other than just gender bias in the American educational system and student interests must be affecting females' ability to achieve in science *and* pursue it as a career path. The question then becomes, what is causing the gender inequality persisting in science education?

Around the same time that the findings from *Women in Mathematics and Science* were released, a social psychologist by the name of Claude Steele introduced the term *stereotype threat* and identified it as a possible answer to this question (Steel & Aronson, 1995). Steele and his colleague defined *stereotype threat* as a "social-psychological predicament that can arise from widely-known negative stereotypes about one's group" (Steel & Aronson, 1995, p. 797). Negative stereotypes regarding female achievement are not the only factors influencing stereotype threat in science education. Science itself has developed a stigma, which according to the research, is in direct opposition with female career aspirations.

Steele explains that people may need to protect themselves from detrimental self-evaluations posed by negative stereotypes through redefining social identities, a process he calls *social identity threat* (Steele & Aronson, 1995). In multiple studies, he showed that when negative stereotypes are attached to a person's social identity, the person may act in accordance with that stereotype, leading to decreased interest, motivation, and performance (Steele, 1992). In addition to the effect that social identity threat has on female science achievement, it can also result in females adopting alternative identities.

These threats posed by stereotypes and their resulting social identities can ultimately impact the ability of females to learn science. Based on the work of Lave and Wenger (1991) and their perspectives on situated cognition theory, learning should be viewed as the process of identity formation. Therefore, an important conclusion can be made regarding females and their ability to learn science: in order for females to learn science, they must create identities which they perceive as consistent with and reflective of the identities of scientists.

Because research has shown the detrimental effects of stereotype threat on student identity, it makes sense that addressing stereotypes will sequentially improve scientific identity and ultimately impact female learning and performance. One way to address stereotypes is through a curriculum instruction method known as problem-based learning (PBL). According to Maudsley (1999), PBL seeks to answer a relevant and contextual problem, builds on prior knowledge to develop critical-thinking, and facilitates collaborative group work.

Each component mentioned above in Maudsley's framework can be used to address common science stereotypes identified in the literature. Specifically, these stereotypes are that science is uncreative, boring, and challenging (Jones, Howe, & Rua, 2000; Miller, Blessing, & Schwartz, 2006); science is not available females (Carlone, 2004); and science is an individual and uncooperative endeavor (Parsons, 1997).

The focus of this research study was to use PBL to alter common science stereotypes and lead to the creation of female scientific identity, increased learning, and increased performance. On a much broader scale, beyond the scope of this research study, improved female performance should ultimately have a positive impact on the gender gap persisting in science education.

### **Methodology**

Using action research to conduct my study, I implemented problem-based learning (PBL) methods as part of normal classroom instruction to teach twenty-five high school chemistry honors students. This study was conducted during my student teaching internship in a high school located in a mid-sized city in the southeastern United States. I used a process known as triangulation that drew upon three main sources of data: observations, interviews, and, surveys. The PBL activity itself focused on developing a solution to the environmental problem, acid rain. Student artifacts were also used to corroborate assertions made during the analysis of my data. After all of the data was collected, I analyzed it using a three-step method suggested by Gay, Mills, and Airasian (2009) that involves making initial impressions, disaggregating data into codes and categories, and classifying the identified themes. I also employed the use of descriptive statistics to identify trends from the surveys' Likert scale responses.

### **Results**

Results from student surveys and interviews indicate that PBL does in fact help females, in particular, learn science. First of all, pre-survey and interview data revealed that females in the class were not only interested in science, but also preferred teaching methods

(group-work, laboratories, discussion) that are characteristic of PBL. However, their responses to the pre-surveys and interview questions clearly indicated that their opinions about the nature of science could be negatively impacting their ability to identify themselves with other scientists. For example, female students generally disagreed with the statement, “*Most scientists are male.*” However, when asked during interviews how they view scientists, three out of the five females said they picture a male, either by actually saying “male” or “Albert Einstein” (IQ1.S2,S3,S4).

There was only one statement that the females outright disagreed with, which was “*Scientists do not have a life outside of their work.*” This particular response was supported by interview data that indicated the majority of females in the class enjoyed science and also engaged in science-related activities outside of school. However, all five of these same females responded “No” when asked “*Do you consider yourself to be a scientist?*” (IQ4.S1-S5). Furthermore, the statement “*Scientists spend most of their time in a laboratory*” resulted in a mode of 2 among female students, indicating that they do *not* view this statement as a misconception. Interview data also supported this particular misconception. When asked, “*What image comes to mind*” when you hear the word scientist, four out of the five responses included a reference to someone in a lab or someone wearing a lab coat

As a class, there was almost no difference between pre-survey and post-survey data with regards to science misconceptions. However, there was one misconception that showed a positive change. As mentioned earlier, the females slightly agreed with the statement “*Scientists spend most of their time in a laboratory*” more than any other statement. After the PBL, most females scored this statement a 4, and the entire class mode went from 2 to 3. Therefore, this statement exhibited the largest change between all seven statements, indicating that the lesson did help the class as a whole alter their view of scientists.

Although many misconceptions about scientists were not necessarily overcome as a result of the PBL, there were some unintended effects that significantly impacted female students’ abilities to learn science. At one point, I was so worried that their frustration would leave them with a negative opinion of problem-based learning that I displayed a list of possible materials that could be used to help them develop their procedures. However, their post-surveys indicated that having to “think” about the problem (PoS.Q2.S4,S7,S19), “figure out” the problem (PoS.Q2.S1,S2,S4,S10,S13,S16,S18,S21), and “choose” their own procedures and experiments

(PoS.Q3.S6,S15,S17,S22) were what they liked *best* about PBL and its ability to help them learn science.

Another interesting trend emerged among female and male responses to the questions “*Describe what you liked best and least about PBL.*” The females’ responses were linked to their emotions, while the male students pointed to specific concrete examples that they felt were missing from the PBL. These emotional reactions to the challenging lesson seemed to help the females connect more with the lesson, which led to a better understanding of the material.

The challenge felt by the females is what, in my opinion, was the most significant and unexpected outcome in this study. In fact, one in particular wrote, “I would like to pursue a career in science now because you never know what’s going to happen. It’s like a puzzle you have to fit the pieces together” (PoS.Q1c.S12). So, even though perceptions about science and scientists were not necessarily changed as a result of the PBL, some of the females were able to experience the challenging, true nature of science and as a result are now considering science as career path.

These significant outcomes may have only affected a few, but the class as a whole benefited from actual topic of the PBL: acid rain. Before introducing the lesson, I engaged the students in a bell-ringer activity that required students to write a definition for acids. Only 27% of the students mentioned pH in their definition, and the majority of these descriptions, 73%, were incorrect. Almost two weeks after completing the PBL, I then covered acids and bases as part of the curriculum. This time, 76% of the students mentioned pH, and of these responses, they all correctly described acids as having a low pH. So although the lesson did not go into detail about pH, the students explored it experimentally in their PBL activity and were able to alter their misconceptions.

### **Discussion**

Results from this study found that while females may be interested in science and even plan on pursuing science careers, they are not immune to the effects of holding on to deeply-rooted misconceptions. There were also unintended findings that proved even more significant. First, students were challenged to think through the necessary steps, have meaningful discussions with their group members, and create their own solutions. Second, by shifting the perspective of the lesson from teacher-centered to student-centered, the students were able to experience the curriculum of the PBL for themselves rather than it being assigned to

them, ultimately leading to their understanding. Third, the challenges presented caused the females to emotionally connect with the activity, and in doing so, produced positive results.

Overall, I am encouraged by the results of this study and see its implications for both teachers and students. Although the frustrations ultimately benefited the students, there were unnecessary challenges that could have been avoided. Had the students been introduced to PBL in the beginning of the semester, they would have been more confident in their abilities, thereby reducing the amount of class-time spent on the assignment. Also, If the students had not been all honors-level and already interested in science, it is possible that PBL could have had more of an impact on altering students' misconceptions of science. The female students' unexpected emotional responses provide an interesting area for future research. Because the *ways* they responded to the PBL was not the focus of this study, it would be worthwhile to design research around multiple PBL activities with varying degrees of emotional relevancy or controversy.

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## Peer-teaching, Group Presentation, and Students' Understanding of Physics

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June 2012

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According to a study performed by Neuschatz, McFarling, and White (2008) with the American Institute of Physics, the enrollment of students in high school physics has steadily grown, the gap between the male and female students taking physics has steadily decreased, and the number of students enrolled in honors, advanced placement, and second-year courses has almost tripled since 1990. At the same time, the funding for lab equipment and teaching supplies has decreased. This data means that while there are promising trends for the number of students who elect to take physics, there is not the same level of budgetary support for the growing numbers. As a result, it is vitally important to make the most of one's budget and to employ the most effective teaching strategies for the content material.

I hypothesize that creating an environment of student creativity and collaboration in physics can help to teach concepts and make class more fun. When students understand the content material, they will tend to feel better about themselves and enjoy the subject more. Being a teacher, I am a strong proponent of the idea that teaching a topic to another person forces you to learn it better yourself – so I proposed to translate this idea to the classroom (Ramaswamy, Harris & Tschirner, 2001). As I will highlight later in this paper, there is a growing amount of research supporting the efficacy of both group work and presentations as learning strategies. As a result, I pose the question: does the use of student group presentations to teach new material to peers as a teaching strategy improve student content knowledge in a high school physics class? In order to teach material to others, a student must first understand the material. Additionally, the fun and creativity involved in group presentations will lead to the presenters and their classmates learning the new content more effectively. The creative aspect to this strategy is very important. Students must be given the freedom to present their assigned content material in whichever way they would like, as long as it is effective and adheres to the guidelines of the rubric which will be handed out. With this approach, not only does it force students to learn the material well enough to teach peers but it also draws upon the strong social networks that exist in a high school. As shall be explored in the following review of related literature, the reader will see that there is

considerable research on the effectiveness of group work, student presentations, and peer teaching in the classroom at a variety of educational tiers including the high school, university, and graduate school levels. The sweeping successes of these various teaching strategies are a testament to how well they work in educating students and it is not a far stretch to consider that the results of a combined strategy of these three approaches would be extremely beneficial to students in a high school physics class.

## **REVIEW OF LITERATURE**

In looking at prior research on this topic, Magney (1996) found that group work enhances student learning of course content, promotes the development of academic skills in group processes, and encourages student involvement in courses. One major finding from Magney's questionnaire of faculty at the College of Technical Careers at Southern Illinois-Carbondale was that instructors who used small group teaching techniques found that those students who were assigned to groups were more likely to have higher grades, learn more, and learn more quickly than students who worked individually. Group work in physics also allows students to relate differing perspectives of the content material to each other, leading to increased understanding. This variation in perspectives on material helps to compose a complete picture regarding a concept when individual students may only be comprehending a part of the whole (Ingerman, Berge, & Booth, 2009).

Presentations can be extremely helpful in physics education because they require so many different skills that may not be explicitly addressed in a physics curriculum. Specifically, oral presentations have been found to strengthen students' understanding and views of mathematical concepts (Kagesten & Engelbrecht, 2007). Presentations can help students acquire a spoken mathematical language. Being heavily reliant upon math, it is of vital importance that students be comfortable with all of the symbols, functions, relationships, etc. that make it up. It would be difficult to claim that one has learned physical or mathematical content well if he or she were not able to clearly communicate what has been learned. A study in the undergraduate engineering program at the Norrköping campus of the Linköping University had students go through a process of five learning experiences with oral presentations: "preparing the presentation, presenting the mathematics, listening to others presenting, discussion by all students after the presentation, and feedback by the teacher to the small group of students" (Kagesten &



Engelbrecht, 2007). Students, in addition to teachers, gave positive feedback regarding the use of presentations as a tool for learning and assessment in undergraduate mathematics, with students displaying an increased understanding of the material. Coupled with teacher input, students were “almost unanimous” in their appreciation for an increased ability to speak to a crowd and to communicate in the language of mathematics. While this study took place in an engineering program, it does not require a significant stretch of the imagination to see how the use of presentations in physics could reap similar benefits considering that physics and engineering share many commonalities. The proposed research study in this article also allowed students to have much greater breadth of choices for presentation method than just oral presentations, emphasizing the creative aspect.

In addition to creativity, this study also places an emphasis on self-motivation and responsibility. I hypothesize that if a student is responsible for teaching brand new material to his or her classmates, then that student will feel responsible to the class and to his or her self. This perspective is a shift from the antiquated authoritarian model in which a teacher’s primary job is to transmit knowledge to students. When tasked with peer teaching, students could be quite capable themselves of assuming the responsibility to effectively teach others. According to Ramaswamy, Harris & Tschirner (2001), some students may express concern that they would not learn as well from a peer as from a teacher, thus it is necessary to incorporate a teacher or instructor as a guide or mentor during peer teaching. Evaluation methods designed to emphasize student self-monitoring of progress and self-assessment can also help to gauge how well learning is taking place. Student peer teaching, especially in science education, also helps in preparation for professional careers due to the required use of teaching and presentation skills (Ramaswamy, Harris & Tschirner, 2001). In this day and age of standardized testing, it can be difficult for teachers, administrators, and parents to remember that a well-rounded education includes more than simply an understanding of various subjects. Children must also learn to respect themselves and others, how to communicate, how to work with others, how to create, and how to take responsibility for themselves. Peer teaching can help students, both tutors and tutees, with regard to grade point average, familiarity with learning strategies, and social skills that could be of help later in life (Arco-Tirado, Fernandez-Martin & Fernandez-Balboa, 2011).

## METHODOLOGY

This study took place in an honors physics class at a large suburban high school in the southeastern United States. The participants included twenty-three physics students, most of who were in 11<sup>th</sup> and 12<sup>th</sup> grades. One entire class of students from a physics class that I student-taught was asked to participate in this study. A different honors physics class of nine non-participants was considered a control group against which the results from the experimental class were measured. At the beginning of a new unit on projectile motion, students were assigned into groups of two to four and given the task to create a presentation that was intended to teach their classmates about a specific topic from the new unit. The presentations were open-ended, meaning that students could present using any kind of medium that they chose so long as it effectively taught the new content. Presentations were no longer than ten minutes, so as to be able to finish all of them in one 90 minute class period. Students were given a rubric to follow in the design of their presentations, but were left a lot of freedom for creativity. As part of the assignment, students first learned the content themselves from the various sources in order to teach their classmates. I matched this research study to a unit focusing on projectile motion, g-forces, horizontal motion, and free fall. To collect data, I used observation notes, a unit test, and a post-survey. I video recorded student presentations and took notes while watching them at the conclusion of the study. The video and observation notes were used to reveal the level of engagement of the students in the class through their questions, comments, and body language, along with the effectiveness of the presenters. The unit test was a standard formal assessment that was used in all of my physics classes, not just the one class in which this research study took place. This test assessed how well students learned the material from the presentations in addition to other material from the unit not covered in the presentations. The survey was developed by myself and consisted of a section of Likert scale questions and a section of open-ended questions. The survey indicated what the experience was like for each student in the group process of creating the presentation.

## RESULTS AND ANALYSIS

Based upon the data gathered from this study, it appears that there were mixed results regarding the use of peer teaching through group presentations. As one can see from the

observational notes taken during the presentations, three of the seven groups elicited interest and engagement from the class. This was ascertained by paying attention to students' body language, questions, attentiveness, and responses. It was my hope that if students are engaged by the presentations of their peers, then they will learn the new material more effectively. Unfortunately, this hinges entirely upon the quality of said presentations and puts the responsibility of education strongly in the hands of students which may not be something to which they are accustomed. According to the survey data that was collected following the presentations, students found that their groups worked and communicated well during the creative process and that their peers were respectful during their presentations. These findings lead me to think that there is merit in the process of working in groups and presenting, even if the quality of some presentations were questionable. Being able to collaborate, create, and present are invaluable skills that can be helpful in the lives every single student and exemplify 21<sup>st</sup> century learning. Students responded just slightly in favor of finding their classmates' presentations to be engaging and recommending the use of this teaching strategy again in future classes. The average score on the unit test for the participating class was twenty points higher than the class that did not participate. However, it should be noted that the other honors physics class being compared in this study was originally a standard level class and consistently performed fifteen to twenty points lower on average than the participating class on unit tests.

## CONCLUSION

These findings are important because, overall, it does not appear that the use of group presentations was any more effective at teaching new content material than other methods. That being said, while the test average was about the same as in previous units, students were supportive of the use of group work. I believe that the survey data collected for this study is useful for researchers and teachers in the future as evidence that this pedagogical method was instructive in teaching students skills that can help them to succeed later in life. It can be difficult to effectively measure this aspect of the study and doing so was not my primary aim, yet if students enjoy working in groups then it is likely that they are benefiting from the experience in some way.

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# Reflective Journal Writing and Student Engagement

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June 2012

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Studies have shown that disengaged students do not perform as well in school as their more engagement peers and are more likely to drop out of high school (Archambault, Janosz, Fallu, & Pagani, 2009; Finn & Rock, 1997). Furthermore, research shows that many students become more disengaged with school as they move from the lower grades to high school (Marks, 2000; Skinner, Furrer, Marchand, & Kindermann, 2008). Additionally, Skinner & Belmont (1993) found that teachers have a tendency to focus their attention on engaged students and withdraw support from those students who are disengaged, leading to a pernicious feedback loop and resulting in lower engagement over time for some students.

Research has focused on many factors that have the potential to improve engagement. Teacher support and student self-perceptions of competency, autonomy, and relatedness are several factors that research suggests can improve student engagement (Skinner, Wellborn, & Connell, 1990). Wentzel (1997) showed that students who perceived their teachers as caring were more likely to put forth more effort in academic pursuits. Student voice and empowerment are also associated with higher levels of engagement (Frymier, Shulman, & Houser, 1996; Logan & Skamp, 2008). In this research, I was primarily interested in student voice and student empowerment as promoters of student engagement.

I believe that writing can also be used in the classroom to empower students, and in this study, student journal writing was used as an outlet for students to voice opinions, suggestions, and ideas. The hypothesis underlying this research was as follows: student voice, student empowerment, and teacher caring positively impact student engagement.

## Review of Literature

The term *engagement* is a ubiquitous buzzword in educational research. Many teachers and researchers agree that engagement is important, but in the literature many nuanced definitions of the term exist (Fredericks, Blumenfeld, & Paris, 2004). For example, Appleton, Christenson, and Furlong (2008) enumerate at least nineteen definitions of engagement found in

the literature. Fredericks and colleagues (2004), reviewing the literature on student engagement, argue that engagement is a multidimensional concept encompassing behavioral, emotional, and cognitive elements.

For the purposes of this study, I focused primarily on behavioral engagement. In a study conducted by Archambault and colleagues (2009), only behavioral engagement was associated with high school dropout. However, my survey captured some aspects of cognitive and emotional engagement because these are, in most cases, the antecedents of behavioral engagement. What I mean by behavioral engagement is made more explicit in the methods section, where I list the specific behaviors that I focused on during my observations.

Finn and Rock (1997) conducted a large study involving 1803 low-income minority students. They divided the students into three groups: academically successful school completers, academically unsuccessful school completers, and non-completers. After controlling for home background and psychological characteristics, they found that the three groups differed significantly in terms of behavioral engagement. Archambault and colleagues (2009) conducted a longitudinal study of almost 12,000 French-Canadian high school students and found that global (emotional, cognitive, and behavioral) engagement accurately predicted dropout. However, when the global engagement construct was broken down into its constituent parts, only behavioral engagement was found to predict dropout.

A classroom in which the students are empowered is, by definition, more democratic than a traditional classroom. Student empowerment requires a teacher who listens and is willing to adapt his approach to match students' needs (Brunson & Vogt, 1996). Many studies on empowerment have been conducted in the workplace, particularly in environments where burnout is a real issue. Laschinger, Wong, and Greco (2006) studied empowerment in the nursing profession and found empowered nurses are more engaged and less susceptible to burnout. Other related research showed that nurses feel more empowered when they are involved in decision-making processes (Laschinger, Wong, McMahon, & Kaufmann, 1999). While there are many ways of empowering students, my research will focus on empowering my students by soliciting their opinions and involving them in classroom decision-making processes. Mitra (2004) reported that high school students who participated in student voice activities – Public School Collaborative and Student Forum – experienced feelings of competency,

connection, and agency. Participating in these student voice activities empowered students and ultimately led to improved engagement.

Journals have also been used widely in science classes for a variety of purpose (Hanrahan, 1999; Park, 2003; Towndrow, Ling, & Venthan, 2008). However, most of them have focused on learning, inquiry, or literacy. Towndrow and colleagues (2008) conducted a small-scale study, in which students kept reflective journals in a science class, to see if the journal writing promoted inquiry. They found that the number and quality of questions increased over time. The authors mention other possible indirect benefits for teachers of student reflective journal writing, such as reducing teacher assumptions and improving the accuracy of lesson-planning.

Hanrahan (1999) researched the use of affirmational dialogic journals in an 8<sup>th</sup> grade science class at a Catholic high school in Australia. The journals allowed students to openly express their opinions and thoughts. The teacher read the journal entries and affirmed the legitimacy of the students' thoughts. In this study, the behavioral engagement of students improved dramatically. In fact, many of the students, who were disruptive in other classes, behaved much better in science class. Hanrahan (1999) speculates that a key factor in the success of the journals was the students' perceptions that their teacher cared about what they thought.

The following research question guided my study: Will reflective journal writing improve student engagement in a high school Biology class?

### **Methodology**

The present action research study was conducted at a diverse, high-needs public high school in a large suburban district in the southeastern United States. Nine students from my 1<sup>st</sup> period standard-level Biology class participated in this research study. In this research study, students kept reflective journals as a regular part of classroom instruction. Over a period of three weeks, students responded in their journals to prompts designed by me to elicit suggestions, ideas, or opinions related to some aspect of the classroom, which would enable me to modify instruction to better meet student needs. During this time, we covered the molecular basis of heredity, mitosis, meiosis, and simple inheritance. I prompted each day's journal entry with a question. For instance, I asked students to tell me why if they liked a particular activity and explain why. Journal-writing occurred sporadically during the last five minutes of each class

over the course of the three week study. I responded to each student's entries and attempted to use the information in the journals to inform my teaching. I analyzed the data collected from the videotaped observations, journals, and surveys. I looked for recurring themes that provided information about students' engagement in Biology class and how this related to aspects of my instructional approach. The mode values of the survey Likert responses were calculated. Additionally, the open-ended survey question was analyzed.

### **Results**

Does reflective journal writing improve engagement in biology class? Based on this research, the answer to this question is inconclusive. The journal was intended to be used as a tool to give students a voice in the classroom. However, it is impossible to know if some students were delivering the truth as they saw it or simply a version of the truth that they thought the teacher liked to hear. For example, one student who, based on my observations, appeared to be quite disengaged most of the time responded to one prompt by writing, "I really did like it...It was fun and creative...we always do fun labs and stuff!" I found this student's journal entries to be quite disingenuous, for the most part. Lacking confidence that the voices being heard are the authentic voices of his students, what is a teacher to do? Most likely, the teacher will simply maintain the status quo. This could lead to frustration on the part of the students and teacher, making the whole exercise a meaningless – and perhaps harmful – waste of class time.

Student voice, as captured in reflective journals, was the focus of this research, but over the course of the study it became apparent to me that other factors played a much larger role in cultivating and improving student engagement in biology class including relevance, a sense of community, and fun activities. For example, on the survey students mentioned that they pay attention in class when they "have fun" or "it relates to something we have experienced". On the occasions where student voices leapt from the pages of journals to the actual classroom, it appeared that engagement improved. For example, on the final day of the study, I allowed students to sit where they wanted and student engagement seemed high.

While I strongly believe that students should have a voice in the classroom, teachers need to be cautioned that some students may take a teacher's willingness to empower them as a sign of weakness. This could lead to classroom management problems in some cases. I often felt that my own ability to manage my students may have been undermined by the nature of my research study.



Overall, I did not see a huge change in engagement over the course of this research. It is impossible to know for sure whether the student engagement I saw on the last day of this research was the result of student voice and teacher listening, or some other factor. Student engagement fluctuated from day to day. On some days, students seemed disengaged. On other days, engagement seemed higher. Based on my observations and student survey responses, I believe that factors other than student voice play a larger role in improving student engagement including fun, relevance, and comprehension of the content. In short, students wanted to do fun and relevant activities that help them understand the material.

The present study has added one more story to the growing body of research on student engagement. This study will definitely inform my practice as a teacher. However, in order for student voice to have a positive impact on engagement, students must feel that their voices are being heard. Reading and responding to journals is a time-consuming process and may not be feasible for most teachers, especially new teachers who are still learning their craft. Furthermore, a gap of time exists between student suggestions and actual implementation, making it difficult for some students to see the connection between their ideas and teacher practice. In the future, I will probably elicit student voice by giving students a choice or allowing classes to vote. For instance, I could give students a choice of activities and let the students choose or vote for their favorite. In this scenario, students would instantly see the results of their choices. This could possibly increase student engagement.

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