

Studies in Teaching 2013 Research Digest

*Action Research Projects
Presented at Annual Research Forum*



WAKE FOREST
UNIVERSITY

Department of Education

**Winston-Salem, NC
June 26, 2013**

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Studies in Teaching – 2013 Research Digest

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Developing Oral Language Ability in the Secondary Spanish Classroom Using the Interpersonal and Presentational Modes of Communication

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June 2013

The need for foreign language competence has never been greater than it is today in our increasingly interdependent global society. In addition to being able to communicate with native speakers of other languages, it is also essential to have a deep and vast understanding of the customs and cultures in which languages are spoken. The American Council on Education (ACE) and the Coalition for International Education (CIE) developed *A 21st Century Imperative*, which promotes the need for global competence, stating "...the United States' future success will rely on the global competence of our people. Global competence must become part of the core mission of education" (American Council on Education [ACE] & the Coalition for International Education [CIE], 2009, par. 1). World languages play a significant role in the preparation of globally competent students, and at the same time, reports show that the United States is not currently placing enough emphasis on language study in grades K-12 (Field, 2009; Klein, Rice, & Levy, 2012; Mansilla & Jackson, 2011). In order to attain the level of competence needed for success in today's multilingual society, students should have the opportunity to develop language ability in grades K-12 that prepares them to communicate with native speakers for many purposes.

Review of Literature

In order for students to gain a high level of ability in languages other than English, it is essential to start early and continue study in an uninterrupted sequence through grade 12. The amount of exposure one has over time to a foreign language correlates directly with the level of proficiency one can attain in that language. Beginning language study in the early grades, therefore, can allow the time needed to gain a high level of communication ability and a deep understanding of the culture, which aids in communication with native speakers of the language (Curtain & Dahlberg, 2008; Glisan, 2012; Lipton, 1998; Wardle, 1992).

As part of the Goals 2000: Educate America Act, the field of foreign language education developed national standards for students in grades K-12 entitled *Standards for Foreign Language Learning: Preparing for the 21st Century* (ACTFL, 1996). The *Standards* are organized in five goal areas known as the “5 Cs”: Communication, Cultures, Connections, Comparisons, and Communities, and they promote the opportunity for students to study a foreign language, beginning in the early grades and continuing through grade 12. The three standards of the Communication Goal include three modes of communication: interpersonal, interpretive, and presentational. The interpersonal mode is characterized by the active negotiation of meaning between two or more people and involves students communicating with one another, via oral or written communication (Swender, 2003). Additionally, because of the prompt nature of questions and responses in conversation, interpersonal communication is spontaneous, meaning that speakers do not plan their dialogue in advance (Adair-Hauck, Glisan, Koda, Sandrock, Swender, 2006). Interpretive communication focuses on the interpretation of meaning that occurs in written and spoken communication without active negotiation of meaning between the speaker and writer, or vice versa (Swender, 2003). The presentational mode of communication is oral or written communication that one creates for an audience without negotiation of meaning between the two parties. This could include for the novice learner writing simple sentences or giving a presentation or speech. In the presentational mode, students experience “one-way” writing or speaking by which the audience cannot interact with the presenter (Swender, 2003).

In 1998, the *ACTFL K-12 Learner Performance Guidelines* were developed as a measurement gauge of students’ development of the content knowledge represented in the national foreign language standards (ACTFL, 1998). The *Performance Guidelines* were aligned with the Proficiency Guidelines according to the proficiency levels of novice, intermediate, and pre-advanced (ACTFL, 1999). At the novice level, students are able to express themselves using highly practiced and memorized language on familiar topics. At the intermediate level, students are able to use a variety of familiar topics, as well as engage in interactions in which they can ask and answer questions. The advanced level builds upon the intermediate level, and at this level, a student is able to express him or herself using both familiar and abstract topics (ACTFL, 1999).

When designing instruction, the use of all three modes of communication helps students gain language ability for use in an authentic classroom environment in which the target language is used exclusively and purposefully by both the teacher and students in order to support students’

progress in proficiency development (Collentine, 2004; Glisan, 2012). In order to provide proficiency-oriented instruction, foreign language teachers must offer many different performance-based activities, which allow students the opportunity use language for authentic communication purposes.

When designing both informal and formal assessments, proficiency-based rubrics are effective in documenting student progress. The assessment criteria should be aligned with the *Performance Guidelines* and support expectations for the stage of language development and types of communication tasks students are carrying out. Through the use of purposefully designed, performance-based instructional and assessment practices, foreign language teachers will be better prepared to facilitate the development of oral language ability in their students. This action research study investigated the use of instructional strategies that focused on the interpersonal and presentational modes of communication to help students develop oral language ability in the secondary Spanish classroom.

Methodology

This action research study included 18 participants in a Level I Spanish classroom in a central North Carolina public high school. The research was conducted from April 8- April 30, 2013. Parents and guardians signed informed consent letters that were sent home with all students; students under the age of 18 signed letters of assent; students over 18 years old signed informed consent letters. Data were collected during normal instructional delivery as part of in-class and homework assignments completed by all students. To protect participants' privacy, the researcher used a coded system and assigned all 18 students a separate letter, A-Z, in order to code each student's data. At the completion of the study, all data materials were stored in a locked file cabinet in the office of the researcher's advisor.

The study generated three data sets about oral language development. The first data set consisted of three types of classroom activities: two interpersonal activities, two presentational activities, and one culminating activity involving both interpersonal and presentational communication. The interpersonal and presentational activities led to a culminating activity in which students were required to create a PowerPoint presentation describing five members of their family, giving each family member's name, stating his or her relation to the student, and describing each family member without the use of notes or text on the slides. This culminating activity required students to use both presentational and interpersonal forms of communication.

The second data set included field notes the researcher made while observing students completing classroom tasks and also in reviewing video recorded instruction throughout the study. The researcher used several checklists and an evaluation rubric to note the accuracy of the students' oral use of Spanish and document their progress. The researcher analyzed the recorded instruction and field notes, focusing on the effectiveness of the researcher's instruction, student engagement, and student participation during language activities. The third data set included student responses to a written survey. The researcher created the survey to learn the students' opinions about the strategies used in instruction that employed the interpersonal and presentational modes of communication and the students' perception of their development of oral language ability in relation to the activities using the two modes.

Results

Seventeen students participated in each of the interpersonal activities and analysis of the data from these activities revealed several common trends. Overall, the majority of the students (16; 94%) delivered a response that was easily understood, meaning that researcher could discern the message conveyed by the student because the student had a response that was mostly accurate in terms of syntax, pronunciation, and overall meaning. A common error at the beginning of the interpersonal activities was for the students to repeat the verb form used by the researcher in their response. As the students engaged in additional dialogue with the researcher, however, the students began to self-correct, distinguishing between the first and second person singular forms of *tener*. By the end of the two interpersonal activities, most students (15; 88%) were able to interpret the researcher's question and provide an accurate response to the question using correct subject/verb agreement and adding additional information such as their family member's name, relation to the student, or years of age.

For the Google Voice activity, the most common error among students was the misuse of the verb *ser*, which means *to be*, in order to describe a family member's age instead of using the verb *tener*, as was practiced in class. Through the students' continued participation in the interpersonal activities, however, by the time the students did the culminating activity and had the opportunity to describe their family members again, twelve students (80%) were able to do so with minimal errors. In total, fifteen students participated in the culminating activity (two students were absent this day). Four of the sixteen students (25%) had an emerging use of basic language structures, meaning that they may have had frequent errors yet were still able to

communicate their message, while the remaining twelve students (75%) had control of basic language structures, meaning that they communicated their message with few language errors. Thirteen students (81%) were also able to use *ser* and *tener* correctly when describing their family members' physical attributes and age respectively, which shows language growth from the first presentational activity in which many students struggled with this concept.

The written survey indicated that overall, the students seemed to enjoy the majority of the activities. Seven students (41%) reported that the activities were interesting, engaging, and helped them learn how to ask oral questions in Spanish. Ten students (59%) said that the activities helped them to speak Spanish on their own; eleven students (65%) said that the activities were enjoyable and helped them speak Spanish with greater ease, and twelve students (71%) reported that the activities helped them to answer questions in Spanish better. At the beginning of the study, many students struggled with the interpersonal activities in almost all of the areas of language growth analyzed by the researcher, including staying in the target language, using the language with ease, and using accurate vocabulary. Yet, at the end of the three activity phases, students were able to move from one-word responses to fuller expression of meaning using complete-sentence responses without prompting from the researcher.

Conclusions

At the beginning of the action research study, the researcher set high expectations for the students with regard to language growth and shared these goals with the students. The researcher planned performance-based activities and lessons so that the students would be provided with focused practice with specific language functions through a meaningful context before being asked to complete tasks that were aligned with proficiency guidelines at the novice level. The results suggest that the use of proficiency-oriented instruction including purposefully designed questions, multiple representations of content, ample time for communication in the target language, and authentic communicative contexts were effective in developing students' oral language ability. Analysis of the field notes and video recordings revealed that the purposeful design of oral questions and activities supported by Second Language Acquisition theory provided students with time to listen to the researcher's modeling of language before creating language on their own. Additionally, the design and implementation of instruction focused on specific linguistic features that were developed using multiple representations, familiar contexts,

and visuals and gestures, along with the amount of time dedicated to the instruction, yielded the positive results seen from the data.

Overall, this study showed the importance of using best practices and research-based instruction and assessment in the classroom as a catalyst for developing oral language ability. Using authentic activities, assessments, and contexts and ensuring students have many opportunities for meaningful communication in the classroom setting may not only increase student participation and engagement, but may also increase oral language ability. As a result of this action research study, the researcher also gained important insight about how to develop students' oral language ability through use of proficiency-oriented instruction. Additionally, the researcher learned how to document student growth over time in order to measure what students can do in the language, how they progress, and how teachers can convey this evidence to students and their parents.

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Problem-Based Learning and Student Attitudes in Mathematics

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In high school mathematics classes, students often ask, “When will I ever use this?” Students ask the question almost in disbelief, as an accusation of the teacher. Students sometimes seem unaware of the deep connections that mathematics has with daily life and other fields. To address this problem, educators are moving away from teaching mathematics as a set of rules and procedures to be followed, instead focusing on conceptual and contextual understanding. Mathematics in the high school is more often a collaborative process, with students working in groups to solve substantive problems, rather than replicating examples from the textbook. Questions remain in the field of mathematics education, however, about how effectively these new methods can change student beliefs about mathematics.

Literature Review

Importance of Beliefs

Why study student beliefs – including self-efficacy, epistemological beliefs, and attitude – about mathematics? As it turns out, self-efficacy has been identified as a predictor of achievement in mathematics (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Mason, 2003; Niehaus, Rudasill, & Allison, 2012). Positive attitude towards mathematics (perceiving mathematics as enjoyable) can affect student use of self-regulatory strategies, as well as predict student beliefs about mathematics (Cleary & Chen, 2009). Epistemological beliefs in turn affect student achievement (Mason, 2003). In short, we study student beliefs and attitudes because they are connected to student achievement and behavior in learning mathematics.

Impact of Problem-Based Learning

PBL has three hallmarks, as outlined by Alessio (2004). First, learning occurs in the context of real-world problems. Second, learning occurs in groups and is reinforced through social interaction. Third, students rely on self-directed learning to explore theory and applications. In PBL, students do not typically receive lecture on a specific topic before they are assigned a problem. Rather, they discover mathematics as they explore a problem in context.

In the sciences, findings concerning student attitudes towards PBL conflict. Some research studies show negative student attitudes (Alessio, 2004; Baseya & Francis, 2011), while others report positive student attitudes (Annerstedt, Garza, Huang-DeVoss, Lindh, & Rydmark, 2010; Liu, Hsieh, Cho, & Schallert, 2006). Others found that PBL could affect self-efficacy (Liu et al., 2006) and interest in STEM material (Lou, Shi, Diez, & Tseng, 2011). Yet others are inconclusive (Wolf & Fraser, 2008).

In mathematics, results suggest that PBL can have a positive impact on student self-efficacy and attitude. Hassi and Laursen (2009) observed positive effects on self-efficacy and attitudes toward mathematics in undergraduate mathematics and education majors. Studies also suggest that PBL can increase mathematics self-efficacy in middle grades students (Bostic & Jacobbe, 2010; Cerezo, 2004). In 2004, Clarke, Breed and Frasier conducted a study on the impact of one specific curriculum featuring PBL on student attitude, epistemological beliefs, and self-efficacy. This study showed positive results in all three types of student beliefs. Because of the structure of the study, it is possible that these results were due to treatments other than PBL.

The current study investigated the impact of PBL on students' relationships with mathematics. It focused on three aspects of these relationships: Students' attitudes toward mathematics, students' self-efficacy in mathematics, and students' beliefs about mathematics.

Methods

The participants in this study were students from the researcher's student teaching classes. The sample consisted of 40 high school students enrolled in Algebra II courses. The participants came from diverse cultural backgrounds. Participants in the study completed, as part of their usual mathematics class, an instructional unit including multiple elements of PBL. During this unit, students frequently worked in small groups to investigate and solve real-world problems. After completing the instructional unit, students completed a survey about their beliefs about mathematics, their attitudes toward mathematics, and their beliefs of competence in mathematics. Data from the multiple choice items on the survey were analyzed quantitatively to measure student attitudes. Data from the open response items on the survey were analyzed qualitatively to determine any themes.

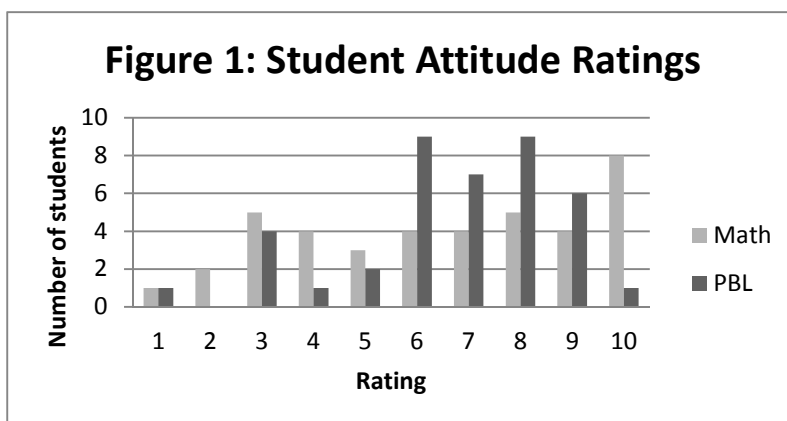
Results

Students in this study reported mixed attitudes towards mathematics. When asked, "How much do you like math?" students responded with an average rating of 6.475 out of 10. When

asked how much they liked PBL, students gave an average rating of 6.65 out of 10. This rating was slightly higher than the rating given to mathematics in general. Additionally, more students had an overall positive view of PBL than had a positive view of mathematics in general. Figure 1 shows a comparison of student ratings of PBL and mathematics.

The majority of students (23 out of 40) also wrote that PBL made them enjoy mathematics more. Students' reasons for this change can be categorized into three main themes. First, students enjoyed working together in a group during PBL. They also enjoyed seeing connections to real life applications of mathematics. Students made comments like, "With problem-based learning, it brings real life situations into play which makes me think more," or, "I enjoy math more with problem-based learning because the problems feel more tangible to me. They are engaging and realistic." Finally, students enjoyed the process of self-teaching during PBL. As one student explained, "it wasn't just a teacher giving me notes and me trying to understanding (sic). I got to teach myself which made it easier for me to remember, because I came up with my own strategies without someone telling me them."

The majority of students (27 out of 40) reported that PBL made them feel more competent in mathematics. Students' explanations revealed three major reasons for this change in self-efficacy. Some students again commented on how PBL helped them see connections to real life problems, which in turn helped them understand more easily. One student said, "It made me feel like I could go out in the real world and solve a problem." Second, students felt that working in groups made them feel more competent in mathematics. As one student explained, "It [PBL] made me feel more competent because I was able to work with a group and show them what I have learned. Also because working with other people helps me understand better. [You] can learn better by your peers." Finally, students wrote about being able to try new strategies to



solve a problem, and that the flexibility in how to approach mathematics made them feel more competent.

Not all students had positive experiences with PBL. Some students (11 out of 40) reported that PBL made them like mathematics less. Students who said that PBL made them feel less competent (10 out of 40) talked about feelings of uncertainty contributing to their low self-efficacy. These students commented that PBL made them feel uncertain about what to do. They also reported that they found PBL difficult, which made them enjoy mathematics less.

In analyzing students' beliefs about mathematics, two major themes emerged. First, students saw mathematics as highly applicable to everyday life outside the classroom. They reported that they engage in mathematics as part of their everyday lives (35 out of 40), and not

Figure 2: Student Beliefs					
Statement	Average Student Rating	Breakdown of Student Ratings (Number of Students)			
		Strongly Disagree (1)	Somewhat Disagree (2)	Somewhat Agree (3)	Strongly Agree (4)
Mathematics is not really useful except for people who have specific jobs.	1.925	14	17	7	2
The ideas of mathematics developed over time because people needed them in everyday life.	3.15	1	3	25	11
Mathematics is something I do as a part of my everyday life.	3.175	2	3	21	14
Mathematics is something I only do at school.	1.675	19	16	4	1
There are usually multiple ways to do a mathematics problem correctly.	3.5	0	1	18	21
There is only one correct way to do a mathematics problem correctly.	1.65	17	20	3	0
Solving mathematical problems requires understanding different strategies to try.	3.575	0	0	17	23

just at school (35 out of 40). The second theme was the belief that mathematics problems can be solved in multiple ways. All students except one agreed with the statement, “There are usually multiple ways to do a mathematics problem correctly.” Similarly, only three students agreed with the statement, “There is only one correct way to do a mathematics problem correctly.” Every student in the study agreed with the statement that, “Solving mathematical problems requires understanding different strategies to try.” These responses showed a clear belief that mathematical problems can be approached using different strategies, and that two different strategies could both lead to a correct answer. Figure 2 shows a breakdown of student beliefs by statement.

When asked whether problem-based learning changed how they viewed mathematics, students were about evenly split, with 19 saying that PBL changed how they viewed mathematics and 20 saying that it did not.

Discussion

The results of this study, which are consistent with existing literature on PBL’s effects on student attitudes, suggest that students may benefit from teachers incorporating more PBL into high school mathematics courses. Allowing students to engage collaboratively with contextualized problems in a self-directed atmosphere may improve student attitudes towards mathematics. Likewise, students who participate in mathematics through PBL may feel more successful in mathematics.

Limitations to this study should be kept in mind when considering its findings. First, participants in this study were selected by convenience sampling from the researcher’s student teaching classes. The study included no control group and no pre-survey, and results relied on student self-reporting. Further research is suggested to confirm or dismiss its results.

The results of this study raise possibilities for further areas of research. In this study, what students liked about PBL aligned with their reported beliefs about mathematics. Did PBL change their beliefs about mathematics, or did students like PBL because it aligned with the beliefs they already held? Some students described feeling uncertain and unsuccessful when participating in PBL, which made them like mathematics less. Is there a way to adapt PBL so that fewer students have negative feelings towards it, and more students receive the benefit of a more positive attitude towards mathematics?

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“Grammar-Drama”: An Exploration of Teaching Grammar through Performing Arts

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June 2013

In the race for effective education in the 21st century where pedagogy is shifting towards student-centered lessons, technology is becoming more prevalent in classrooms, and standards are more defined, some English teachers are still teaching grammar using *old school* styles. But how can students meet today’s curriculum standards when their teachers are using archaic teaching methods? Traditional methods of teaching grammar are becoming outdated, and these methods may ultimately hurt student growth and learning (Dean, 2011).

Some teachers may overlook grammar much in the same way they slant dramatic arts. Seen as an extra-curricular, secondary to the core subjects and sometimes secondary to even other electives, drama holds no real grounds in classrooms outside of English (Milner, Milner, Mitchell, 2012). Even within the English classroom, teachers render the genre of drama as a collection of old, long, elevated *texts* that everyone should *read*. However, educational literature has put forth another idea: drama should take center stage because its pedagogy has a positive effect on students when integrated into everyday practice (Milner et al., 2012; Shirley, 2000).

This study aims to bridge the gap between the teaching of grammar as a craft and the integration of drama pedagogy by presenting the idea of teaching grammar through the performing arts. The purpose of this research is to explore the teaching of grammar concepts and language usage through oral composition and physical movement. This study is conducted around one central question: How can teaching grammar through performing arts affect students' appreciation of language? Appreciation is used here to mean understanding the value of language, or the recognition of how language is used in today’s society.

Literature Review

Grammar

One of the biggest concerns with grammar in the classroom comes first from teachers and their attitudes about teaching grammar. In some cases, if not required, teachers would not include

grammar in their lesson plans because teaching grammar can prove very difficult and because teachers do not feel prepared to teach the subject matter (Dean, 2001). This calls into question the purpose of grammar education. Despite knowing the importance of teaching grammar, teachers still shy away from incorporating it into the curriculum for a multitude of reasons, including that grammar instruction may be worthless (Vavra, 1996), it takes away valuable in-class time (Nunan, 2005), and it is confusing to know which aspects of grammar to teach (Anderson, 2005).

Although there is limited research of the problems and solutions with effectively teaching grammar, one possible remedy is the idea of craft and play. When students can, in a manner of speaking, *get their hands dirty* and really learn to use language to convey the meanings they so wish to project, they will begin to learn and remember grammar. Dean (2001) used the technique of sentence imitation as a form of play. Instead of bringing up parts of sentences and grammatical terms in her classroom, she had her students write two or three sentences in a similar fashion to the one on the board. In this way, students were using these imitation activities to work with the language, discover different ways to say the same thing, and create more effective sentence structures without having to learn the terminology behind them (Dean, 2001). Research also suggests that the traditional teaching methods of grammar are not empowering to students, whereas exploration would allow students to have greater contextualization (Liu 2011).

Drama

The Arts within school walls have often been in competition with the STEM subjects—science, technology, engineering, and mathematics. Drama, in particular, regularly receives the short end of the stick even within the English classroom. It is understandable that in the 21st century, students' minds are on the next latest gadget and not on a performance of Macbeth. Yet, the idea that drama should be experienced is not the only reason to have drama integrated into the classroom. Theater can present valuable information on periods in history, pair with other literature for better understanding, and reflect many themes in science and human nature (Martin, 1998). In this sense, drama is a medium that conveys universal experiences that can greatly broaden a student's perspective. The connection that students make with the performing arts allows students to gain a sense of ownership of the content. No longer is Shakespeare in control of his own plays—now students who dread the sound of *thou* or the scansion of iambic pentameter can have a say in how the same meaning is conveyed in different manners and even

in different words. By its very nature, drama is a social event that evokes conversation, which can help students feel relaxed, improve focus and concentration, increase confidence, and provide opportunities for teamwork (Darlington, 2010). Furthermore, integration of the performing arts allows students to have hands-on experiences and, at the same time, allows teachers more room for creativity when creating their lesson plans (Martin 1998).

Grammar-Drama centers on the intersection between language, culture, and identity. This study's central focus is to help students invent their own context to explore grammar, understand and utilize the power of language, and share their investigation through performance. By incorporating drama pedagogy into common grammar lessons, students will explore not only their skills as public speakers but also explore their skills as 21st century communicators.

Methodology

Setting and Participants

The study took place in the researcher's student teaching placement in a secondary English classroom in a North Carolina public high school. The classroom was a tenth grade honors English class, with a sample size consisting of sixteen students. This study was relevant to the tenth grade curriculum as it requires students to engage with learning grammar, stylistics, and language usage. Participation in the following general activities was a requirement of the course; participation in this study, however, was strictly voluntary.

Data Collection Methods

Students in this study learned language and grammar concepts using the dramatic arts, meaning they learned language and grammar through their own creations and through performance in skits and exercises. The study comprised of a pre-instruction survey that identified students' prior experience and feelings towards grammatical concepts as well as their attitudes toward dramatic performance. The pre-instruction survey consisted of thirteen Likert scale questions with four options: Disagree, Mostly Disagree, Mostly Agree, and Agree. The survey addressed students' original perceptions and experiences (e.g., Do you enjoy doing grammar exercises?). Students' perceptions were determined before the unit and then after the unit. The perception difference was a factor in determining students' appreciation of grammar.

Students received lessons on language or grammar concepts that included examples followed by a drama activity in which they created and presented their completed product to the whole class. This product took the form of an acting skit and/or a vocal skit with a focus on

language, stylistics, and grammar. These activities took place throughout the semester. After each activity, students completed an activity response in which they reflected on what they learned and what they saw. There were five different activities presented throughout the semester: (1) The Art of Argument, (2) Passive and Active Voice, (3) Tone and Diction, (4) Improvisation Figurative Language Story, (5) Figurative Language Haiku.

Data was collected from the surveys and activity responses and analyzed through a three step coding method. Through open coding, the process by which the researcher first examines the collected data, 31 initial codes, or categories, were discovered. These codes were created from looking at the first two short answer questions on the post-survey. Next, axial codes were selected from combinations of previous codes. The original codes were condensed, combined, and reworded in order to cover a broader range of topics. Lastly, themes that were the most pertinent and prominent in relation to the research question were selected through selective coding.

Results

This research focused on how teaching grammar concepts through performing arts can affect students' appreciation of language. Six themes emerged from the data: presenting and sharing information orally; creative and hands-on practice; group work; movement; observation; and writing compositions. It is important to note that not all of these themes affected students' appreciation of language positively as some themes had both a positive and a negative impact. For example, writing and presenting were themes in which student opinions seemed to vary due to their learning style or learning preferences. Group work and movement got students excited about what they were learning, but observation helped students create better performances. Overall, students were more engaged when they were able to be active and creative.

During data collection, the emerging themes demonstrated that students appreciate language when they have creative, hands-on practice with the grammar or language concept. Having a hands-on approach allowed students to be creative and explore language through their own curiosities. This is reminiscent of Dean (2001), who used sentence imitation as a way of craft and play so that students were learning grammar without knowing they were actually learning. In a similar sense, the students began to look at each other's performances as examples to imitate. Yet, understanding the concept and why the concept is important to study was just as important as playing with the concept.

The researcher found, not surprisingly, that students were more engaged with the lesson and more excited about learning grammar when they were actively involved. This idea of probing language through active engagement can be found in Liu's (2011) study in which grammar was taught through the exploration of language. In the present study, students expressed a desire for activity in their open-ended responses. For example, one student said, "I enjoyed being hands-on and creative because it helped me to understand more [about language]. PowerPoints and taking notes is just a boring way of learning it and you're more focused on getting the notes down than you are trying to understand it." Not only does this creative component of teaching get students to appreciate learning language, but it also helps students understand what they are learning.

Discussion

Among the themes explored in this study, it was determined that most students believed learning about language and grammar does have a distinct purpose. Although not all students enjoyed the physical acts of presenting and writing, findings suggest that students recognize the need for and the use of language in today's society. The use of drama pedagogies enabled students to gain a better understanding of the value of language, regardless of its written or oral properties.

This study was intended to get students to be actively engaged with oral language, to help students appreciate the power of language, and to experience language through movement, manipulation, and writing. However, the biggest gap located during the study was between oral and written language. The question that emerges is how does oral language affect written language and vice versa? Although the activities had elements of both written and oral language, they were not the focus of this study, and therefore it is not clear how possible connections or disconnections affect student appreciation of language. Thus, it is important to consider expanding this study to move past the mere appreciation of language and how students *felt* about learning language.

In today's classrooms, more teachers should consider incorporating drama teaching methods throughout their classes. Although this is not the easiest method of planning or teaching, this study has revealed that movement, oral composition, and group work can help students become more engaged in content and help the class become more learner-centered. In today's rapidly changing world, the skills learned through drama-integrated lessons, whether related to

grammar or not, expand beyond an appreciation of the subject at hand towards a greater appreciation for learning.

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Mining for Gold on the Silver Screen: Using Film to Develop Active Literacy Skills

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Film has been among the most popular media for the last century; practically every high school student has grown up watching movies, but not every high school student is film literate. Movies, like books, are created by casts of people with specific goals, methods, and interests. Unlike books, movies fuse visual, kinesthetic action with sound to create a uniquely engaging literary form.

Barton and Hamilton (2000) argue that literacy is a social practice: that various literacies exist within various domains of life, and that literacy practices are fluid and contextual. Based on this social theory of literacy, a wide range of media, such as film, can be viewed and analyzed as literature. Skerrett and Bomer (2011) reinforce the concept of multiple literacies, encouraging teachers to incorporate students' out-of-school literacies into their curriculum. Vetrie (2004) points to the usefulness of popular film, specifically in the high school English classroom.

Studying film can improve students' critical thinking, reading, and writing skills. It can also keep students engaged by bridging school and out-of-school knowledge. In addition, movies generally elicit greater interest and emotional response from students than do print texts (Bell-Metereau, 1983). If students are to become thoughtful, literate, critical viewers of the film texts that pervade their lives, then they should be familiarized with the language and conventions of the cinematic form. Film ought to occupy a more significant role in the secondary English curriculum, and, as suggested by Muller (2006), it ought to be taught *as film*.

The purpose of this study is to create a strategy for engaging and developing active literacy skills in high school English students through the study of film *as film*. These literacy skills involve analytic and critical thinking as well as the ability to communicate effectively while discussing film in a way that demonstrates understanding of its conventions, techniques, and literary elements. The primary research question for this study is as follows: How can film

be taught in the secondary English classroom so that it fosters active literacy skills in students? It was with this question in mind that the research methodology was designed and implemented.

Literature Review

Literacy was once defined as the ability to read, comprehend, and interpret print texts (Buschman, 2009). However, this clear and concise definition of literacy ultimately fails to account for cultural influences: specifically, the myriad digital and audiovisual media that have become such an integral part of today's world. Researchers in sociolinguistics have outlined a social theory of literacy in which literacy is understood as a social practice (Barton & Hamilton, 2000; Street, 2005). According to this theoretical viewpoint, different literacies exist within different domains of life. Literacy practices are not static, but fluid and contextual, and can be acquired in formal and informal settings, including both home and school.

Film, like print texts, lends itself to analysis and can help strengthen critical thinking (Golden, 2001; Krueger, 2001; Vetrie, 2004). However, film requires a different reading approach. Film analysis is neither superior nor inferior to print text analysis, but it may keep students more engaged. There are some who complain that analyzing film detracts from the viewers' raw enjoyment and appreciation of the medium, but Boggs and Petrie (2006) insist that analysis, so long as it does not totally eradicate the viewer's subjective emotional response, is necessary for gaining a fuller appreciation for the filmic art form. The same concept applies to print literature. Before analysis can take place, it is necessary for students to be aware of and attempt to put aside their existing biases and prejudices (Boggs & Petrie, 2006). Donning a critical cap, they place themselves in a position to participate in a richer, fuller viewing experience. After analyzing the cinematic text, they can connect and compare it to the world around them.

Boggs and Petrie (2006) also note that film often requires multiple viewings; so many things take place so quickly that a single viewing does not afford the viewer enough time to complete a full analysis. The first viewing typically allows for a simple analysis of plot, emotional effect, and thematic content, while the second viewing allows students to pay special attention to cinematic techniques. Teasley and Wilder (1997) recommend the use of a viewing rubric to aid students in this multilevel analysis. The rubric guides students to look for specific, important features of the film, and offers students a graphic means of organizing their analysis and jotting down observations they might otherwise forget.

Beyond critical thinking, film can be used to foster critical literacy in students, which is aimed at identifying and deconstructing systems of power; Wood et al. (2006) identify the goal of critical literacy as critical and social consciousness. Morrell (2005) advocates for a critical English education that “is explicit about the role of language and literacy in conveying meaning and in promoting or disrupting existing power relations” (p. 313). He insists that English teachers must be activists: that they must equip students with the diverse literacy skills necessary to analyze dominant narratives and media texts, such as film, and write their own texts, becoming agents of social justice. By incorporating a classroom model wherein students are asked to view and respond to film, these critical and analytic skills may be developed more fully.

Methodology

During the course of the study, students viewed, analyzed, and discussed one film over the course of four days. The researcher chose the film *Defiance*, a recent release with contemporary popular appeal, since the study took place during a larger unit on the Holocaust. As the five-day unit progressed, the teacher worked to provide students with a growing knowledge and understanding of film, including a vocabulary of filmic elements, styles, and conventions.

The study subjects were composed of the high school students in the teacher-researcher’s English II Honors class. Student participation in the research study was entirely voluntary, and all students were given the opportunity to participate. The number of participants was twenty-two, sixteen of whom were male and six of whom were female. The class consisted of thirteen white students, eight black students, and one Egyptian-American student. Students possessed a wide range learning styles and ability levels.

Data collection took place over the course of students’ normal classroom experiences. First, all students participating in the study were asked to complete a survey. The survey addressed the students’ familiarity with and understanding of film as well as their attitudes towards film. Second, students were asked to complete two identical observation protocol sheets: one after viewing the first film clip, and another after viewing the final film clip. The first day, the researcher screened the first twenty-five minutes of the film prior to offering any instruction. Students were told to look over the questions on their observation protocols before watching the film clip and were given ten minutes to complete their handouts when the segment had finished. Once participants had finished their first observation protocols, the researcher facilitated a class

discussion in which students talked about their responses to the observation protocol questions. After the discussion, the researcher screened the same segment a second time. During the second viewing, the researcher paused the film frequently to point out certain filmic techniques and conventions, beginning to provide students with a rudimentary filmic vocabulary. The researcher also encouraged students to start thinking about the purposefulness of film: *why* the director had chosen these techniques, and why they were effective (or ineffective).

The researcher continued this method of viewing and re-viewing half hour segments on Day 2 and Day 3. However, as the unit progressed, the researcher began to pose more questions to the participants during the re-viewing portion of class. In this manner, it was the students, not the instructor, who became responsible for pointing out what techniques they were seeing on-screen. Viewing and re-viewing the film segments allowed students to have more of a “raw” experience with the film before diving into thorough analysis. Additionally, the two protocol sheets operated as a kind of pre- and post-test, allowing the researcher to see how responses reflected changes and developments in thought, analysis, and expression. Responses were assessed by the researcher to evaluate any change or growth in students’ literacy skills.

Third, students were divided into small groups of four or five on day four to complete a moviemaking activity. The activity asked students to choose a plotline for a fictional narrative film about the Holocaust, consider actors to play the major roles, write a script for the narrative, and sketch a storyboard for two important scenes from the film. The key component of the activity was the storyboard: after writing their scripts, each group was asked to create a six-frame storyboard for the two scenes. In order to create the storyboard, the students had to decide how certain shots should be framed and which camera angles would be most effective. The moviemaking activity was devised to give students an opportunity to put their newfound filmic knowledge to use and consider film collaboratively and creatively. The researcher used this data to evaluate whether students understood the material enough to create a piece of their own.

Finally, all students participating in the study were asked to keep a weekly learning log in which they wrote their thoughts and reflections on what they had learned that week about film. The role of the participants was to actively reflect on their learning and to describe the filmic terms, styles, techniques, and conventions they had discovered. The learning log allowed the researcher to assess whether or not students were learning to speak about film with a more extensive vocabulary and comprehensive understanding.

The researcher coded and analyzed written responses based on constant comparative analysis (Corbin & Strauss, 1990) in order to determine the effect of instruction on students' active literary skills. The use of constant comparative analysis and layered coding techniques enabled the researcher to reach reliable conclusions based on the available data. Several validation strategies were utilized to help ensure trustworthiness: prolonged engagement, triangulation of methods, peer review, researcher positionality, and thick description.

Findings and Discussion

The following themes emerged from the researcher's constant comparative analysis: attitudes towards film, use of filmic vocabulary and recognition of techniques, and understanding purpose. Student attitudes towards film emerged primarily from responses to the survey and were generally positive. Students showed preferences for certain genres of film, such as action and comedy, and they discussed their views on how film should be used in class. The second theme centered on the students' development of a filmic vocabulary over the course of the study as well as their ability to recognize and analyze the filmic techniques and conventions to which they had been introduced. The third theme, understanding purpose, focused on students' ability not only to recognize filmic techniques but also to demonstrate understanding of each technique's purpose.

The most notable theme to emerge from the observation protocols was an increase in the use of filmic terms, techniques, and vocabulary, which had been established as the intent by the researcher. In their responses to the first observation protocol handout, students did not use a domain-specific vocabulary to describe what they were seeing on-screen. In their second set of responses, there was a dramatic increase of domain-specific vocabulary; students demonstrated that they learned to identify a variety of filmic techniques and conventions, and, as a result, they began to sound more "film literate."

The researcher found that students made greater strides in analysis than in critical literacy. The film interested students, which meant that they were engaged from the beginning. They participated in discussion, writing, and active viewing. Their filmic vocabulary improved, which in turn led to increasingly film literate speech, writing, and verbal communication. Their depth of analysis and understanding of authorial intent showed signs of improvement, though these analytic skills did not show as much growth as their vocabulary. Most students did not reach a higher level of critical literacy, but they did show an increase in overall literacy skills: analytic

thinking, effective communication, and comprehension of film's conventions, techniques, and literary elements.

Film taught *as film* can develop active literacy skills in students, but it must be taught for an extended period of time if it is to foster both analytic and critical literacy. Film deserves a central role in the secondary English classroom because it is engaging and relevant to students' lives. This is not to say that film should usurp the place of printed texts but that students' interests should be acknowledged and accommodated to some degree. Teachers have a responsibility to make their students literate thinkers in the world that surrounds them. With this in mind, it is imperative that English educators consider film as one essential component of the secondary English curriculum.

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Influences of Reflective Writing in High School Biology

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June 2013

The purpose of this study is to investigate the impact of reflective writing on student achievement and self-efficacy of high school biology students. Writing is important across all content areas and should be incorporated into science classes to help students become complete and global thinkers. It is important for the students to learn as much as possible and to embrace and investigate scientific concepts; incorporating reflective writing into the science classroom is an effective way to encourage this activity.

Teachers should inherently value student feedback. Most teachers want to know if the students are comprehending information thoroughly and if students are confused about any material. Reflective writing can help a teacher get a view into their own students' thought processes (Levin & Wagner, 2006). If the reflections are unclear or connections are not made, teachers can use this feedback to address student issues and reinforce important information. A study by Towndrow and Ling (2008) showed that reflective writing helped teachers see student confusion and address this confusion. Furthermore, reflective writing can keep an educator's teaching in check. This form of expression can help the teacher assess how well that person is presenting information, and whether or not the students retain what they have learned. If teachers can see exactly where students have trouble connecting the material, they can better help them make connections and understand the content.

Teachers have long been incorporating writing into their classrooms for various purposes. However, in science classes, writing was often defined as copying notes, answering questions, and producing lab reports or summaries of information (Bangert-Drowns, Hurley, & Wilkinson, 2004, p. 31). These prompts for writing have not inspired higher-level or critical thinking, as they are simply asking for regurgitation of information. While students spend much time copying notes and information from teachers and/or textbooks as well as providing answers to questions from notes they do not understand, this copy-paste mentality is often passed off as

writing. Many individuals, such as Applebee (1984), believe that simply implementing this form of writing in the classroom will not increase student understanding or achievement. Mere “writing” will not have a positive influence on students. However, reflective writing can stimulate the mind, pull from prior knowledge to scaffold information, foster creativity, challenge students, and help develop critical thought processes. Ultimately, reflective writing could be a way of writing that improves student knowledge and achievement. This study seeks to answer the question: How can reflective writing influence students’ comprehension and self-efficacy in high school biology?

Methodology

Participants

The participants in this study are from the author’s student teaching internship in the Spring of 2013 from a suburban high school in the southeast United States. The forty participants were students that were enrolled in a biology class. Approximately half of the students were male and half of the students were female. The majority of the students participating in this study were high school freshmen and sophomores.

Materials

The materials used in this study include pre-/post-tests, surveys, and student interviews. The survey and interview questions were pre-assessed for clarity, consistency, and appropriateness using a pilot group at Wake Forest University. All of the students participating in the study took the pre-test and post-test as well as the open-ended survey. Of the students participating in the study, three students were randomly chosen for the student interviews. The students’ identities have been rendered anonymous throughout all of the assessments, including the surveys and interviews.

Design

This study was a mixed method action research study, meaning that it was comprised of qualitative and quantitative analysis. Qualitative analysis usually encompasses observations and descriptions, while quantitative analysis is comprised of numbers and statistical data. This study focused on student achievement, which was measured by the means of the pre-test and post-test. These means included the quantitative data, which was analyzed to determine whether or not there was a significant difference in the pre-/post-test findings. The qualitative data was measured through the use of student responses on the surveys and interviews.

Procedure

This study examined the effects of reflective writing on students' achievement and self-efficacy in high school biology classes. An experimental group experienced reflective writing each day, which was compared to a control group that was not involved in writing exercises. This study took place over the duration of a genetics unit. Students had the opportunity to agree to participate or the freedom to decline to participate. Towards the end of the block/period during each day of the unit, the students spent five to ten minutes working on a reflective writing assignment. These reflective writing assignments ranged from creating metaphors for concepts learned in class to writing a letter, in ten sentences or less, to a middle school student summarizing what was learned to illustrating a learned concept with captions.

These reflective writing assignments were used as a ticket out the door for students, meaning they were collected as students left the class. Before instruction was provided about the unit taught in this study, a pre-test was given to the students in both the experimental and control groups. The surveys were handed out to the students before the post-test was administered. When the unit and all of the reflective writing assignments were completed, a post-test was administered. Towards the end of the unit, three students were randomly selected to be interviewed out of the participating students. These students were interviewed individually and each interview lasted approximately five to ten minutes.

Results

The average score on the control group's pre-test was a seventy percent and the average score for the experimental group's pre-test was a seventy-two percent. The two pre-test scores were very close and the difference was not significant. After the unit was over, the students in each class took the post-test. The average post-test score for the control group was 85% and the average for the experimental group was 87%. The differences between the two groups were not significant. The experimental group also participated in the survey at the end of the unit. When analyzing the surveys, four primary themes arose: the reflections were helpful with concept understanding; they were helpful with remembering and recall; the reflections were not helpful at all; and the reflections were helpful to others.

In the survey given to the experimental group at the end of the unit, the students were asked how their confidence using reflective writing compared to confidence in material covered before the reflections. The students rated their level of confidence with one being very

unconfident, two as being somewhat unconfident, three as being somewhat confident, and four being very confident. Thirteen of the 24 students who took the survey indicated that they felt somewhat more confident with the reflective writing than they did in units without reflective writing. Six students indicated that the reflective assignments made them feel very confident compared to the units without reflective assignments. Six students still felt somewhat unconfident utilizing these reflections.

Discussion

The quantitative data collected in this study was not statistically significant, however, the qualitative data showed evidence that reflective writing, if implemented correctly, could be helpful for students' comprehension and self-efficacy. Thirteen of the 24 students surveyed indicated that the reflective writing assignments were generally helpful in some way. Some students said that the reflections helped with remembering and recalling information and understanding concepts more in depth.

Also, over half of the class (79%) indicated they felt somewhat confident to very confident about the material when the reflective assignments were part of the class. The reflective assignments helped many students understand and grasp the material covered in the class. Students who have a thorough understanding of a concept generally feel more confident. Therefore, for many students, their grasp of knowledge through the aid of the reflective writing assignments contributed to increased self-efficacy.

There are several limitations to this study, including participation biases and sample size. Also, the sample was not very diverse. Both classes that participated were honors biology classes, which did not provide a diverse group of learning differences and learning styles. The classes themselves were also not very diverse in background and ethnicity.

Despite these limitations, teachers could still implement reflective writing in their future classes, although there are a few aspects of the assignments that could be changed. Many of the students said they felt that they did not have enough time for the reflective assignments, which means that in the future, teachers could plan to give the students between 10-15 minutes to write the reflections. Students also said they wished the reflections had been given back to the students before the tests so they could have looked over them and used them to study for the test. One option is to have students keep composition books for their reflections in the future and to have them stored in the classroom. That way, students will have access to their reflections at all

times. It is also desirable to use the reflective assignments over the entire semester, not just during one unit.

Overall, the reflective writing assignments were more helpful than not. Through further research using reflective writing in science, evidence will become clearer and can lend more clues to how reflective writing can be implemented and assignments can be helpful for students.

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Multicultural Perspective Taking in Social Studies Education

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The National Council for the Social Studies (2012) defines social studies as “the integrated study of the social sciences and humanities to promote civic competence” (online). NCSS goes on to mention that the goal of social studies is “the promotion of civic competence - the knowledge, intellectual processes, and democratic dispositions required of students to be active and engaged participants in public life” (National Council for the Social Studies). While these goals and definition set forth by NCSS are clear-cut and well-defined, studies demonstrate that students still are falling short in their achievement within the social studies classroom (Gaudelli, 2002). The results of a 2002 National Assessment of Educational Progress study that assessed fourth, eighth and twelfth grade students in United States history, are discussed in Gaudelli’s 2002 article, “U.S. Kids Don’t Know U.S. History: The NAEP Study, Perspectives, and Presuppositions.” The study found that sixty percent of high school seniors that were assessed failed in demonstrating basic knowledge of United States history (Gaudelli, 2002).

Gaudelli (2002) examines the study and reasons behind why students continue to perform poorly by looking through the lens of four different perspectives in social studies; perennialism, essentialism, constructivism, and multiculturalism. A significant point that Gaudelli (2002) makes is that these test results might reveal how more attempts need to be made to diversify the United States history curriculum in order for it to accurately reflect the populations that are currently present in schools (Gaudelli, 2002).

Literature Review

Social studies education not only teaches concepts associated with citizenship, but presents a national story that emphasizes key elements like equality, social justice, and citizenship responsibility (Chandler & McKnight, 2009). The perspective of this national story, however, is dependent upon certain factors such as who the person is that is telling the story; who is included and excluded in the process of telling the story; who is the person that is shaping

the plot of the story; and who is directly or indirectly in charge of interpreting the story (Chandler & McKnight, 2009). Oftentimes, marginalized groups that are considered minorities and contradict dominant white culture are presented as posing a threat against narratives that are deemed as being truly American and are as a result fought against (Chandler & McKnight, 2009).

This highlights the need for the curriculum of social studies education to make students aware of the presence of inequality in social, political or economic realms and how it has been an enduring struggle throughout the history in the United States. Students also need to be informed that this struggle was comprised of the significant contributions from a diverse group of Americans such as men and women from all types of racial and ethnic backgrounds (Willis, 1996). This can be accomplished through increasing the narrative of United States history to include traditional historical events with groups and individuals who have been formerly omitted (Willis, 1996). Also, by including new events that emphasize the role of people that have been typically ignored will lead to students gaining a more thorough understanding of historical events and people as well as a more diverse narrative of American history (Willis, 1996).

A constant challenge for social studies teachers in multicultural nation-states is being able to simultaneously respect and identify the varying culture and knowledge of students while creating a democratic community with a common set of values that all students can relate to and feel some sort of obligation (Banks & Diem, 2008). It is important to affirm the identities of students from diverse backgrounds, but diverse groups must also feel as though they can maintain their culture and feel allegiance to their nation (Banks & Diem, 2008). This concept points to the importance of the roles of diversity and unity in relation to multiculturalism and social studies education (Banks and Diem, 2008).

Methodology

This study strived to analyze the benefits of using a multicultural perspective taking approach in a high school social studies classroom through the mediums of primary sources such as historical narratives and images. This study focused on examining the question of whether the use of primary sources like narratives and images from multicultural perspectives influence the way that students view history and its effects on the present. In order to answer this question this study utilized an action research methodology. The goal of this study was to see whether the introduction of these elements into social studies educational curriculum aided in improving

student's historical understanding, multicultural perspective taking and the development of civic competency necessary for students to become engaged members of society as outlined by the National Council for the Social Studies. The participants in this study were adolescent (individuals from age 12-17) and adult (individuals from age 18-44) students in two of the researcher's social studies courses.

The first section of this study consisted of students filling out a ten question pre-instruction survey that assessed their initial perspectives on history, culture of the United States, minority culture and other cultures that are different than their own before having any formal instruction from the teacher. The questions were in the form of open-ended questions and questions that ask students to rank items on a Likert scale. This information was used to evaluate what multicultural primary sources the teacher used throughout the semester to introduce students to varying multicultural perspectives that they may have never considered due to lack of knowledge or reluctance to engage with perspectives that are different than their own.

These data were analyzed using descriptive statistics, which can be described as using data analysis techniques that allow pieces of data to be examined in a meaningful fashion with numerical indices (Gay et al., 2012). Descriptive statistics were used to evaluate reoccurring themes in student work. The data in the form of student work, observations and information from the survey in the form of questions that are ranked using a Likert scale and open-ended questions were collected using Spradley's Descriptive Question Matrix (Spradley, 1980). All open-ended questions were explored using the grounded theory, which demonstrated how the theory in this study was grounded in data at this particular student-teaching setting (Gay et al., 2012). The use of the grounded theory method when examining data allowed the theory to emerge from the data (Strauss & Corbin, 2008). The insight collected from students in the form of student responses on pre-instructional surveys, post-instructional surveys, class assignments and discussions aided in culminating the results of this study. The results were rooted in the idea that student experience played a more dominate role than cultural background in multicultural perspective taking, which emerged during the data collection process.

This study involved students completing assignments throughout the semester in their particular social studies class such as writing projects, group projects, class work and homework assignments that caused students to use primary sources and examine perspectives of minority groups in various historical situations. A comparison was performed between varying classes

that received different treatments of primary sources. This study consisted of a quasi-experimental design that used a counterbalanced design. The counterbalanced design for this study made it possible for all groups of students to receive all treatments, but in a different order throughout the unit (Gay et al., 2012).

The last section of this study involved students filling out the same pre-instruction survey from the beginning of the semester as a post-instruction survey. This survey was used to compare changes in student perspectives after taking this course.

Results

Pre-Instructional Survey and Post-Instructional Survey

A way that multicultural perspective taking in a social studies classroom can be evaluated is through the use of the pre-instructional and post-instructional surveys that were given to students before and after instruction in their United States history classes. Students were given Likert scale surveys that ranged in responses that included strongly agree, agree, disagree, strongly disagree and not applicable. An example of the types of questions that students were given to respond to on the Likert scale pre-instructional and post-instructional surveys were statements like whether students felt like their culture, race and gender, etc. were accurately represented in history. These surveys provided direct insight into the opinions of students in terms of how they see themselves and others in United States history.

Observations

In terms of activities that focused on introducing students to varying perspectives of different groups the Reconstruction Era lesson plan on hate groups like the KKK and the New Black Panther Party showed how it is often difficult for students to separate their own personal experiences from the experiences of others. It is also challenging for students to be able to understand or empathize with the different people. Written student responses, class work assignments and class discussions revealed students' strong opinions about multicultural perspectives and demonstrated how student responses were more linked to individual experiences than a student's gender or cultural background.

Discussion/ Conclusions

While the implementation of a multicultural perspective taking approach through the use of tools like primary sources gave students insight into historical events and struggles of different cultural groups in the past it was often difficult for students to understand the perspectives of

these groups. The one overarching constraint that prevented students from seeing the perspectives of others was their inability to examine situations apart from their own experiences. Many students only allowed their personal experiences to shape their reality and this prevented them from comprehending how various people in the past and present make decisions that may not follow their own ways of thinking. Regardless of the students' gender or race they relied primarily on their own life occurrences to analyze historical events and figures and the possibilities for change in the future. On the opposite end of the spectrum there were students that chose to not engage with multicultural perspective taking because they did not feel that it was valuable to examine the challenges faced by minority groups in a diverse society or they were too apathetic towards this topic. Nevertheless, students still gained exposure to various historical events, cultural practices, minority struggles and different ways of thinking.

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Using Primary Sources to Evoke Historical Empathy

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The National Council for the Social Studies (2012) values the implementation of media literacy within the social studies curriculum as a means of teaching students how to use diverse forms of media and information technology to question, analyze, and integrate literacy skills to engage in critical thinking. This is illustrated through the NCSS's 2012 position statement which declares the following: "in the twenty-first century, participatory media education and civic education are inextricable" (online). This means that social studies education must be intertwined with not only teaching students how to be active citizens but also how to understand the numerous implications for media within our society.

Particularly, NCSS's curriculum standards emphasize the improvement of media literacy skills through the student's practice with and use of different types of sources. For instance, NCSS states that the promotion of media literacy through the use of "diverse types of media and information communication technology (from crayons to webcams)" to analyze media and its roles in society (NCSS, 2012). Essentially, students should possess the skill of being able to distinguish between different sources to demonstrate their understanding of the roles of media and its implications for the students in the future. In general, NCSS recognizes media literacy as a vital skill needed for the development of students into democratic citizens who participate in society by critically questioning information and media that they use, hear, see and encounter on a daily basis. Overall, the NCSS strives to promote the creation of a curriculum in which media literacy awareness produces students who are informed decision makers and influence democracy for the public good (NCSS, 2012).

Literature Review

The crucial component of reading and interpreting historical texts remains a pertinent matter within social studies classrooms. Specifically, it affects the types of instruction that educators design and sources that they select to use within their teaching. In regards to the student, historical texts have the ability to foster historical thinking and historical understanding.

Moreover, the use of historical texts such as primary sources has given both teachers and students a unique way of developing a historical subtext of the time period that is being studied and to create a deeper understanding of the events and the various societal factors affecting individuals detailed in the primary source. A primary source is a firsthand account of historical events that can come in various forms and are used to provide individuals with a snapshot of a certain perspective during a specific time period (Poulton, 1972). It is an understanding of the subtext that separates students from historians (Wineburg, 1991).

Primary source use within classrooms serves different functions for students and teachers. Students' use of these sources is typically organized around the intention of creating an enhanced knowledge of historical content (Salinas, Bellows, & Liaw, 2011). Basically, these sources make students aware of the past and perspectives held by individuals during these time periods. Additionally, these sources give students the opportunity to draw comparisons between the past and present to establish a connection and relevancy to the material (Salinas et al., 2011).

Beyond the use of primary sources as a means of providing students with insight into past historical time periods these sources can be used to cultivate and examine the students' engagement in historical empathy. Historical empathy can be defined as the use of the perspectives of other people in the past to explain their actions (Barton & Levstik, 2004). Essentially, the goal of historical empathy is to find reasoning for individuals' actions by focusing on what they were attempting to accomplish, the nature of their beliefs and attitudes, the knowledge that they possessed, and historical as well as cultural implications and assumptions that they may have held (Barton & Levstik, 2004). The basic function of primary sources as it relates to their use in regards to historical empathy is as a means of interpreting historical perspective or the way in which individuals viewed and experienced certain time periods (Barton & Levstik, 2004).

Throughout past study of history the feelings of the individuals that were investigating certain time periods was largely absent (Barton & Levstik, 2004). Often times the viewing of the past through the lens of the present and with consideration of contemporary concerns was regarded as an immature development and implementation of historical inquiry (Barton & Levstik, 2004). However, empathy cannot lack care because it is care that motivates and shapes historical research (Barton & Levstik, 2004). The absence of this element in presentations of history to students results in an inability to cultivate interest in the study of history. Furthermore,

the element of care challenges students to make well-rounded conclusions about the past and formulate evolving perspectives of humanity (Barton & Levstik, 2004).

Methodology

In this study, students were exposed to a variety of primary sources and asked to express their reactions, feelings and the level of care or connection they felt to these sources. Through exposure to primary sources students were given the opportunity to analyze the multiple historical perspectives that are present throughout different past time periods and better reconstruct the past with an understanding of it and present situational conditions (Brooks, 2009). Additionally, some students were able to arrive at a point of greater self-awareness when they were allowed to examine their feelings and the different types of caring that they may have had for the subject that they were studying (VanSledright, 2001).

To identify a selection of students using primary sources to enhance their understanding of historical periods, I surveyed sixteen standard United States history and world history students from a public high school in North Carolina about their emotional connection to different historical periods as a result of primary sources. All of the participants were high school students within my student-teacher standard world history and U.S. History classes. Students either provided assent (at the age of 18 and older) or received parental consent (at the age of 17 and under) to participate within this study.

The tasks within this study included a pre-instruction survey that identified students' prior knowledge and understanding of historical events within United States History or world history. The survey focused on recognizing students' attitudes and level of care or concern about these events. The pre-instruction for the standard United States History class consisted of open-ended response and Likert scale questions. The survey included six open-ended response questions and ten Likert scale questions. The open-ended response questions examined students' understanding of factual information by posing questions like "What do you know about the event?", "Who were the important figures/groups involved?" etc. The Likert scale questions measured the level of emotional connection to the material within the unit. The mean and mode from the Likert scale responses were calculated to show the average and most common responses. Additionally, the researcher acted as a participant observer and collected data from students and their assignments using Spradley's (1980) Descriptive Question Matrix.

Similarly, the world history pre-instruction survey consisted of eleven questions, eight of which were open-ended responses and three that required a Likert scale response (asking students to score their response on a scale of 0 to 5). This survey was administered before students received formal classroom instruction on the subject by the teacher. It addressed both factual knowledge understanding (e.g. What do you know about the event? Where did this event occur? Who were the important figures/groups involved?) and measured the level of empathy that students felt about the topics they analyzed (e.g., Rate your level of concern about this event?).

The second task focused on the use of primary sources as a teaching tool in both standard classes. As an in-class activity throughout the course semester, participants in both classes received an introduction to primary sources and their relation to the historical topic being discussed on that particular day of instruction. Following this introduction, students engaged these sources through an activity or further instruction by the teacher. The teacher's role was to assist students in their learning and understanding of the use and historical perspectives present within primary sources. Another unit was taught absent of primary source use. The teacher presented the material throughout the course semester by alternating between primary source use and no primary source use. This is a quasi-experimental design that followed a counterbalanced design. The counterbalance design guaranteed that all students received all treatments (exposure or non-exposure to primary sources) but in different orders and times throughout the semester (Gay, et al., 2012). Finally, the same pre-instruction survey questions were used in a post-instruction survey to assess students' development of factual knowledge understanding and historical empathy.

Results

All United States history student participants responded to the pre-instruction survey open-response questions with no response or the written response of "I do not know" and the Likert scale questions with a ranking of five on all of their responses. On the post-instruction survey every student responded with varied answers to the open-ended response questions and attempted all of the Likert scale questions. On the Likert scale response statement one the average response was 3.4 with a modal score of 5. The second Likert scale question yielded an average response of 8.8 with a modal score of 10. The third Likert scale question resulted in an

average response of 5.8 with a modal score of 9. The fourth Likert scale question produced an average response of 4.2 with a modal score of 5.

Like the United States history students, the world history students that participated in this study all responded to the pre-instruction survey open-response questions with no response or the written response of “I do not know” and the Likert scale questions with a ranking indicating that they neither disagreed nor agreed with the statement. Every student responded to the post-instruction survey with varied answers to the open-ended response questions and attempted all of the Likert scale questions. The average response to Likert question one was 8.67 with a modal response of 9. While the average response to the Likert question two was 9.2 with a modal response of 10. Finally, the average response to the Likert question three was a 4.75 with a modal response of 5.

Discussion/Conclusion

There were several prominent findings that provided a well-rounded view of how primary sources have the ability to influence students’ understanding of historical events through influencing their level of care associated with the material that they are studying. First, most students were aware of the fact that the historical information that they understood or had an extreme curiosity about was a direct result of the them having an interest in the material or desire to learn new information. Although many students did not understand what the concept of historical empathy was they were often able to exhibit and measure the element of care in regards to the historical events that were studied within each unit. The major finding that I arrived at as a result of this study in regards to media literacy in social studies education is that the student participants were often more literate in media than other academic areas like prose or document literacy. From observations and conversations with some of these students I found that majority of them preferred media as the main means by which they wanted to be taught.

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Computers and Problem-Based Learning in Mathematics

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June 2013

Problem-based learning (PBL) is a pedagogical tool in which students engage in a problem without introductory knowledge. They work to solve the problem by using existing knowledge and applying it to the situation in order to reach a solution (Wirkala & Kuhn, 2011). The problems used in PBL are applications set in a real-world context. The National Council of Teachers of Mathematics describes technology as an essential element in teaching and learning mathematics. The use of computers can improve students' learning by enhancing mathematical instruction (NCTM, 2000). When implemented effectively, technology can be a tremendous tool for learning. "Computers can be used...as an environment for exploring mathematical concepts through interaction" (Huetinck & Munshin, 2008, p. 87). Instruction that is focused on making math relevant to students' lives has an engaging effect on learners. Since students will likely be using technology in the real world on a daily basis, it is important that they learn to be effective users of technology. This study explores how computer-assisted Problem-Based Learning (PBL) affects student interest and achievement in a high school mathematics course.

Literature Review

Researchers in various fields have studied the effects of PBL on students' attitudes and achievement. There have been numerous studies in medicine, science, and mathematics with findings that show that PBL increases student achievement and improves students' attitudes.

Concerning motivation and interest in science, both, Liu, Hsieh, et al. (2006) and Gürses, et al. (2007) provided findings that did showed that PBL increased motivation and interest. Other studies found supporting evidence that PBL improved interest or motivation (Akinoğlu & Tandoğan, 2007; Cerezo, 2012; Ferreira & Trudel; Lou, et al., 2011; Tarhan & Acar, 2007).

Research studies have found that PBL improved academic achievement in mathematics classes. PBL was shown to be effective in improving achievement in high school students (Clark, Breed, & Fraser, 2004). Other researchers drew similar conclusions in a fifth grade mathematics classroom where results showed statistically significant growth in students' ability to solve

problems correctly (Bostic & Jacobbe, 2010). Similar findings also came from a study of PBL in educational Statistics (Tarmizi & Bayat, 2011).

In addition, there has been some research to investigate the relationship between PBL and interest in or attitude towards mathematics. Several research studies found that PBL improved students' attitudes towards mathematics (Cerezo, 2004; Clarke, Breed, & Fraser, 2004; Kohlhaas, 2011; Tarmizi, Tarmizi, Lojinin, & Mokhtar, 2010).

Many researchers have concluded that the use of computers improved academic achievement and increased students' attitudes in mathematics. Eu (2013) used *Geometer's Sketchpad* to teach graphing and concluded that the program was successful at improving attitudes and achievement. Nordin, Zakaria, Mohamed, and Embi (2010) also found that Geometer's sketchpad was a successful tool that promoted higher order thinking skills and improved achievement.

In summary, research studies have found results that support PBL instruction. In the current study, students explored mathematical concepts using computers via a PBL approach. For this study, the question of interest was as follows: How does using computers to teach problem-based learning (PBL) in a high school algebra classroom affect student interest and achievement?

Methodology

Participants included 18 students enrolled in an Algebra I class in an urban high school in a southern city. Students involved in the study were 9th and 10th grade Algebra I students. Students spent two days learning to solve systems of linear equations. The brief instructional unit focused on PBL. Data was collected from the pre- and post-tests, survey responses, and interview responses. Pre-test and post-test questions were designed from curriculum materials and measured achievement. The survey and interview were used to measure students' interest in mathematics. Students first took a pre-test which was part of student's regular classwork, as well as data for the research study. After the pre-test, students participated in activities as part of a problem-based learning (PBL) unit. They completed learning activities in groups and using the computer. These activities were based on a PBL approach designed to help students retain and understand content in the mathematics unit. At the end of the PBL unit, all research participants completed a brief survey. In the survey, students were asked to answer questions regarding their attitudes about PBL and using computers. In addition, three participants were asked to take part

in a short interview. The participants were asked questions to determine how PBL affected their attitude of and interest in mathematics. The interview served as a way for students to further elaborate on their beliefs and attitudes.

Results

After data was collected and analyzed, the information was used to address the question of interest: How does using computers to teach problem-based learning (PBL) in a high school algebra classroom affect student interest and achievement? Data indicated an increase in achievement after students used computers during a PBL unit. In addition, data from the surveys and interviews indicated an improvement in student attitudes about mathematics.

Data from the pre- and post-test was analyzed by looking at individual growth as well as class averages. The mean of the scores for the achievement pre-test was 15.18 percent and the mean was 54.3 percent on the post-test, for an average gain of 39.12 percent. Of the students that took both the pre- and post-tests, 100 percent showed improvement. Table 1 shows improvement for all students that took both tests.

*Table 1
Pre- and Post-Test Achievement*

Student #	Pre-Test (Percent Correct)	Post-Test (Percent Correct)	Improvement
1	21%	50%	Yes
2	5.3%	31.6%	Yes
3	15.8%	71%	Yes
4	34.2%	89.5%	Yes
5	36.8%	65.8%	Yes
6	0%	10.5%	Yes
7	31.6%	100%	Yes
8	0%	23.7%	Yes
9	5.3%	34.2%	Yes
10	15.8%	52.6%	Yes
11	10.5%	22.4%	Yes

(Note: Data is displayed for only those who took both tests)

Since there was a consistent, positive increase, the data suggests that using computers and PBL in mathematics improved academic achievement.

The survey was used to analyze the attitudes of students towards mathematics. To analyze the survey responses, numerical values were assigned to each response, and then the average was tabulated. In one question, students were asked “to what extent did you like using computers to solve problems?” Numerical values were assigned to the responses: 1-Strongly dislike, (2) Dislike, (3) Like, and (4) Strongly Like. Based on responses, the average was 2.67,

indicating students mostly liked using computers to solve problems. Overall, it appears most students found aspects of the PBL and computers that they liked. If students enjoy learning mathematics, then their attitudes towards it will increase.

To study the interview data, themes arose in the responses. From the interview, all three students stated that they felt more interested during the unit compared to other units. However, two students indicated that they did not like using computers to solve problems; in particular, they said it made the mathematics more complicated. The students were also asked what aspects of PBL they liked. Two of the three students that were interviewed said that they liked being able to communicate with their classmates and work together to talk about the problems. Based on the interview responses and survey questions, PBL and computers did improve students' attitudes towards learning mathematics.

Discussion

In order to determine if students' academic achievement improved, data from the pre-and post-tests was compared. It is important to explore academic achievement as a factor in PBL since the teaching method can weigh heavily on the learners' successes. The pre- and post-tests served as measurement tools for studying students' understanding of content and concepts. For each student, the score on the post-test was greater than the score on the pre-test. In addition, the average of all of the scores was higher for the pre-test, indicating achievement was improved.

Data from the survey was used to study the attitudes of students. Student motivation and interest in mathematics is an important part of education. An effective teacher has a duty to create and implement instructional lessons that are highly motivating and spark interest in students. Based on the students' survey responses, PBL can improve students' interest. When the method of instruction helps keep students interested, then students will be more likely to enjoy learning. The interview served as a tool to better gauge the attitudes of students. Responses from the interviews were similar to those from the survey. Overall, students felt that PBL instruction was interesting, but some responses indicated that the computer use complicated learning.

Based on all of the data, PBL instruction increased academic achievement and improved students' attitudes towards mathematics. Every student had a larger percentage of correct answers on the post-test than on the pre-test. In addition, the class average improved. Students also indicated that they enjoyed working together and communicating about mathematics. Instruction that is focused on making math relevant to students' lives has an engaging effect on

learners. A real world problem helps to engage students by making content interesting. Since students will likely be using technology in the real world on a daily basis, it is important that they learn to be effective users of technology. If teachers use PBL in mathematics, students' understanding about concepts and attitudes towards mathematics will improve.

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Developing Empathy through Identity Enactment Techniques

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June 2013

This study focuses on empathy development in the high school English classroom by responding to one primary research question: How does identity enactment affect empathy for fictional characters? The study aims to facilitate empathy development in students in order to address current social issues like bullying and apathy through promoting a better understanding of fictional characters, many of whom may be quite different from the students themselves.

Literature Review

Empathy is a concept that is defined, for the purposes of this study, as the ability to understand, identify with, and/or feel for another individual or group of people. Many researchers have noted that empathy development is best described as a process, rather than an instantaneous development, that approximates a person's understanding of him/herself and the understanding of another (Louie, 2005; Luce-Kapler, Sumara, & Ifody, 2005). Empathy is a difficult entity to define and quantify, but nonetheless, it has been studied in a variety of settings. Some such settings are the educational realm, psychological studies, and the field of medicine. Empathy development has been shown to improve understanding of other cultures in a classroom (Tomcho & Foels, 2002), where the researchers simulated the creation of different cultures and examined the students' attempts at cross-cultural empathy.

In one psychological study (Masten, Gillen-O'Neel, & Brown, 2010), findings showed that, despite groups being arbitrarily assigned by the research team, subjects with social anxiety empathized more profoundly and more immediately with members of their own groups. Additionally, clinical empathy has been studied in the field of medicine in order to improve what is commonly called bedside manner for medical professionals. One study found that writing activities and role play improved doctor-patient relationships significantly between the subjects and their mentally ill patients because the subjects developed a complex and emotional understanding of their patients' diseases (Poorman, 2002). Just as the researchers in the aforementioned studies were able to use empathy to improve relations between different groups,

students who develop empathy for fictional characters in a high school English classroom may improve actually their relationship with literature.

This research concerns the study of empathy development through identity enactment. For the purposes of this study, identity enactment refers to the adoption of another identity through some form of creative expression for a limited period of time. Dramatic role playing and first-person writing are two identity enactment techniques that have been studied to improve empathy. Dramatic role play has been shown to increase empathy development and engage students (e.g., Goldstein & Winner, 2012). First-person writing has shown similar benefits, such as establishing points of contact and a more profound understanding of another person (e.g., Deen, Mangurian, & Cabaniss, 2010). Such methods allowed subjects to develop and exhibit both cognitive and emotional empathy. Cognitive empathy designates a mental understanding of the state of mind of someone else, whereas emotional empathy occurs when an individual elicits a parallel or responsive emotion in reaction to another's emotions (Stephen & Finlay, 1999). Additionally, the development of historical empathy, or an acute understanding of the atmosphere of a specific historical time period, was also a goal of identity enactment.

Methodology

This study took place in a midsized, suburban public high school in the southeastern United States. The participants were students in a sheltered English I course taught by the researcher. A sheltered course is one reserved for English Language Learners. This study was first approved by Wake Forest University's Internal Review Board and the school district in order to ensure the safety of participants before all students in the class were invited to participate. The study was also designed to deviate minimally from the normal classroom routine. The students were informed that participation was strictly voluntary and asked to return a letter of consent. Of seventeen students in the class, eight consented to participate in the study.

This research was carried out throughout the course of one unit, lasting six weeks in duration. After reading the first part of Harper Lee's *To Kill a Mockingbird* and before beginning the second part of the novel, students completed a preliminary reading inventory evaluating their empathic reactions to the text. Items on this inventory were measured on a scale from "Strongly Disagree" to "Strongly Agree," with the latter indicating the strongest empathic response. After the students completed this survey and began reading part two of the novel, they began a series of identity enactment activities and completed a final summative assessment. These activities

were comprised of short writing from the perspective of different fictional characters as well as performance-based activities where students role-played the characters. Examples of specific activities included writing letters or diary entries from the perspective of different characters, reenacting scenes from the novel, and envisioning the internal feelings of various characters during a trial scene from the novel.

For the summative assessment, students answered a questionnaire from the perspective of a character, drew a detailed portrait of that character, and then chose either a longer writing assignment or an extended performance, again enacting a particular character's identity. Finally, the students were asked to respond to verbal questions similar to the items on the preliminary reading inventory by positioning themselves around the room according to how intensely they agreed or disagreed with the given statement.

Data was collected through three methods: survey-style reading inventories, informal observation and memoing, and identity enactment artifacts. Initially, as mentioned, a preliminary reading inventory served as a survey tool to collect data before the identity enactment activities took place. The verbal Agree/Disagree activity acted as a post-test survey. A second method of data collection was the recording of informal observational notes throughout the unit. At the conclusion of each class containing identity enactment activities, a daily memo was recorded, which became a record of student behavior during the identity enactment activities and provided memorable moments from the day. These notes were important to track the students' responses and overall progress because the development of empathy is such an abstract concept, and as the memos were written in close proximity to the daily lessons, they also served as a record of specific classroom details. Lastly, identity enactment artifacts were important in determining the results of this study. The students who chose to do a performance piece for their final project were filmed, and this footage was used, along with student writing and other work, as artifacts from which evidence of empathy for fictional characters was inferred.

Due to this study's heavy reliance on artifacts, observational notes, and other qualitative data, constant comparative analysis was used during data analysis. The gradual process of coding qualitative data described by Corbin and Strauss (1990) was utilized as a framework to analyze the large amounts of information collected throughout the study. The process moves from open coding through axial coding and finally to selective coding. The aim of coding was to sort, organize, and select data into various themes. A logical outcome of this process was to

categorize the data under various types of empathy: cognitive, historical, and emotional. Additionally, a fourth type of empathy emerged which became its own distinct category. This theme has been dubbed fictional empathy, and it concerns the students' empathic responses for other fictional characters as they were enacting the identity of one character. To ensure trustworthiness, the following methods were utilized: thick description, researcher positionality, triangulation, prolonged engagement and persistent observation, and peer review.

Results

The data was coded into four major themes that categorized students' responses and behaviors. The first of these themes is cognitive empathy, or the ability to understand a character's perspective, mental process, or point of view. Second, historical empathy refers to a deep, authentic understanding of the character's historical milieu. The third type of empathy discussed is emotional empathy, which concerns the emotional response of a subject either in reaction to or parallel with a fictional character. A final observation that emerged found that the subjects began developing a more complex understanding of empathy as they empathized for *other* characters in the novel through the perspective of a fictional character. This type of empathy is unique to this research study, and will be referred to as fictional empathy.

Cognitive empathy

Students demonstrated an understanding of the characters' mental states and perspectives throughout the unit through expressions of logic, mental processes, hypothetical thinking, and cognitive awareness in times of emotional distress. The students demonstrated the ability to cognitively empathize with characters during situations of extreme emotional turmoil for the characters. In this way, the students demonstrated a complex and acute understanding of different characters' mental states. For example, one student writing as a woman whose husband just died pondered how she would find money and food to feed her children, whereas another student, writing as a girl who was about to perjure herself, thought about what kind of false testimony she would need to plan.

Historical empathy

Establishing empathy for the historical time period and atmosphere came rather easily to this group of students. Throughout the reading of the novel, students participated in scaffolded lessons centering on historical events that explained to them the time period, such as segregation and The Great Depression. They empathized immediately with victims of segregation and race

laws, particularly because some of them found out their ethnicity or race was part of a persecuted group at the time. Their sense of historical empathy was somewhat ubiquitous throughout their work and mostly centered on the figure of Tom Robinson. They demonstrated a deep understanding of the racial conflict but also incorporated socioeconomic status into their empathic responses. The most common example of historical empathy was the subjects' assertion that Tom was convicted wrongly due in large part to the jury's racism.

Emotional empathy

The students exhibited an extensive and complex range of emotional empathic responses. The two most prevalent empathic responses were anger and sadness, but most of the subjects' responses incorporated two or more emotional responses into one statement. Common trends in the written responses were subjects' parallel empathic responses to Mayella's fear about the trial, Tom Robinson's fear about death, Atticus' anger at not being able to win the case, and Helen's sadness at her husband's death. In their writing, the tone and diction of each assignment indicated the subjects' complex emotional responses and ability to feel as the character felt during the situation described. In dramatic role play exercises, the students' choices in dialogue, costume, movement, and interactions with other characters also demonstrated their empathy development.

Fictional empathy

A final, unexpected trend that emerged was that students began expressing empathy for other characters through the perspective of the character whose identity was being enacted. The students recognized the complex identity of many characters and expressed that understanding as a form of empathy for other fictional characters. At times, the students were more concerned about others than the character being enacted, and they empathized with these other characters quite profoundly. For example, when writing from the perspective of Tom Robinson, many students expressed concern, sympathy, love, and anguish for his family members and put the family's needs before his own.

Discussion

Students exhibited each type of empathy described in the results in ways that were complex, authentic, and nuanced. In spite of their limited language capabilities, the students were able to achieve a very holistic and mature understanding of several of the characters and also personally identify with those same characters. Writing and acting as the characters helped to

establish a deeper understanding with the characters and a connection to them, similar to the results found by Poorman (2002). The development of empathy for these characters was a process that occurred throughout the study, similar to the process described by Louie (2005) and Luce-Kapler et al. (2010), as students both acclimated to the identity enactment activities and began to engage in a cycle of understanding the characters as well as themselves. Thus, the students did develop empathy for the fictional characters by the conclusion of this study.

However, one major limitation of this study is that identity enactment cannot be separated from any other factors that may have influenced the empathy levels of the students, which may include the faster pace and more dramatic plot of the second half of the novel, the students' personal backgrounds and experiences, and the researcher's own enthusiasm for the novel and the identity enactment techniques. Nonetheless, these identity enactment techniques still merit further study and use in English classrooms as the students were highly engaged, felt deeply attached to the characters, and developed empathy that was both authentic and multifaceted.

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Literature 2.0: An Exploration of Character using *Edmodo*

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While there is a fair amount of research on teachers using Web 2.0 tools to create virtual classrooms, still there is not widespread use of social networking sites (SNSs) and online file-sharing sites in schools (Robins & Evans-Jones, 2012). According to Robins and Evans-Jones (2012), this is largely due to parents worrying that media will be substituted for rigor and that school systems may block many of these sites for Internet safety. There is a gap in the research on how students connect to texts through the use of social media, and this study intends to help fill this gap. The goal of this qualitative study is to provide valuable insights into the effects of social media and Web 2.0 technologies on student connection with literature. There is one primary research question under investigation: How does the use of Web 2.0 technology in the secondary English classroom affect student interaction with literature?

Literature Review

A strong and resourceful teacher should always search for new and innovative ways to engage his or her students. The present generation of students is considered as a group of native speakers when it comes to technology (Prensky, 2011), and researchers and teachers alike are interested in how Web 2.0 technologies can be used in the classroom. Web 2.0 is defined as any Internet tool that features collaboration and contributions from its users (Robins & Evans-Jones, 2012). SNSs, blogs, wikis, and image sharing sites all fall under the umbrella of Web 2.0 tools. Students are inundated with technology (Prensky, 2001), and many researchers are curious as to how this technology can be best utilized in education (e.g., Dick, 2011; Haughey & Barnes, 2011; Luckin et al., 2009; Taliaferro, 2011). For example, blogs, wikis, and social networking services have all been used in collaborative writing assignments, and some teachers have even created virtual role-playing games where their students take on the objectives of a character from fictional stories (Casey & Evans, 2011; Haughey & Barnes 2012).

One of the worries about the use of Web 2.0 tools in the classroom is whether they actually generate critical thinking and reflection skills in students rather than merely functioning

as a hook to engage them. Boas (2011) states that the Internet is unique in its ease for creating scenarios where students can research, collaborate, and generate ideas, all in a medium in which they are accustomed. In Riddle's (2009) study that focused on the use of online role-play as part of the curriculum, students were seen delving deep into the roles of political advisors and journalists while discussing fairly complex themes of power. Students found that as the game progressed, the journalists were increasingly dependent on the advisors to feed them information, which led the class to a discussion of the undercurrents of power inherent in social structures.

According to Krathwohl's Taxonomy (2002), which was based on Bloom's Taxonomy and revised to better reflect 21st century skills, the taxonomy begins with the lowest level of cognition, remembering, and continues upward to higher levels of cognition: understanding, applying, analyzing, evaluating, and creating. In their research study, Callaghan and Bower (2012) found that in one particular class being studied, "92% of students were observed in applying higher order thinking skills of 'evaluate' and 71% were demonstrating 'create'" (8). The students that demonstrated the higher order thinking skills did so through frequent forum discussions, blog posts, and an e-portfolio assignment.

Parkes and Kajder (2010) claim that "reflective practice is seen to be one of the single most helpful strategies a student can employ to further their understandings" (220). The researchers found that the incorporation of new Web 2.0 technologies led students to more reflective techniques, and their self-examinations were more intensive and exacting (Parkes & Kajder, 2010). In addition to a focus on the use of Web 2.0 technologies, the present study also explores reader response theory and the use of role-play. Both of these techniques have shaped pedagogy in English language arts, focusing on how teachers use students' own experiences to connect with characters (Johannessen, 2001). The idea of role-playing has also been successfully used in creating new ways for students to connect with literature (Taliaferro, 2012).

Methodology

Setting

The study was conducted in a large public high school in North Carolina. The school has better than average access to technology with several computer labs on the campus and a flat screen television in each classroom. This study took place in an eleventh grade standard English class. Eleventh grade English focuses on American literature, short stories, and foundational texts, such as the Bill of Rights. Students in this class read *The Adventures of Huckleberry Finn*,

Of Mice and Men, and *The Crucible*, in addition to a variety of short stories by American writers. The eleventh grade class was chosen specifically because Common Core standards for that grade level lend themselves to the integration of technology.

Participants

The researcher used a mixture of convenient and purposeful sampling to select participants (n = 20). Ultimately, all students in one of the researcher's eleventh grade English classes were invited to participate. Only students who completed consent forms, surveys, and the final project were included in the study. The researcher obtained approval from the IRB and local school system before beginning the study. Students were informed that their participation was completely voluntary, and all students have been given pseudonyms to protect their identities.

Data Collection Methods

Over the course of the study, students were asked to complete two reading inventories—one before the project and one after the project. The questions included in the inventories asked students how they felt about past English classes and the assigned readings, their reading habits outside of the classroom, their favorite subjects in school, their feelings about characters from literature, and their familiarity with and feelings about web 2.0. After the first survey, students participated in a final project for *The Crucible* unit. In this project, students created a character profile using Edmodo and role-played a character from *The Crucible*. Students were asked to interact and post as their given character, and the project ended with the students writing a short reflective piece where they use textual evidence to support their portrayal of the character. The data collected in this study consists of student responses to the two surveys and information from the profiles that students created. Data analysis consisted of constant comparative analysis, which included three stages of coding: open, axial, and selective.

Results

Findings suggest that students demonstrated a strong understanding of the assigned reading, *The Crucible*, and of their assigned character's motivations, and several students commented that they most enjoyed the role-playing aspect of the project. While analyzing the data, two primary themes emerged: interaction and rigor.

Interaction

The first theme emerging from data analysis was the idea of interaction and collaboration, which occurred as a result of the Edmodo project. Students demonstrated two kinds of

interaction: peer interaction and interaction with the characters. Peer interaction is defined as students interacting with other students while remaining in character, while character interaction focuses on how a student felt about the role-play and interactions with their own character.

In addition to posting status updates, students were required to reply a minimum of ten times to the posts of other students. While looking at students' total number of posts and replies, it was clear that several students enjoyed the aspect of commenting on other peoples' posts as many had far more replies, sometimes double the amount, as they had posts. While this does not mean that one type of post was preferential to another, it does demonstrate that students spent the majority of the project verbally engaging with their classmates. Often the strongest examples of role-playing came from threads where multiple characters had commented on a single post.

A second sub-theme that emerged from data analysis was the idea of role-playing and how students responded to the activity. In the post-inventory, students were asked about their favorite part of the social networking project. Several students said that they enjoyed role-playing as the characters. In addition to students interacting with their characters and peers, students also demonstrated excellent knowledge of the play and various levels of critical thought.

Rigor

The second theme that emerged from the data was the idea of rigor. For the purposes of this study, rigor is defined as the use of critical thinking and reflective practices in student work. Throughout the project, students demonstrated a strong understanding of the plot of *The Crucible* and of their character's motivations. Some students were even able to create scenarios for character that did not occur in the play but that stayed true to the character's personality and behavior. Finally, in their reflections, many students effectively used textual evidence to support their role-play choices. Rigor in this study was measured against Bloom's revised taxonomy. Krathwohl (2002) revised Bloom's original taxonomy to better reflect relevance to 21st century skills. The revised taxonomy privileges creating and evaluating above other skills demonstrated by students. In the Edmodo project, students primarily showcased four of these skills: remembering, applying, evaluating, and creating.

Discussion

The post-reading inventories made clear that while many of the students maintained a lack of enjoyment of literature and/or reading, the evidence from their actual projects seemed to suggest the opposite. Through their projects, students showed an increased level of critical

thinking and engagement with the text, behavior that was supported by a majority of students suggesting that they would like to repeat the project. Due to the nature of assignments, students also showed increased levels of collaboration and interaction, a skill that is becoming increasingly important in our globalized society.

Interaction and Familiarity

Several students stated outright that the aspect of the project they most enjoyed was replying to their classmates on Edmodo and working together collaboratively. The fact that most students had more replies than posts is reminiscent of the findings of Koh et al. (2009), who concluded that true collaborative work between students can lead to interdependence and the joint production and creation of knowledge. During this study, students would often post statuses that referred specifically to other characters by name. This shows that students were encouraging their classmates to interact with them so that they could create shared meanings of the text together. Similar to the findings of Haughey and Barnes (2011) and Taliaferro (2011), the virtual aspect of the project allowed students to more easily share with one another while still role-playing with their assigned characters.

Rigor

Though some worry that Web 2.0 tools function more as a gimmick to hook students rather than a tool to foster creativity and critical thinking skills, the students in this study exhibited over half of the skills thought to be important in a 21st century society based on Bloom's revised taxonomy. In their projects, students successfully demonstrated their knowledge of the play and their understanding of the play's characters. Not only were students able to accurately portray their character's motivations, they also understood how their respective characters felt about and reacted to other characters in the play. Students also showcased outstanding creative and reflective practices. These findings support those of Callaghan and Bower (2011), who found that Web 2.0 tools can foster higher order thinking skills.

Conclusion

Both for the researcher and for other teachers, this type of project (and other Web 2.0 projects) is important because of the learned skills as well as the peer/character interactions. 21st century skills are becoming increasingly more important in the current job market, and teachers have a duty to prepare students for the world they will encounter after leaving high school. As such, this study demonstrates a practical example that can help teachers support students while

engaging them with literature on a deeper, more critical level as well as teaching them the technology and social skills that will help them as they move forward in their everyday lives.

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Flipping the High School Mathematics Classroom

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Mathematics is often still taught in a historically traditional manner. That is, teachers often require students to read the textbook on their own time and they lecture in class to synthesize and extend that material. According to Deslauriers, Schelew, and Wieman (2011), lecturing remains the prevailing pedagogy for teaching math, even though an increasing number of studies suggest there are alternative methods that are more effective. Many educators are trying to evolve the current system to be more relevant and responsive to the current generation's needs. While some are focusing on technological innovations, others have delved into reformatting instruction to veer away from the teacher-centered atmosphere (Cubukcu, 2008).

Educators refer to one of the emerging formats of instruction as the flipped classroom. In the flipped classroom, the instructor reverses the roles of class work and homework. Lectures, slideshows, and formal instruction occur on the students' own time. Subsequent investigation, problems, and projects occur in the classroom under the teacher's supervision. The flipped methodology encompasses various elements from other forms of instruction. Specifically, online education, student centered education, and hybrid or blended education are three of the foundational pedagogies of the flipped classroom. This study investigated the effects of the flipped classroom model of instruction on student perceptions, attitudes, and beliefs of competency in high school mathematics.

Literature Review

Online Instruction

Through online instruction, an instructor can reach a much wider population. The expansion of technology and related resources has enabled this form of education to grow worldwide. Researchers have found that student attitudes are inconsistent towards online instruction. George-Palilonis and Filak (2009) found that students often believed video lectures were boring. They also point out that in some cases students have a negative attitude towards this style due to the lack of personal contact. On the contrary, Cubukcu's (2008) findings reveal

that university students tend to have positive attitudes and view the Internet and technology in general as helpful educational tools. Online lessons can diminish feelings of embarrassment because students have the ability to review the lecture as needed and need not feel publicly ashamed for their trouble understanding (Flipping the Classroom, 2011).

Generally, researchers agree that online instruction and traditional instruction create similar belief levels. Frederickson et al. (2005) did not find a difference in students' perceptions of competency when taught through online instruction versus traditional instruction. However, researchers did find that online instruction increases student achievement. Students have a greater level of control over the pace of the instruction in web-based learning, leading to this increase in achievement (Frederickson et al., 2005).

Student-Centered Instruction

Minogue (2010) explains student-centered learning as teachers collaborating with students and taking on a supporting role in the learning process. Wang, Myers, and Yanes (2010) believe that the improvements in technology have helped the transition from teacher-centered to student-centered classrooms. Taking a student-centered approach to classroom instruction can result in more positive student attitudes, shown through increased engagement and interest. Depaepe, De Corte, and Verschaffel (2007) stress that this shift in education de-emphasizes the teacher and the focus on algorithms and procedures, and instead emphasizes the importance of reasoning, problem solving, and application. Deslauriers, Schelew, and Wieman (2011) found that student engagement nearly doubled with student-centered learning, and attendance increased 20% (Deslauriers et al., 2011).

Researchers hold contrasting opinions on the effect of student-centered instruction on achievement. In one study, Wentland (2004) found that a collaborative instructional approach failed to result in significant achievement gains for the majority of students. Wu and Huang (2007) provide evidence that ultimately student-centered instruction led to no significant increases in student achievement. However, researchers also note some positive aspects of the student-centered approach. For instance, engagement positively correlated with academic achievement on standardized tests (Wu & Huang, 2007). Similarly, Choi and Yang (2010) found that student-centered learners had better long-term retention than those in teacher-centered classes.

According to Wu and Huang (2007), student-centered classes resulted in increased confidence, decreased anxiety, and overall increased positive attitudes towards the material. They further suggest that students may need more support if they are not accustomed to student-centered learning because they may lack confidence in their creative self-efficacy, affecting their discovery and inquiry skills.

Blended Instruction

George-Palilonis and Filak (2009) explain blended, or hybrid, learning as a combination of traditional and digital content delivery. Doerr and English (2003) stated their belief that the textbook limited students and their learning experiences. George-Palilonis and Filak (2009) supported this idea, realizing that traditional models often fall short of addressing all students' learning styles. If used properly technology can address this issue in a blended classroom, reaching more students through various methods of instruction.

Researchers have found that blended learning significantly improved student attitudes. Choi and Yang (2010), George-Palilonis and Filak (2009), and Oliver (2008) all found in their respective studies that blended learning instruction reduced students' negative emotions towards the subjects. Another important finding is that blended learning increased students' beliefs of competency in the subject. Cascaval et al. (2008) concluded that the blended classroom structure added significant value to education with notable improvements in perceived performance and overall experience. Likewise, George-Palilonis and Filak (2009) agreed that students felt a greater sense of pride in their own work as a result of blended learning instruction. Students also saw the application of the material more realistically and could then connect with it on a more meaningful level (Choi & Yang, 2010; Doerr, 2003; George-Palilonis & Filak, 2009).

Additionally, researchers agreed that blended learning led to significantly higher achievement. As Wentland (2004) explains, incorporating technology may be the key to increasing achievement in the current generation of students. Cascaval et al. (2008) discovered that archived lectures helped students grasp the challenging concepts taught in this class by giving them the opportunity to rewind and replay lectures (Cascaval et al., 2008). Hwang (2011) found that pre-class reading or videos and electronic discussions had a significantly positive impact on achievement.

Methods

The participants in this study were 22 high school juniors enrolled in an International Baccalaureate Standard Level math class. Students received instruction under the Flipped Classroom model for lessons in a unit on trigonometry. Table 1 shows a brief description of the lessons. Upon conclusion of the unit, students completed a ten-item survey questionnaire consisting of both Likert-scale and open-ended questions regarding student perceptions, attitudes, and beliefs of competency.

Table 1: Flipped Classroom Trigonometry Unit Outline

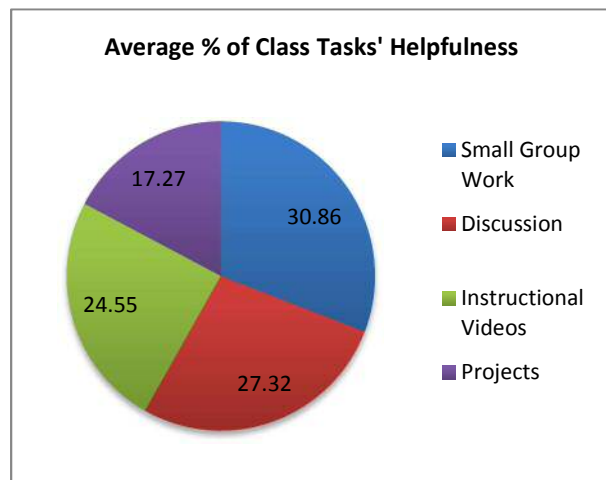
Topic	Essential Question	Homework: Prior to Class	In Class Activities
Unit Circle	How can I use the unit circle to evaluate trigonometric functions?	Two Khan Academy instructional videos online posted to class website	<ul style="list-style-type: none"> Hands on creation of individual unit circles through use of special triangles Exploration activity: How trigonometric functions relate to the unit circle
Trigonometric Graphs	What do the graphs of the trigonometric functions look like?	Two Khan Academy instructional videos online posted to class website	<ul style="list-style-type: none"> Discovery activity using spaghetti and the unit circle for students to develop the graphs of trigonometric functions
Trigonometric Graphs – Continued	How do I interpret [changes in] trigonometric functions?	Two Khan Academy instructional videos online posted to class website	<ul style="list-style-type: none"> Explore parts of trigonometric graphs and equations. Discover amplitude, period, and shifts and their effects
Applications of Trigonometric Graphs	How do I represent data using trigonometric functions?	Two Khan Academy instructional videos posted to class website	<ul style="list-style-type: none"> Use real data to develop equations and interpret equations
Applications	How do I use trigonometry in the real world?	Two Khan Academy instructional videos posted to class website	<ul style="list-style-type: none"> Application activities for graphs, data, triangles, etc. Student development of applications that use trigonometric functions

Results

In the first question, participants were asked to weigh each of four aspects of the flipped classroom based on the amount each helped them learn. Results can be found in Figure 1.

Questions 2-6 were Likert scale questions addressing student attitudes, perceptions, and beliefs of competency. In summary, a clear majority of students felt more motivated in math due to the flipped classroom and felt as though the flipped style helped them learn math. However, the sample was

Figure 1: Student Responses to Question 1



relatively split on the enjoyment of the videos for homework, the relative learning of material, and confidence going into the test.

The remainder of the questionnaire was open-ended for student feedback. With regards to the most challenging aspects of the flipped classroom, most students did not note any element as being challenging. Some students mentioned difficulties with the hands-on approach due to learning styles, distractions from group work, boring videos, and general difficulty adjusting to a new style of learning. Contrarily, 13 students mentioned group work, hands-on activities, and/or classroom projects as the most enjoyable aspect. Students explained that this time allowed for more freedom, experience, and fun. When asked whether they would prefer to learn in the traditional manner or the flipped style of instruction, 13 students chose the traditional, while seven chose the flipped, and two students had no preference. Of those that would prefer traditional means of instruction, the majority indicated this was their preference because it was what they were accustomed to. Of those that would prefer the flipped style of instruction, the main draw was the exploratory nature and integration of more applications.

Discussion

George-Palilonis and Likak (2009) found that video lectures were often described as boring or too static, which was reflected in the results of this study as well. Many students did not like watching the videos for homework because they found them redundant and difficult to pay attention to. For this study, previously developed instructional videos from outside sources were used, which may have affected the students' opinions of and attention to the videos.

Further, this study found a near even split between students who felt they understood the material better learning in a flipped classroom as opposed to those who did not, as well as a split between students who felt confident going into the test after learning in a flipped classroom and those who did not. Some of this can surely be attributed to the delivery of direct instruction through video lectures and is supported by the answers to the questionnaire, as mentioned.

The findings of this study support Wang et al. (2010) who claimed that the improvements in technology have helped to transition from teacher-centered to student-centered classrooms. This study found that students generally like working in groups and valued this time in class when learning under a flipped style of instruction. Some students mentioned that the increased group work helped improve their motivation, understanding, and interest in the topic. Further, one student mentioned that they liked the class activities because it allowed them access to the

teacher when they had questions with applications, a benefit of the flipped style over traditional. Overall, the shift towards a more blended and student-centered classroom environment was found to increase positive student attitudes, which aligns with previous research. However, this study found that students might need more time to adjust to the different style of the flipped classroom.

This study found the flipped classroom model of instruction to have a generally positive effect on student attitudes and perceptions, specifically relating to the classwork aspect aligned with that of student-centered and blended classrooms. However, it cannot conclusively suggest that the flipped instructional method has an effect on students' beliefs of competency, compared to traditional instruction. Further research is needed in the area of the flipped classroom to address these and other educational questions. Other areas that could yield potentially significant insights are how the flipped classroom model effects long term retention of material and the development of higher-order thinking skills.

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**Environmental Literacy Meets English:
How Students Think about Sense of Place in the Classroom**

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Whether or not educators feel that environmental topics belong in secondary English classrooms, every course nonetheless espouses an ethic by choosing to emphasize one subject and ignore others. One might consider the question of what belongs in English language arts classrooms. Is English the study of literature, of culture, of the world, or a chaotic mosaic of it all? Most schooling paints the assumption that life is anthropocentric, that all earthly life revolves around human concerns. Regardless of the veracity of this assumption, the implicit nature of its transmission to students who do not have a say in the matter is troubling. In fact, many students are not aware that they are inheriting a powerful ethic at all. Students at least deserve what could be a profoundly educational opportunity to discuss and probe some of society's most pervasive assumptions. *Places* are bundles of pedagogical potential. Exploring place entails exploring also one's own deep narratives about self, society, and belonging.

The general purpose of this study is to expand the foundations of environmental literacy in the English classroom for others to build upon, both teachers and researchers. More specifically, the study will show how sense of place as a concept, along with place-based education as an instructional method, can challenge students to think critically and holistically about their roles in the world. It justifies its relevance in the English classroom precisely by challenging the definition of the classroom. Therefore, the research question asks: How do students think about sense of place in the English language arts classroom?

Literature Review

The National Council of Teachers of English articulates literacy as a dynamic concept that responds to changes in society and technology. This stance is consistent with Paulo Freire's (1987) assertion that reading the word implies continually reading the world. The stance is also consistent with a multiliteracies approach to English pedagogy, which emphasizes the diverse modes of representation in today's world, including images, films, political cartoons, and Web

2.0 tools, to name a few. Building off this dynamic movement between word and world, this study uses the concept of *sense of place* to bridge two subfields of educational research: critical pedagogy and place-based education. Gruenewald (2003), one of the few researchers to unite these two fields, asserts that place-based education offers an important ecological context for many of critical pedagogy's ideas that have tended to privilege urban settings. Conversely, critical pedagogy offers place-based education the significant theoretical grounding it lacks, especially regarding social/political issues. Together, the two fields strengthen the other's critical stance by becoming more inclusive.

Borrowing from Ardoin's (2006) framework, this study defines *sense of place* as the holistic understanding of how one's psychological, political/economic, and socio-cultural relationships are grounded in particular places. This holistic definition responds to a common criticism of the sense of place concept, namely that *place* for a long time has been synonymous with only geographic spaces or limited even further to a rural aesthetic (Ardoin, 2006). Similarly, many people conceive of the concept of 'environment' as some wild and green place rather than the whole of one's surroundings. In an increasing global and mobile society, both the urban context and migratory lifestyles need further consideration in relation to sense of place (Azano, 2011). Therefore, this study defines place-based education as an experiential, learner-centered pedagogy which uses the local community and/or environment as a platform for encouraging interdisciplinary inquiry and direct communal engagement (Bruce, 2011; Sobel, 2004).

Whereas most sense of place research has concentrated in other disciplines such as psychology and anthropology, the connection between sense of place and the English classroom has been largely overlooked. Only recently has the gap in secondary English classrooms been bridged by researchers (Azano, 2011; Bruce, 2011). These scarce but relevant studies tend to look at either writing assignments or reading assignments as entry points into *place*. The present study also relies heavily on reading and writing instruction; however, it also relies on a multiliteracies approach to English language arts that uses scientific articles, documentary films, and political cartoons. At its most basic, the goal of English language arts and the multiliteracies approach is for students to engage with ever-evolving forms of language and develop the critical skills necessary to "read the world" (Freire, 1987). The situating of this study between critical pedagogy and place-based education, between word and world, and between English and environmental literacy is what makes it a unique contribution to the discourse.

Methodology

As part of this study, participants from this large public high school consisted entirely of students regularly enrolled in the teacher-researcher's Advanced Placement (AP) English class. The researcher introduced sense of place using a student handout based on Ardoin's (2006) framework. Over the duration of the semester, participants were assigned a series of written responses—two journal entries and a short essay—that required both personal reflection on sense of place and textual connections. Consistent with a multiliteracies approach to English education, these texts ranged from canonical literature to documentary film to poetry to scientific graphs to political cartoons. The journal entries and essay were assigned during standard units in the AP curriculum. That is, instructional methods were not distinctly place-based, and neither was sense of place the focus of these respective units. Instead, the concept was interwoven into multiple lessons and prompts throughout the units.

Conversely, the final unit of the semester was an interdisciplinary unit on food production taught using a distinctly place-based instructional approach. The unit lasted almost a month and was centered on *Food Inc.*, a documentary film about the food industry. This unit also employed a multiliteracies approach by representing food- and place-related issues with a diverse array of media. Participants submitted a grant proposal for a local solution to a food-related problem at the conclusion of the unit.

The written responses were collected as data along with the final grant proposal. Following qualitative research methods, video footage was used to help support or refute observations from the different sources of written data. Data was analyzed using constant comparative analysis, a recursive process grounded in both the research question and review of literature. The coding process was divided into the stages of open, axial, and selective coding to create an analysis of themes (Corbin & Strauss, 1990). Additionally, Ardoin's (2006) framework that defines place using four dimensions (i.e., biophysical, psychological, socio-cultural, and political/economic) was used during this coding process in order to keep the analysis centered on the research question. To ensure trustworthiness, five validation strategies were utilized: prolonged engagement, triangulation of methods, peer review, researcher positionality, and thick description. Ardoin's (2006) framework eventually produced categories from which five themes emerged: community, family, remembrance, nature, and experiences. Due to the extensive amount of data, representative case study participants were chosen to embody each theme.

Results

The students' initial journal responses about sense of place varied from understandings rooted in particular localities to purely social understandings that disregarded place entirely. Despite the myriad differences between these responses, observable nuances and trends emerged revealing similarities between how students thought about sense of place. While some journal responses included multiple relationships—social, economic, political, environmental—and regarded sense of place as a complex juncture similar to Ardoin's (2006) framework, other journals elaborated a single relationship in depth, such as fondness for a familiar location or person.

The community theme emerged from a relatively small group of student responses that espoused a strong and consistent communal ethic. These responses implicitly suggested a duty to other people as well as to the land. The students who espoused this communal ethic conceived of lifestyles and settings as integrated or inseparable. Take fishing as a hypothetical example. Whereas other students might have considered fishing merely a hobby, these community oriented students would view fishing as a lifestyle, as part of one's identity, and also as a mandate to take care of the local pond. With striking maturity, these students displayed an understanding not only of relationships but also of interrelationships and membership.

The family theme emerged from students whose responses privileged familial relationships over other social or environmental interactions. Thus, backyards and childhood play places were often recalled with fondness. These place relationships, however, often had little to do with the land itself. The old backyards were secondary to the familial relationships; the yards derived their whole significance from the social context.

The notion of remembrance emerged from students who did not reference place, setting, location, or the physical environment at all. In Ardoin's (2006) framework, the "biophysical" dimension was neglected entirely. Some students even directly stated that place did not matter to them. The key method by which these students thought about sense of place might be called "reciprocal remembrance," or the process of remembering others as well as being remembered themselves. These students understood the power of place to reside in vivid memories, flashbacks, and other deep psychological spaces.

Appreciation for the natural world emerged from the plethora of responses that only considered two relationships involving place: environmental and psychological. These students

were fairly straightforward in their thinking, valuing places for their intrinsic worth or beauty. More often than not, these students implied that humans were a part of nature rather than above it, hence the absence of concern for social relationships. Put differently, these students' conceptions about sense of place boiled down to views and vistas.

The distinct group of students with an economic bend in their thinking tended to share a migratory sense of place from which the experiences theme emerged. These students valued traveling, adventures, and generally experiencing the world. They persistently displayed an awareness of the economic realities of life, seeing finances as integral to their future success and goals. Their ideal sense of place was a transient one, privileging action over settling down. The environment, too, was important but mostly due to its vastness and potential for possibility.

Discussion

The major findings of this research reveal five ways students think about sense of place in the English language arts classroom. There are community oriented thinkers, family focused learners, nature viewers, remembrance minded students, and experience seekers. Further, students demonstrate consistency in their thinking about place over time, between different assignments, and in tandem with different genres of study. The findings also highlight ways that a unit of place-based instruction might expand student thinking to become more holistic and critical.

However, after further analysis, it seems that not all five ways of thinking about place are created equal. Some of the thought patterns treat sense of place as a dynamic concept while others treat it as static. While the dynamic responses support researchers' (Ardoin, 2006; Gruenewald, 2003) attempts to expand definitions of sense of place, the static responses run the risk of supporting narrow and exclusionary narratives (Azano, 2010). For example, the community oriented thinkers and experience seekers in this study had an easier time grasping the social, economic, and environmental relationships that shape the context of daily life. In contrast, the nature viewers and family focused learners had difficulty understanding the complex relationships that determine one's place in the world. These students seemed to favor clean, simplistic understandings of texts and contemporary issues.

Overall, whether or not students who participated in this study expanded their thinking, they did seem to understand the reasons why sense of place is important. Rarely were written responses off the mark entirely, and never did students ask why this topic belonged in an English

class. Teachers who are interested in teaching a place-based unit or focusing specifically on sense of place in the English classroom should first consider the content they wish to teach and look for ways it might relate to local places and politics. These local connections with content can not only enrich instruction and encourage learning outside of the classroom but also help teach sense of place holistically. Understanding how social, political, economic, and environmental forces shape one's sense of place is easier on the community scale. Students are more familiar with their local environment; *place* becomes vividly imaginable.

Finally, place-based instruction should go beyond the classroom in a physical sense. After using sense of place to reflect personally and analyze critically, the next step is to find ways to participate locally. Much like Freire's (1987) notion of action-reflection, students might benefit from participating in their own senses of place rather than merely pondering them. Whether a community garden, documentary of local folk tales, or farm-to-cafeteria initiative, this communal work might reinforce the reciprocal nature of instruction and learning, of theory and practice, of action and reflection. If students possess collective or intimate knowledge of their local environments—and they do, perhaps more often than they realize—then they should be encouraged to get outside of the classroom and follow those senses into the dynamic and infinitely didactic world.

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How Implementing Interactive Geometric Software Affects Students' Achievement, Engagement, and Attitude Towards Mathematics

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Technology is rapidly changing the way the world operates. It is interesting to consider how the rapid integration of technology into the classroom affects students. Currently, a common goal of using technology in mathematics instruction is to allow students to explore the material in ways that support 21st century learning. Consequently, students tend to deepen both their conceptual and procedural knowledge of the content (Kong, 2011). Since teaching with technology is a relatively new method of instruction, when discussing its impact in mathematics classes, it is important to observe how students learn from these interactive technologies. Students can benefit from using technology if instructors utilize the technology effectively. According to the National Council of Teachers of Mathematics Technology Principle (2000, p. 24), "Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning." The NCTM position is that with the responsible use of technology, students can learn mathematics at deeper and higher levels.

In the current study, students used interactive geometric software to create dynamic constructions that extended beyond paper and pencil capabilities. It explored how incorporating interactive geometric software in the high school mathematics classroom affected student achievement, engagement, and attitude towards mathematics.

Literature Review

Technology in education includes the use of a multitude of electronic tools, software, and applications used to help guide learning in K-12 schools (Cheung & Slavin, 2011). Hew and Brush (2007) define technology integration as "the use of computing devices such as desktop computers, laptops, handheld computers, software, or Internet in K-12 schools for instructional purposes" (p. 225). Researchers have found that implementing technology in education has improved student success. Specifically, interactive technology offers students greater opportunities to learn.

In geometry, incorporating technology into instruction is quite common. Hull and Brovey (2004) looked at student achievement using interactive geometric software, specifically, *Geometer's Sketchpad*. The researchers conducted a study on three ninth-grade geometry classes in effort to measure student achievement and attitude towards geometry after using *Geometer's Sketchpad* to learning mathematics in place of traditional lecture-based instruction. The researchers concluded that students using dynamic geometry software performed slightly better than students that were taught using traditional methods.

In 2004, Hannafin investigated students' ability when using *Geometer's Sketchpad* to complete instructional activities. Hannafin looked at how the type of instruction, structured and unstructured, affected student achievement. He defined structured activities as those where teachers used scaffolding abundantly. Contrarily, teachers used scaffolding minimally during unstructured activities. In a sample of 151 seventh-grade students, all were presented with two instructional resources. All students had access to *Geometer's Sketchpad* and a booklet of 14 geometry related activities, each requiring the use of GSP.

Students worked in pairs through the activities. According to Hannafin, "The activities directed students to draw, measure, and manipulate segments, angles, circles, and other geometric shapes using Sketchpad" (2004, p. 23). Hannafin found that low-ability students performed higher in less structured activities, and high- and medium-ability students performed higher in the more structured activities. This provided evidence, according to Hannafin, against achievement separation, which is typical in high school classes. These results suggest that since low-ability students performed well during less structured activities, educators could experiment more with open-ended learning environments in order to lower achievement separation.

O'Donnell's (2011) study focused on students' attitudes towards mathematics. With 31 high school students from regular level geometry classes, she looked at whether or not using *Geometer's Sketchpad* during instruction improved students attitudes about mathematics over an eight-week period. Her students typically learned from lecture based style instruction while using *Geometer's Sketchpad* only sparingly. During this study, O'Donnell used only *Geometer's Sketchpad* for instruction while teaching right triangles and area. She used Sketchpad in two ways. Either the students worked individually with a guided worksheet or she would guide the lesson on Sketchpad. She concluded that, according to the student surveys after the instruction with *Geometer's Sketchpad*, students showed a non-significant, but positive, attitude change

towards mathematics. O'Donnell further claimed that the low-attitude students would start showing more positive attitudes if the study were extended. O'Donnell's narrative journal from the study suggested that students enjoyed using *Geometer's Sketchpad* to learn mathematics. She claimed that during the first week of her study, "students were amazed at how quickly class went by because they were so absorbed in what they were doing" (O'Donnell, 2011, p. 27). Her journal provided similar evidence weekly, thus she concluded that using *Geometer's Sketchpad* improved students attitudes towards mathematics.

Kimmel and Deek (1996) proposed four things that were essential for designing successful classroom lessons. These included quality instruction, good educational design, good pedagogical techniques, and effective instructional technology. The researchers suggested that the combination of these four items provided progression toward successful classrooms of the future. Combining and integrating Kimmel and Deek's four things into one classroom would be a challenge, but definitely a challenge worth pursuing. Teaching high school mathematics is sometimes like trying to sell a product door to door that not everybody wants. The difference with teaching is that the students cannot simply say no and shut the door. The teacher is responsible for delivering his or her product, in this case mathematics, to each student using whatever strategy works best. The strategies that tend to work best are ones in which students are successful and promote positive attitudes. There is evidence here that implementing *Geometer's Sketchpad* into the teaching and learning of mathematics can improve achievement and attitude problems in the mathematics classroom.

Methodology

This action research study investigated how implementing *Geometer's Sketchpad* into learning mathematics influenced student achievement, engagement, and attitude towards mathematics. This study involved twenty students at an urban public high school in the south. The class chosen was an Honors Geometry class. The twenty students in the study were an intact class of freshman and sophomores. The study took place in a classroom containing a mobile computer lab where students worked in pairs during the study and shared one computer per pair.

During the study, geometry students learned about the properties of the seven different quadrilaterals using *Geometer's Sketchpad*. Students then used these properties to answer questions and solve mathematical problems. Post surveys were given to the students after the study to detect how using *Geometer's Sketchpad* to learn mathematics influenced their attitude

towards mathematics. Pre and Post-tests were used to compare levels of achievement in content while using *Geometer's Sketchpad* as an instructional tool.

Results and Conclusions

The students completed individual pre-and post-tests containing material related to the properties of quadrilaterals. The class contained twenty students, but only seventeen returned consent forms and so the data from the other three students was not incorporated into the analysis. Also, two students who had returned consent forms were absent on day one when the pre-test was given. Therefore, no pre-test score was available for these students. The point value of each question was the same for each question in the pre-and post-test. The only difference in the two tests was that in the pre-test the definition section was open-ended and on the post-test it was fill in the blank.

Fourteen of the fifteen students improved their scores from the pre-test to the post-test. The one student who did not show improvement actually scored the same on both tests. Using the fifteen pre-test scores available, the mean grade of the pre-test was a 60.9. Again, only using the fifteen viable post-test scores, the mean grade was a 74.2. While the sample size is not large enough to use inferential statistics, the test results show growth in the students' scores from the pre-test to the post-test.

An attitude/engagement survey was given to all twenty students on the final day of the study. The researcher developed the survey and a group of qualified teachers at Wake Forest University validated it. The purpose of the survey was to determine students' attitudes towards mathematics after using *Geometer's Sketchpad*. The survey consisted of 10 statements/questions including yes or no responses, Likert Scale items, and open-ended responses.

The first question on the survey asked students whether they enjoyed using *Geometer's Sketchpad*. Of the seventeen students, ten said *Yes* they enjoyed using *Geometer's Sketchpad* and seven claimed *No* that they did not like *Geometer's Sketchpad*.

The open-end questions provided a more in-depth look into students' attitudes towards mathematics. Question 8 asked students to explain how using *Geometer's Sketchpad* affected how they felt about learning mathematics. What is good or bad? Some common themes arising from students who said *good* include the visual aspect the technology provides, how easy it is to measure shapes, provides fast results, and provides a better understanding. Themes from those students who felt *Geometer's Sketchpad* affected how they felt about learning mathematics in no

way or a bad way made statements about being impatient with computers or how they learned better by writing by hand.

Question 9 asked students what they liked most about using *Geometer's Sketchpad* in learning mathematics. Students commented on how it challenged them to try new things, it is hands on, do-it yourself approach, gave measurements that were exact, and that it was easier because it was on the computer. Question 10 was the reverse of question 9 in asking students what they did not like about using *Geometer's Sketchpad* in learning mathematics. Common responses included students having issues with using *Geometer's Sketchpad's* features. For example, many students seemed to be frustrated simply constructing a quadrilateral using the programs "segment" feature. In addition, students commented on how sensitive the program was when they were trying to measure sides or angles. One particular student stated, "No matter what, I will always hate mathematics, but using a computer to solve math is always more enjoyable than using paper." Based on this student's response, it seems using computers to learn mathematics could potentially boost students' attitudes towards mathematics.

Discussion

This study investigated whether using *Geometer's Sketchpad* improved student achievement, attitude and engagement towards mathematics. Did the use of dynamic geometric software, such as *Geometer's Sketchpad*, influence student achievement, attitude, and engagement towards mathematics? This research question was answered by pre-and post-tests, surveys, and classroom observations. The pre-and post-tests indicated that *Geometer's Sketchpad* was useful in showing improvement in student achievement. Every student but one (who essentially scored the exact same) showed improvement in their scores from the pre-test to the post-test.

The survey provided additional information towards whether students' attitudes improved because of using *Geometer's Sketchpad*. There was a distinct connection between the responses of students who enjoyed using *Geometer's Sketchpad* and those who did not. Those who liked using *Geometer's Sketchpad* tended to mention how helpful it was to their understanding of the mathematics. These students also noted many positive aspects of the program, so these students did show improvement in their attitude towards mathematics. The students who did not like using the program generally made it clear through other responses on the survey of why. It is not

clear if using *Geometer's Sketchpad* improved their attitude towards mathematics, however these students did not show a positive attitude towards the program.

This study explored whether students' achievement, attitude and engagement levels towards mathematics improved as a result of learning through *Geometer's Sketchpad*. The results of the pre-and post-tests indicated that *Geometer's Sketchpad* improved students' achievement levels. In addition, the survey provided mixed evidence of *Geometer's Sketchpad* having positive effects on students' attitude and engagement of mathematics. *Geometer's Sketchpad* is recommended for classroom use because the program has many excellent qualities for helping students learn, understand, and enjoy mathematics.

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