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**The Development of Cultural Awareness for Communicative Ability in the
Secondary Spanish Classroom**

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The field of foreign language education has experienced transformation over the past few decades due to the increasing diversity of the population of the United States and the global interaction found in multiple facets of society. While language learning and oral proficiency have historically been emphasized as the major objectives in the study of foreign languages, the interaction between language and culture and its impact on the communicative functioning of society has gained importance in the foreign language classroom (Yamada & Moeller, 2001). The *Standards for Foreign Language Learning* were created and implemented with the notion of connectivity between culture and language (ACTFL, 1996). The development of cultural awareness is a vital goal for the foreign language classroom, as it includes learning about different elements of the target culture, while communicating effectively with this information at hand. The ability to communicate across cultural perspectives is a key objective in foreign language education, while only possible as students gain increasing knowledge in the area of culture.

Review of Literature

With the creation of the national foreign language standards, there has been an ideological shift in how language educators think about culture, modifying instructional design to focus specifically on the products, practices, and perspectives of the target culture (ACTFL, 1996). Foreign language educators have moved away from an approach that once considered cultural knowledge as a separate skill to the current approach that weaves culture into other aspects of foreign language learning. The *Standards for Foreign Language Learning* state that communicative language development includes grammatical and linguistic competence that is supported by the "complexity of the interaction between language and culture" (Yamada & Moeller, 2001, p.26).

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Grammar is not the only skill that creates effective communication, but as stated in the *Performance Guidelines* (1998), cultural awareness is also an important component. Castro, Sercu, and Del Carmen (2004) define intercultural competence, similar to cultural awareness, as "the ability of a person to behave adequately in a flexible manner when confronted with actions, attitudes and expectations of representatives of foreign cultures" (p.92) and consider it an important product of the shift in foreign language education. As they have researched foreign language teachers' ideas about foreign language education, they primarily see educators who perceive the linguistic components of foreign language education to be more important than the cultural components (Castro, Sercu & Del Carmen, 2004). This finding suggests that the field of foreign language education should continue to work with teachers' perceptions and ideas about foreign language education such that the integration of language and culture can become a reality.

This paradigm shift in thinking about the development of cultural knowledge is supported by those who promote the process approach in learning culture. Storme and Derakhshani (2002) and Schulz (2007) advocate for the process of learning culture, since culture is not a static set of facts, but rather a dynamic and developing aspect of humanity that requires a learner's cognitive, behavioral, and affective dimensions in order to comprehend and apply it. Because of increased diversity, mobility, and intercultural contacts, it is better to "promote the learners' cultural skills than to transmit cultural knowledge" so that students can be individually responsible for the exploration of emerging cultural information (Sercu, Del Carmen, Prieto, 2005, p. 484). When foreign language students are successfully instructed in these various dimensions, the goal of cultural proficiency becomes an attainable ability that is useful in today's pluralistic society (Jernigan & Moore, 1997).

After students form a base of cultural knowledge, Savignon and Sysoyev (2005) suggest communicative strategies that can guide students to be able to explore and compare cultures. They argue that by explicitly teaching these sociocultural strategies for communication, foreign language teachers can prepare students for "interaction with unfamiliar cultures in unpredictable communicative situations" (Savignon & Sysoyev, 2005, p. 361).

By defining proficiency in a foreign language as being able to effectively communicate in various situations, the importance of cultural knowledge and awareness in the foreign language becomes extremely important. The purpose of this study was two-fold. First, it investigated instructional strategies and resources used in the secondary Spanish classroom to enhance students' cultural knowledge and communicative ability. Secondly, the study investigated how teachers consider and use the national foreign language standards and the *ACTFL Performance Guidelines* to design instruction that integrates cultural awareness into the foreign language curriculum.

Methodology

This research study took place between September and December 2008 in a public school district in central North Carolina. The participants were ten secondary Spanish teachers were purposefully selected for their master teacher status of through recommendation of the researcher's advisor. Using a researcher-created instrument, the researcher interviewed the participants to obtain data on teachers' thoughts regarding teaching cultural knowledge to develop students' cultural awareness. Secondly, eight participants were chosen for classroom observations in which the researcher took focused field notes on the methods used by the Spanish teacher to teach the target culture. Using interview notes, audio recordings of the interviews, and field notes of classroom observations, the researcher reported on the instructional practices used by Spanish teachers to help develop cultural knowledge that leads to culturally-aware students with the ability to effectively communicate in this global society.

Discussion and Conclusion

The following discussion of the interview and observation results attends to and synthesizes all information gathered during the research process. All of the teachers expressed familiarity with the *National Standards* and *Performance Guidelines*. Through further questioning, it was apparent that the teachers do not use these resources consistently, as some keep the *Standards* and *Guidelines* in mind in planning every lesson and others refer to these documents once every year.

Most teachers' primary goals are similar as they all expect their students to gain communicative ability in their classes. The teachers of lower levels of Spanish, although responding within the theme of communication, did collectively speak about their goals

to develop a good foundation and appreciation for language. Teachers of higher levels of Spanish referred to communication in terms of a foreign language learner's ease in using the language and the effectiveness of communication.

Teachers in the field defined both culture and cultural awareness in similar ways, using the three P's paradigm of products, practices, and perspectives to frame their ideas of each. The teachers gave a variety of answers as they discussed what the expectations are for their students as far as their development of cultural awareness. While most teachers want their students to develop an appreciation and respect for cultural differences around the world, some teachers stated their expectations in terms of the knowledge gained and used during the assessment of target cultures. According to responses, the acquisition and use of cultural knowledge as well as the aspect of respect and openness to differences completes the whole picture of cultural awareness, while the teachers' expectations may not have included both of these critical elements. During research observations, similar discrepancies were observed as some teachers led their students into a discussion about cultural practices and perspectives, while other lessons included instruction of culture that was aimed at informing students' cultural knowledge.

In terms of approaches to teaching culture, research emphasizes the integration of culture in all foreign language activities such that it could be used in any communicative task. When asked what role the Cultures Goal plays in integrating the Five C's in Spanish instruction, all teachers said that culture is found in the other standards and is the connecting element. When they reflected on how they actually integrate culture into their classes, it seems that their instructional practices may not always follow practices of integration throughout the curriculum. For high school teachers to develop activities with cultural knowledge integrated into it may be a more difficult task than it first appears. Many teachers are committed to integrating cultural information into their lessons because they see how the cultural element attracts and keeps the attention of their students. Instruction of culture also opens up a new opportunity for involvement and leadership in the classroom for native speakers of the target language. While this may be true, it may be difficult to find a cultural connection to every grammatical concept.

Not only does research in the foreign language field encourage the integration of culture in the foreign language curriculum, it also argues that without cultural knowledge,

communication is inauthentic, since language is rooted in the culture of a group of people. While many teachers in this study recognize that authentic communication enhances cultural knowledge and awareness and vice versa, it seemed to be complicated for participants to explain why the development of these two components of the Spanish curriculum have a positive effect on each other and what the deep connection is that binds communication and culture together. There is good evidence that teachers in this research study intend to in include culture in their lessons in an integrated fashion, and if it is believed that communication and culture go hand in hand in learning a language, integration of cultural awareness into communication likely occurs. A few of the authentic communicative tasks are used by a few teachers, including role plays, class discussions, and cultural presentations, revealing that there is an effort to integrate authentic communication and culture. Infusing Spanish classrooms with other forms of culturally-integrated communicative tasks would be beneficial to the foreign language field as it is evident that communication without authenticity may still be used in Spanish classrooms.

The final salient trend that emerged from interviews and observations was the use of higher-order thinking skills in the development and use of cultural knowledge in communicative tasks. The majority of teachers responded in the interview that the development of cultural knowledge and awareness requires higher-order thinking skills and that their students are expected to go beyond memorization of cultural facts. Most teachers want their students to recognize otherness as a positive aspect of a diverse world and to respect these differences. To respect diversity, it is important that students learn to ask "why" so that they can understand how and why things are different in other cultures. Teachers also see the creative and constructive abilities of students as they analyze cultural information, because students have to add their previous knowledge to create new schemas that accommodate for new information that is distinct from their own cultural experiences.

In conclusion, it is important that teachers work towards the development of cultural knowledge and awareness in students and connect this to students' ability in effective communication. As the world is increasingly connected through business markets, military operations, service opportunities, and increased human mobility, 21st

century teachers should prepare their students to be able to communicate in culturally diverse areas of the world, including the United States. Twenty-first century curriculums not only focus on technological advances, mathematics, and sciences, but authentic and effective communication as it is a necessary outcome of this century's education system. By using student interest in culture and understanding the inextricable bond between culture and language, Spanish instruction can exist in an integrated fashion. As the standards movement continues to guide foreign language education, the Five C's of Communication, Cultures, Connections, Comparison, and Communities can lead to positive outcomes in foreign language programs as all aspects of language are integrated in the development of proficiency.

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Writing Use in the Mathematics Classroom

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Traditionally, instructional endeavors in the mathematics classroom have included computational homework assignments, lists of formulas, and strict grading rubrics. Students take notes, work practice problems, and then perform on assessments. With the sound leadership of groups such as the National Council of Teachers of Mathematics (NCTM), educational movements are calling teachers to reflect on their practices and use a variety of instructional methods. One of the recommendations at the forefront of this reform is the use of writing in the mathematics classroom.

Content area writing is not a new idea. Writing across the curriculum has historical roots in the progressive ideas of John Dewey and his colleagues (Yates, 1987, p. 6). It also has theoretical foundations in Howard Gardner's concept of multiple intelligences (Huetinck & Munshin, 2008). Written communication in mathematics is one of the "different avenues teachers can employ to help students tap into their unique strengths to learn mathematics" (Huetinck & Munshin, 2008, p. 48).

While the topic of content area writing has theoretical basis and it has ties back to the Progressive movement of the 20th Century, it has resurfaced in recent years as an important educational objective. Specific to the mathematics classroom, writing has gained attention because of its function in diversifying instructional strategies and allowing students to construct their own meaning of the material. It has been praised as a tool for both students and teachers. With the charge from the National Council of Teachers of Mathematics to incorporate writing, mathematics teachers are asked to adapt their instructional methods so that writing is an integral component of their subject. Student journals are one form of mathematical writing that teachers have employed in their classrooms. Other writing assignments may include creative writing projects (Halpern & Halpern, 2005) or poems (LaBonty & Danielson, 2004).

Research suggests that, when engaged in writing in mathematics, students experience numerous benefits. While writing can promote higher level thinking and greater mathematical vocabulary, its universality also makes writing a tool for reaching diverse populations of students. Research experiments have proven that low-achieving students, introverted students, and English language learners (ELLs) can express their mathematical competencies through written assignments. Although low-achieving students may play the role of a passive observer in class conversations, they can be more proactive in their writing. Writing is not only a tool for learning, but an outlet for low-achieving students and introverted students to participate in considering various mathematical concepts. ELL students can "learn a new language and mathematics more effectively when they write to communicate what they are learning" (Winsor, 2007, p. 373). Students may begin by writing in their native language, and then, with their teacher's guidance, they may progress to using mathematical vocabulary in English.

In addition to facilitating student learning, content area writing is also an effective instructional tool. Writing proves to be an invaluable resource to teachers, as it creates a connection between them and their students (Goldsby & Cozza, 2002). It provides informal communication between the two parties, and it serves to better the education that the students receive. The pedagogical efficacy of writing lies in the teacher's critical evaluation of the student writing to deduce its meaning and its reflection upon student comprehension. There are many influences student writing may have on teacher instruction; teachers may choose to

> (a) immediately reteach a lesson or concept, (b) delay an assessment because of lack of understanding…(c) schedule a revision based upon what was learned from the students' writings, (d) initiate private discussions with students who [had] mathematical misconceptions, and (e) use writing prompts on assessments (Miller, 1992, p. 7).

By assessing students via writing and then reflecting on their teaching practices, teachers can direct their upcoming lessons, correct misconceptions, and modify their instruction for each individual student.

While there seems to be substantial support for the use of writing as an instructional tool, there is also a body of research that details the inconsistency of which writing is implemented in practice. Little and infrequent writing is characteristic of many

mathematics classrooms (Ntenza, 2006). Even within the same school, the frequency for using writing varies among individual teachers. To explain the inconsistency and frequency of writing in the math classroom, researchers have discovered that many factors may interfere with the goals for writing. When developing their plan for writing in mathematics, teachers may encounter such obstacles as: students' writing inadequacies, student attitudes toward writing, contextual factors, time concerns, and lack of training.

In light of the substantial research in support of writing in the mathematics classroom and the counterevidence on the obstacles against its implementation, the researcher was interested in understanding this divide between theory and practice. This study sought to explore the following question: In what ways and for what purposes do secondary mathematics teachers integrate writing into their curriculum? The researcher hoped to gain insight into what writing practices were already in place in the classroom. Another question that guided this study was: What are teachers' beliefs concerning the use of writing in the teaching of mathematics? The study sought to describe the current conditions of writing use in the high school mathematics classroom.

Methods

The study was conducted in a diverse public school system in North Carolina. The school system consists of ten high schools and approximately 100 secondary mathematics teachers. Data was collected via survey. An online survey tool (*Google Docs*) was used in creating and distributing the questionnaires. The secondary mathematics teachers received an email invitation explaining the objectives of the study and directing them to the Internet link for the survey. Those teachers who chose to participate in the study voluntarily completed the survey. The identity of the participants remained anonymous throughout the duration of the study. After receiving an email invitation and a reminder email, twenty-four teachers chose to participate.

On the surveys, the teachers were asked to indicate the specific courses they teach and their number of years of experience in the classroom. The survey asked the teachers to respond to questions about the types of writing exercises they used in their classroom and the frequency with which they implemented the writing. The teachers were also

asked to detail their most memorable experiences of writing in the math classroom and their beliefs on using writing in their teaching.

After collecting data via the online survey, the researcher analyzed the responses on the surveys and calculated percentages based on the responses. The researcher used the percentages to summarize the findings of the study. The researcher also summarized the narrative data from the open-ended questions through a process of coding.

Results and Implications

Teacher reports of the amount of writing in their classrooms revealed that writing is not widely used. Use of different types of writing was varied. See Table 1.

Table 1. Types of Writing in the Mathematics Classroom and Frequency of Implementation

	Never (less than once or twice a month)	Sometimes (once or twice a month)	Often (at least once a week)
Understanding	25% (6)	62.5% (15)	12.5% (3)
Feelings or Attitudes	66.7% (16)	33.3% (8)	0% (0)
Mathematical Word Problems	33.3% (8)	54.2% (13)	12.5% (3)
Creative Topics	87.5% (21)	12.5% (3)	0% (0)
Explanations	45.8% (11)	41.7% (10)	12.5% (3)
Solutions to Mathematical Problems	33.3% (8)	33.3% (8)	33.3% (8)

Creative writing was the least frequently implemented type of writing in the mathematics classrooms. Of the teachers participating in the study, 87.5% reported that they never have their students engage in creative writing exercises. The most frequent type of writing was that which required students to write explanations to mathematical problems. Although this was the most frequent type of writing, the percentage of teachers using this type of writing was low. Only one-third of the teachers reported using this type in their classroom at least once a week. Overall, teachers report that writing (affective, expository, and creative) is infrequently implemented in the math classroom.

Teachers were asked their beliefs concerning the use of writing in the teaching of mathematics. In contradiction with the little amount of writing that takes place in the classroom, many teachers responded positively, saying writing is a "very powerful teaching and learning tool" (Teacher A). Many teachers acknowledged writing as relevant and "critical" (Teacher B) to the mathematics classroom. They believed that

"writing should be a major component of any mathematics course" (Teacher C). Teachers said the process of writing aids students in understanding the concepts better and reaching a deeper level of understanding. One teacher said that students "need to be able to express why they understand a problem and not just be able to give a numerical answer" (Teacher D). Similarly another teacher stated that writing is necessary for developing meaning in the context of real-life applications. The teachers also identified writing as valuable in assessing student understanding. It can serve as an "excellent feedback tool for the teacher to see what the kids understand" (Teacher E).

In explanation of the infrequent use of writing in their classroom, the teachers expressed frustrations about time constraints. Limited class time restricts teachers from engaging their students in writing. Veteran teachers with up to thirty years of experience and beginner teachers with less than five years of experience feel "rushed to get the concepts covered" (Teacher G) and "have a hard enough time just teaching the [basic] mathematical steps/processes" (Teacher H). Specifically, in reference to affective writing, one teacher said: "I usually do not have the time for students to write about their feelings toward math" (Teacher H). Many teachers feel pressure to cover the material and adhere to the "rigorous pacing guide" (Teacher I). They find it "difficult to manage all of the required material in addition to writing assignments" (Teacher J). The teachers seemed to understand writing as an additional task on top of their existing course load.

In addition to time constraints, the teachers believed their use of writing related to the level of their students. For instance, students in Advanced Placement Calculus are required to write to justify their answers on free-response test questions. However, in standard level mathematics courses, content area writing can be increasingly more difficult, especially for students that have "very low reading/writing skills" (Teacher C).

With time constraints and other pressures, teachers are searching for practical ways to bring writing into their classroom. Written corrections for tests and quizzes are one example recommended for incorporating writing without taking away from class time. One additional writing activity that can be easily implemented in the mathematics classroom is "having students write where they 'got stuck' on assigned problems" (Buerk, 1994, p. 25). To receive credit for a homework assignment, students must do every problem or write one or two sentences explaining where they had difficulty. This

exercise in writing would give more value to homework assignments. The students would be accountable for their understanding of the material, and the teacher could identify with how each individual student solves a problem.

Writing in the mathematics classroom is an important goal of the National Council of Teachers of Mathematics. While research supports writing as a tool to facilitate learning, diversify instruction, and provide assessment, the results of this study indicate that it is infrequently used in the high school mathematics classroom. Students of these teachers seldom write about their understanding of mathematics or write creatively about mathematics. The amount of writing varies among teachers; however, the majority of students write less than once or twice a month in their mathematics courses. In addition to the different ability levels of students, teachers reported that pressure from time constraints and pacing guides influence their incorporation of writing inside and outside of the classroom. The results of this study do not follow the recommendations of NCTM. Communication is "an essential part of mathematics and mathematics education" (NCTM, 2000, p. 60), and "written communication should be nurtured" (p. 60). In the mathematics classroom, writing should be a trademark of the teacher's instruction and the student's learning experience.

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The How of Homework: Assignment Methods and Student Engagement

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Regardless of how one may *feel* about the tradition of teachers assigning homework, one must recognize that it is a widely accepted method of knowledge retention in the classroom, and therefore, a force to be reckoned with. This study aimed to look not at *what* type of homework is assigned, but at *how* said homework is assigned. By studying how teachers assign homework, as well as how engaged students seem to be at the time of initial assignment, one aims to find a specific method of assignment that encourages the most student engagement and therefore increases the likelihood that students will complete the homework assignment. The question that this study seeks to answer is, "Which methods of homework assignment produce the most student engagement at the particular time of homework assignment?"

Review of Literature

"Homework is a time honored strategy for developing learning skills and reinforcing knowledge gained within the classroom" (Simpilicio, 2005, p. 138). This sentiment is found throughout many articles concerning the nature of homework and is usually accompanied by an acknowledgment that the practice of assigning homework, although in many cases flawed, is not going away any time soon. One of the most celebrated advantages of homework "is that it can enhance achievement by extending learning beyond the school day" (Marazano & Pickering, 2007, p. 76), no matter how much students may protest said extension. It is viewed by many teachers as a necessary evil. Because homework is used to reinforce concepts and ideas taught in the classroom, it plays an integral role in the process of the students' attainment of knowledge. Columbia (2001) strongly advocates that "a clear message needs to be conveyed to students that the responsibility to do the homework is the same as the responsibility to work in class" (p. 373). Heitzmann (1998) similarly charges that teachers must "honor

the belief that homework, because of its ability to make a major contribution to the learning process, deserves serious attention" (p. 53).

With the role that homework plays in overall learning established, one can then move on to the way that homework should be implemented in the classroom. Heitzmann (2007) implores teachers to "explain the out-of-class activity in detail ensuring that students have sufficient tools to complete the assignment" (p. 43), while Kohn (2007) suggests that we "ask the kids" what they think about homework. Is it useful? Are some types of homework better than others? How does homework affect your desire to learn? (Ask the kids ¶ 16)

Simply assigning homework without any deliberate forethought is not enough. The particular way that homework is assigned can communicate to students very powerful messages about teacher expectations and how they value, or do not value the assignment. The way that teachers handle, explore, assign, and collect homework does not go unnoticed by students. It affects the way that they, in turn, handle, explore, and eventually do or do not complete their homework assignment. The way that teachers assign homework has the ability to affect how engaged students will be with that particular homework assignment, and "engaged students are more likely to learn the knowledge and skills that schools have to offer" (Nystrand & Gamoran, 1989, p. 4).

While markers of engagement may be "sundry, ambiguous, and elusive" (Nystrand & Gamoran, 1989, p. 7), they are not wholly impossible to identify in students' actions and reactions to homework. When students are engaged, they are much more likely to feel a personal interest or connection with the assignment and be much more likely to actually complete it. Dodd (1995) explains that "effective teachers know that to become engaged, students must have some feelings of *ownership* (emphasis in original text) ---- of the class or the task ---- and *personal power* (emphasis in original text) ---- a belief that what they do will make a difference" (p.65). Other researchers find that engagement may show itself in student's paying close attention for an extended period of time, or something much more subtle, like a twinkle in a student's eye (Nystrand & Gamoran, 1989).

By exploring how teachers assign homework coupled with how their methods affect student engagement at the time of assignment, the methods that foster the most engagement, and therefore chance of actual completion, will hopefully come to light.

Methodology

This was a non-participatory, observational, qualitative and quantitative study. The subjects were four English teachers and their students at a secondary school in Winston-Salem, North Carolina, in the Forsyth County school district. These four teachers were purposefully selected by the primary investigator based on their previous experience working with the Master Teacher Fellow's Program at Wake Forest University. The students were in grades nine through twelve and were in classes of varying ability level. Class size varied from 10-35 students. Teachers were identified in this study as teacher A, B, C, or D, and there was no identification of students.

Eight class periods of each of the four teachers were observed, totaling 32 class observations. Two distinct classroom acts were observed and categorized: teacher's method of homework assignment and student engagement at the time of homework assignment. A self-created evaluation form was used to distinguish different methods of homework assignment used by each teacher. Also, a self-created evaluation form was used to measure student engagement at the time of homework assignment, using a tally system. One piece of paper, which included both evaluation forms (Method of Homework Assignment and Student Engagement at Time of Homework Assignment) was filled out for each of the 32 class periods observed.

Results and Conclusions

Twenty of the thirty-two observed classes had no homework assigned at all. The methods of homework assignment in the remaining twelve classes fell into two distinct methods of assignment: a) homework was assigned only verbally with either no explanation or a brief explanation, and always at the end of the class period, or b) homework was assigned both verbally and visually with a brief or thorough explanation, at the beginning, middle, or end of the class period.

Markers for student engagement in each category are as follows: the seven classes where homework was assigned only verbally had nineteen instances of a clarification question asked to a teacher, three instances of a clarification question asked to a peer,

three instances of the assignment written down, zero instances of audible excitement, and five instances of audible dissatisfaction. The five classes where homework was assigned both verbally and visually had twenty-one instances of a clarification question asked to a teacher, three instances of a clarification question asked to a peer, forty-two instances of the assignment written down, three instances of audible excitement, and zero instances of audible dissatisfaction.

In the classes where homework was assigned only verbally it was always done so at the end of the class period, anywhere from three minutes prior to the bell ringing, or immediately after the bell had rung. This method did not allow the teacher sufficient time to explain the assignment to the students. The students may have also felt that their need to get to their next class was more pressing than writing down their homework assignment or consulting for a longer period of time with their teacher or peers.

In the classes where homework was assigned verbally and visually, the assigning was done at the beginning, middle, or end of the class period. Assigning homework at the beginning and in the middle of the class period allowed teachers more time to explain the assignment and give thoughtful answers to any questions students may had. Students had time to write down the assignment and did not feel rushed. Also, by assigning homework at the beginning and middle of the class period, teachers were able to more clearly communicate to students the relationship between the work that was being done in class and the homework that was being assigned.

The only marked difference between the two groups was with the student engagement marker of writing down the assignment. When homework was assigned both verbally and visually, sixty-one percent of the students observed wrote down the homework assignment, compared with only ten-percent when homework was assigned only verbally (see figure 1). One may conclude that assigning homework using the verbal and visual method at the beginning or middle of the class period, combined with a minimum to thorough explanation produces the most student engagement. If teachers present information to students in more than one medium they will be more effective at communicating with the many types of learners in their classroom. Using a variety of methods to communicate assignments to students, along with detailed instruction and

explanation of the assignment is the most effective way to assign homework; this method produces the most student engagement and interest at the time of the assignment.
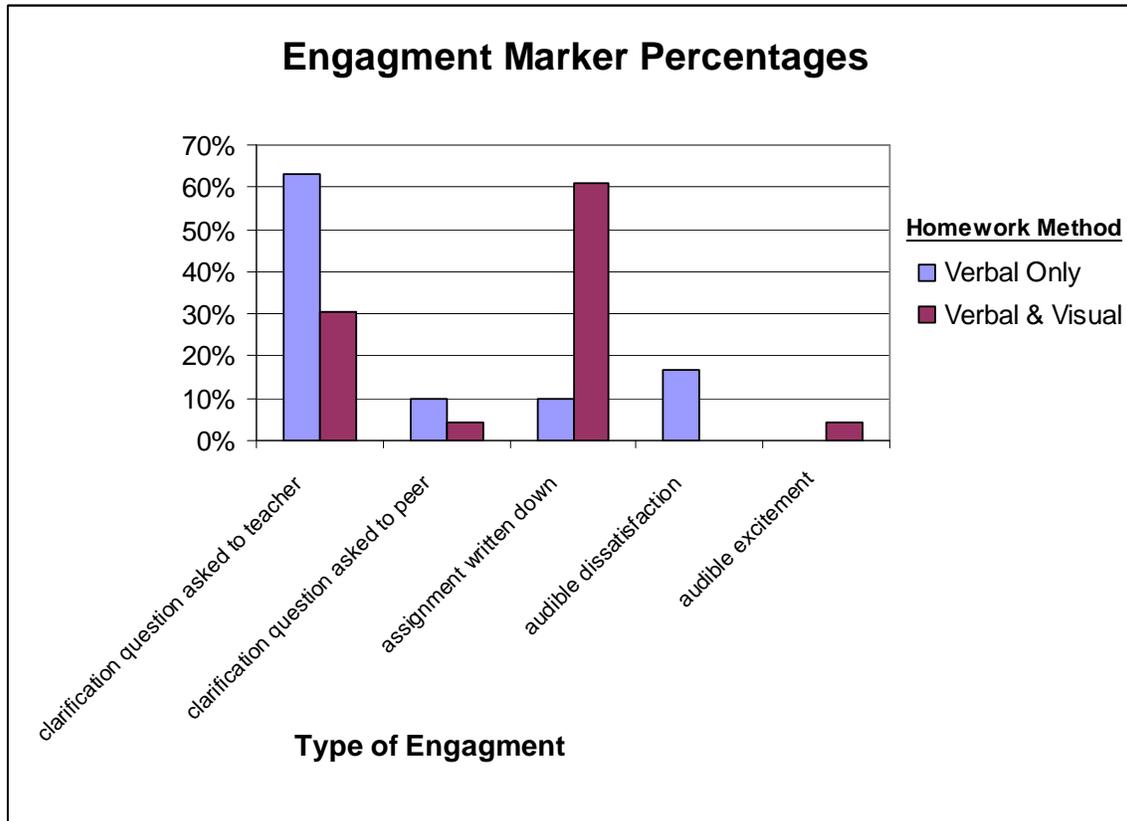
Figure 1

FUTURE STUDIES

In the future, a much more in-depth study with long-term, consecutive observations of teacher assignment methods and student engagement could yield tremendously useful findings. The first extension of this study should include whether or not the students actually complete the homework assignment. Questioning the students as to why they did or did not complete the assignment and inquiring whether the teacher's method of assignment had anything to do with their choice should be included in such a study. It would also be useful to interview teachers and question them as to what they believe their homework assigning method to be, if they have one at all. There are often discrepancies between what people believe they are doing and what they are observed doing. Clarifying these discrepancies can lead to more deliberate and effective

communication between teachers and students. As long as teachers continue to assign homework and expect students to complete it, there will continue to be a need for this type of study.

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Current Events and the Classroom: An Investigation into Teachers' Integration of Current Events in the Secondary Social Studies Classroom

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Few would disagree with the assertion that studying current events in social studies classrooms is important. Current events can be an important tool in not only teaching social studies content but also in instructing 21st Century Skills such as civic literacy, life-long learning, and global awareness. Students are likely to find current events interesting and relevant and are thus drawn into a greater understanding of the content and course objectives. This research study moves beyond the idea that current events are an important aspect of social studies and investigates how secondary social studies teachers actually integrate them into their classrooms. Due to the pressures and constraints associated with statewide standard course of studies and end of course testing, teachers must carefully discern how much time they can afford to spend covering current events and how to make that instruction effective in meeting their objectives (Haas & Laughlin, 2000; Pescatore, 2007). Undoubtedly, this process and practice is unique to every teacher. The results of this investigation will continue to inform prospective and current teachers on best practices to use with current events in their own social studies classrooms.

Literature Review

Educational researchers and practitioners considering this issue argue that current events instruction can and should be used to achieve five key goals: to engage students, to draw a student into a deeper understanding of the curriculum, to develop critical thinking skills, to learn appropriate behavior in discussing controversial issues, and to teach democratic behavior (Clarke & Zelinski, 1992; Haas & Laughlin, 2000; Pescatore, 2007; Sperry, 2006; Turner, 2000). Understanding these goals and theories promoting

current events instruction lays the groundwork for analyzing and evaluating teachers' actual practices in integrating current events into social studies classrooms.

Based on the results of a teacher survey on how current event instruction typically occurs, Haas and Laughlin (2000) report that ninety-five percent of socials studies teachers felt a strong obligation towards including current events in their classroom instruction, with almost all respondents reporting that they teach current event issues at least once a week (Haas & Laughlin, 2000). Teachers in Haas and Laughlin's (2000) study pointed to the lack of time and pressure of national standards as limitations in covering current events. Pescatore (2007) cites the No Child Left Behind Act as a stumbling block to the inclusion of current events instruction. Due to the fact that standardized tests focus on facts, not including current events knowledge or higher order thinking skills that current events analysis provides, teachers devote most of their time to teaching students what they need to know in order to succeed on the test. McEnaney (1997) concludes that, at best, current events actually play only a minor role in the social studies classroom. Turner (1995) agrees with McEnaney and writes that the attention given to current events by teachers is "incidental and infrequent," (p.2).

Turner (1995) cites four techniques commonly used to help students learn about current events:

1. Students select current events as homework and report on these events in class…
2. A single news source is studied and discussed, usually in class…
3. Teacher-selected current events materials are presented to the class in some format in which students either read or look and listen. Students are held accountable by tests and review mechanisms.
4. Using newspapers and other media, students study current events in structured, in-class activities, either individually or in groups. (p. 3)

Turner (1995) goes on to make the point that current events instruction will experience the most success when students are engaged in active, multi-sensory learning, rather than passive learning. He suggests examples such as mock trials, reenactments, debates, and creating and conducting over the traditional oral report on an event delivered by a student or teacher (Turner, 1995).

This groundwork underscores the importance of understanding the theory and practices of integrating current events into the secondary social studies classroom. This study will have as its central research question how five social studies teachers integrate current events into their classroom.

Methodology

The first task of this study was to administer an online survey through *Survey Monkey* to all high school social studies teachers in the Winston-Salem/Forsyth County school district. The teachers selected to interview and observe were based on the results of the surveys. Out of the responders who indicated willingness to participate as well as reporting a frequent use of current events, five teachers, Mr. Kensick, Mr.Matthews, Mr. Richards, Ms. Russell, and Ms. Smith, representing World History, Civics, and US History were selected for the second and third tasks of the study. Please note that each of the names of each of the aforementioned teachers are pseudonyms.

Once the subjects were identified, the researcher conducted structured interviews with each teacher about their use of current events. The third and final task of this study consisted of the researcher collecting field notes while performing non-participants observations of two class periods of each of the five teachers. The researcher observed one honors class and one standard class to watch for any observable differences in how teachers addressed current events at the different levels or how students at different levels reacted to current events instruction.

Results

Several notable themes emerged from the survey, interview, and observation data collection process. First, the five social studies teachers in this study all agreed that current events play an important role in social studies education. Mr. Matthews, a world history explained,

> I don't think there is anything more important than current events. The biggest reason we study the past is to put contemporary events in historical perspective…[History] is only relevant to students if they in some way can relate it to their contemporary experiences. Social studies is not their

number one priority in life. As a teacher, if you don't have
a student's interest then it's impossible to teach.

Moreover, all the teachers in the study admitted that the North Carolina Standard Course of Study plays a role in the extent and manner in which they are able to integrate current events. Mr. Kensick stated,

 The US History EOC is one of the toughest [exams]
students take. Current events are absolutely necessary to
help kids learn and retain. But there is a danger in going to
far in covering them because you loose time that you need
to use to be covering the NCSCOC. Sometimes I'm
willing to take that hit, but definitely not everyday.

Ms. Russell and Ms. Smith, both Civics teachers a less restricted by the NCSCOS in terms of current events instruction because of the fact that "civics and economics are in the news everyday" and that the "goals for the (Civics and Economics) SCOS ask students to look at things then and now." Ms. Russell explained that she "gears coverage of current events towards the objectives."

Another important point uncovered by this study is that teachers use both overt and covert techniques to integrate current events into their lesson plans. Overt techniques are instructional techniques that support the exploration and comprehension of current events such as a Current Events Day, a quiz on a current event homework assignment such as watching the presidential debate or journal assignments. Covert techniques are instructional techniques that use current events to support or explain the main concepts of the course, such as projects or integration of current events into discussions or lectures.

Finally, some teachers interviewed noticed an observable difference in how honors students responded to current events construction versus standard students. Ms. Russell had this to say about the differences in honors and standard students when it came to discussion of current events, "Seminar students tend to like it a lot. The lower level students are generally not as aware. It has to be a really big event. I just don't have as much participation from them." An observable difference between honors and standard students' discussion quality arose when students had to explain their opinion or reasoning for why they felt a certain way about a topic. Honors students were more

likely to accompany their opinions with an explanation and supporting evidence without having to be prompted for such an explanation by the teacher.

Discussion

Between the literature and the data collected in this study, using current events to gain students' interest and to make material relevant are the most frequently cited reasons for integrating current events in the social studies classroom. Just as the scholarship suggests, this research study confirms that teachers are affected by the NCSCOS and the pressures associated with EOC testing thanks to No Child Left Behind (Friedman, 2006; Haas & Laughlin, 2000; Sperry, 2006). However, Civics teachers feel that they are more able to sync current events instruction with the NCSCOS than US History teachers. This comes with little surprise when one considers how the Civics and Economics NCSCOS is mostly based upon learning principles that are played out and observable in everyday life and current events.

This study demonstrates that current events can be integrated in an overt manner where the primary goal of the instruction is to learn about and understand the specific current event being covered or a covert manner in which the primary goal of the current events instruction is to support and further understanding of another class objective with full comprehension of the current event is secondary. On many occasions when teachers integrated current events into their instruction, they did so with both goals in mind.

The teachers participating in this study replicated three of the four techniques that Turner (1995) cited for being common ways to help students learn about current events. Below is a chart describing how those three techniques were carried out by teachers participating in this study.

Turner's (1995) Techniques	Teachers' Application of Techniques
1. Students select current events as homework and report on these events in class.	**1.** Ms. Russell's class watches presidential debate for homework and discusses the debate the next day in class.
2. Teacher-selected current events materials are presented to the class in some format in which students either read or listen.	**2.** Mr. Kensick assigns students to read an article about affirmative action and to write a response as an in-class journal activity.
3. Using newspapers and other media, students study current events in structured, in-class activities, either individually or in groups.	**3**. Mr. Matthews class works in groups to prepare essays or political cartoons based on newspaper and magazine articles about the results of the 2008 elections.

Most of the teachers in this study felt that there was a notable difference in how their honors students participated in a discussion on a current event versus how their honors students participated in a discussion of the same event. There is not sufficient data from this study to generalize that claim; there is more research to be done in this area. Conducting further, student-centered observations on this issue is an appropriate first step towards helping teachers learn hot to engage their standard students on a similar level to their honors students when it comes to current events.

Because this study primarily sought to gather data on methods for integrating current events, teachers were chosen based on their responses for how highly they valued current events and how frequently they used current events. Therefore this study did not take into account and investigate teachers who did not highly value current events or report a frequent use of them. Replication and recruitment of more participants to the study would be an approach to handling this limitation and to making all of the claims and results offered here the most conclusive and generalizable.

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The Use of Authentic Assessments in the Social Studies Classroom

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The purpose of this study is to gain insight into the use of authentic assessments in high school social studies. Conventional assessments such as multiple-choice tests seem to be the norm in most high school social studies classrooms as a result of the proliferation of state designed standards and end-of course tests. These conventional assessments fail to measure student's application of knowledge to real world issues and instead only measure a superficial understanding of the material (Wiggins, 1990), On the other hand, authentic assessments measure student's ability to apply higher-order thinking skills to critique and draw meaningful, relevant conclusions from what they have learned (King, Schroeder, & Chawszczewshi, 2001)..

Literature Review

Evidence is mounting for the need to use more authentic assessments in our schools. Based on research conducted by the Partnership for 21st Century Skills on the skills that today's employers' value, DiMartino and Castaneda (2007) recognize the need to employ more forms of authentic assessment in our schools. Today's economy is changing and research has reveled that the applied skills that are necessary for success in today's job market and for the future of our nation are not being properly addressed in our educational system (Hersh, 2007) . DiMartino and Castaneda (2007) argue that the authentic assessment model can provide the skills that employer's value. These skills require students to use prior knowledge and applied skills to solve more realistic, complex problems that better prepare students for future success than does the skill of simple fact recall measured in conventional testing.

Furthermore, authentic assessments have been shown to produce a positive effect on instruction as well as student engagement and performance (King, Schroeder & Chawszczewski 2001; DiMartino & Castaneda 2007; Petty 2007). Teachers claim an

instructional benefit when they have created assessment tools themselves (Jamentz, 1994). Active participation gives a teacher a sense of ownership by having created assessments and rubrics that are aligned to instructional goals. By contrast, teachers often use standardized test that they did not create in conventional testing. In terms of student performance, data from a five year study conducted by the Research Institute on Secondary Education Reform (RISER) in three high schools reveals that teachers who use more authentic assessments in the classroom in turn obtain more authentic work from students with and without disabilities (King et al., 2001). With these models, students are encouraged to learn a more in depth and relevant understanding of the material because they are constructing their own knowledge instead of merely reproducing facts. Furthermore, when students are asked to respond critically and constructively, we are creating opportunities for them to achieve more than they would through traditional assessments. (Bruce et al. 2001).

In addition, research by Petty (2007) has also revealed the positive effects of authentic instruction and assessment on student retention and engagement. Under conventional methods of assessments, teachers often feel that students hold no real value in learning and instead are only concerned with making good grades (Petty, 1997). When students are required to generate their own answers with reason and justification, they take more ownership in their success and failures. Petty (1997) notes that with the implementation of authentic instruction and evaluation in the classroom, students generally have a more positive attitude and exhibit more pride in their school work. This fosters responsibility, excitement, and interest in student learning and results in better overall student performance.

Methodology

Four volunteer participants for this study were solicited via email. An email constructed by the researcher outlining the requirements of the study was sent to all social studies teachers at local two high schools in the Winston-Salem/ Forsyth County School District in North Carolina. All social studies teachers at the two high schools were eligible to participate. Study requirements were to provide to the researcher 6 teacher-made assessment documents used in the classroom this year. The type of assessments documents were to be broken down as follows; 2 unit test, 2 quizzes, at least one project

or writing assignment, and at least one homework assignment or daily assessment exercise for a total of at least 6. The purpose of analyzing various assessment documents from each teacher was to understand the degree of authenticity in the assessment practices of each teacher. To measure the degree of authenticity of each assessment document, the research designated every task or question on each document as either authentic or conventional. Authentic task were those that required students to use at least one of the upper level thinking skills (applying, analyzing, evaluation, and creativity) on Bloom's Revised Taxonomy. The total number of authentic tasks was compiled and divided by the total number of tasks on the entire assessment document to provide an authenticity rating for each document. Once all documents were rated, each teacher was assigned an overall authenticity rating by averaging their individual document ratings.

After all assessment documents had been analyzed, participants were contacted by the researcher via email to set up individual interviews. The purpose of the interviews was to gain insight into the personal beliefs and biases concerning assessment practices used in their classrooms. Interviews lasted between 20 and 35 minutes and were conducted face-to-face during teacher planning periods or after school. All four teachers were asked the same 9 interview questions plus one additional question that was data specific to each teacher. Teachers were first asked questions designed to extrapolate personal beliefs, philosophies, and strategies concerning assessments in their classrooms. They were then asked to cite and explain how certain outside constraints, such as end-of-course tests, number of students, affected their assessment strategies. Teachers were also asked question designed to provide information on their individual understanding and use of authentic assessments. Finally, teachers were asked one data specific question based on the document analysis. Results of the interview were then compared to individual data from the document analysis in attempt to understand how logistical issues and the teacher's personal beliefs and knowledge impact their use of authentic assessments in the classroom.

Results

Results of the document analysis for all teachers were as follows:

Graph 1
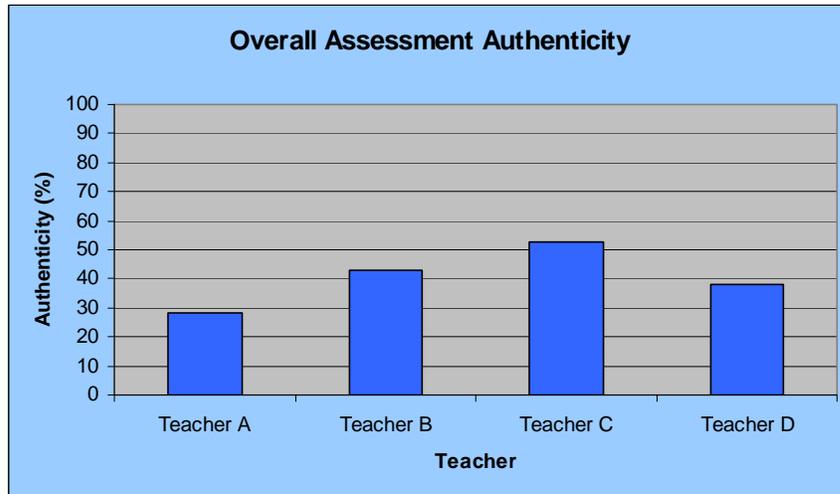
Interview Results

On the reasons why they did not use more authentic assessments in their classroom, teachers said:

- "I choose to use these types of questions [multiple-choice and matching] because they save me a significant amount of time in grading."
- "The number of students I teach are a huge impediment…"
- "If I didn't have family, church, and coaching responsibilities then maybe I would consider it."

On the effects of standard course of study and standardized tests, teachers said:

- "I have to teach what I don't find as important and interesting."
- "I am forced to use primarily multiple-choice tests because that it how they will be tested on the EOC."
- "I don't teach an EOC course… I believe that a well-designed multiple-choice question assess students appropriately. "

Analysis and Implications

All teachers in this study used some level of authenticity in their assessment practices. Although the benefits of authentic assessments were recognized by all teachers, each teacher's actual use of them in their classroom varied according to the influence of standardized tests as well as their own personal beliefs concerning authentic assessments.

The degree to which standardized tests impacted a teacher's use of authentic assessments in the classroom varied by teacher primarily due to the differences in courses

taught. For example, Teacher D does not feel constrained by standardized tests because he does not teach an EOC course. However, each teacher admitted to using more multiple-choice questions in their assessment documents because it would help familiarize their students with the format of standardized test. While each teacher admitted that these standardized tests limited their ability to use authentic assessments, only Teacher A surmised that they would in fact use more authentic assessments in the absence of standardized test. The rest of the teachers claimed that, in the absence of standardized tests, they would still use multiple choice tests because they are time efficient and easy to grade. For example, Teacher C believes that well designed multiple-choice tests assess students appropriately.

A much stronger influence on the use of authentic assessments in this study was the perception that authentic assessments are too burdensome to grade given their number of students. All teachers in this study taught at least four classes and a total of 100 students. All teachers perceive authentic assessments as assignments that require significant amounts of time to grade, thus impeding their personal lives and negatively impacting the use of authentic assessments in the classroom.

The results of this study provide testimony for the need of teacher training in how to effectively and efficiently implement authentic assessments into the classroom. As Bullens (2002), Nickell (1999) and Wiggins (1990) have pointed out, training teachers on how to design and use grading rubrics can greatly decrease the amount of grading time when scoring authentic assessments. Also, teacher training can help teachers learn how to design assessment tasks, such as in-class oral presentations, that still can develop higher order thinking skills in students without the teacher having to grade long written assignments (Guilkers, Bastiaens, & Kirschner, 2004). Nonetheless, it seems that the best way to reduce teacher bias concerning the amount of time necessary to design and grade authentic assessments is through effective teacher training programs.

Conclusion

We can conclude from this study that teachers' personal beliefs and attitudes concerning authentic assessments are a major factor is determining their use in the classroom. Although the results of this study can not be generalized due to the small

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sample size, this study does give use some insight into how personal beliefs, biases, and perceptions can influence teacher practice.

If we want to encourage the proliferation of authentic assessments in our classrooms, it is important that we educate teachers not only on the benefits of authentic assessments, but also on how to effectively and efficiently design and implement them in the classroom. As educators we must do a better job of preparing our students for a competitive college admission process and global economy that values critical thinking, creativity, and problem solving skills. We can cultivate these skills through the use of authentic assessments and avoid the traditional superficial reproduction of knowledge that results from conventional assessments.

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Assessment in High School Mathematics

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Dating back hundreds of years, educational reform in the public school system has been a hot topic within American society. Reese (2005) explained the battle between Progressivism vs. Traditionalism, with Traditionalism being considered the old education where "textbooks formed the main course of study" (p. 32). On the other hand, Progressivism was formed by people who believed the traditional education system was too formal, and instead thought the learning environment should be more child-centered and project-based.

More recently, classroom assessment practices have become part of the Traditional vs. Progressive discussion, and changes in assessment practices have been suggested as a way to improve K-12 mathematics education (NCTM, 1995). Teachers are being encouraged to move away from more traditional assessment methods, such as multiple choice tests, and move toward more progressive methods, like performance-based assessments (Swanson & Stevenson, 2002).

This leads to the research question for this study: How do high school math teachers assess their students, and why do they choose to assess the way they do?

Review of Literature

Due to the recent push for alternative forms of assessment, several research studies have been conducted to examine whether and how effectively teachers implement alternative assessments. A major goal of alternative assessments is to get beyond the standard computational side of mathematics, and into the students' understanding of mathematical concepts (Cooney, Badger & Wilson, 1993).

An important question to ask is how teachers assess their students? One research study looked into the types of instruments high school math teachers used for assessment

in their classroom, and to what extent those methods were consistent with the Curriculum and Evaluation Standards of the National Council of Teachers of Mathematics (NCTM) (Senk, Beckmann & Thompson, 1997). In this study, nineteen high school math teachers reported that their predominant assessment instruments were traditional and consisted of; tests and quizzes, followed by homework, oral reports, and portfolios.

A statewide study in Colorado surveyed students and teachers about assessment and instructional practices (Snow-Renner, 1998). In order to provide students with the Opportunity to Learn, Colorado reform goals stated the following three objectives: teachers should use assessments as part of a students' portfolio, basic skills and vocabulary should be tested, and assessments should be evaluated using a rubric. Teachers reported using more progressive than traditional assessment practices, such as math problems having more than one approach, or requiring a student to apply knowledge to real world problems. After analyzing the data, researchers observed classes and found that the teachers were not assessing their students in a progressive or reform-based manner, contrary to the survey responses. (Snow-Renner, 1998).

Garfield and Chance (2000) explored different statistics assessment methods that were in sync with the educational reform goals of mathematics education, and found the AP Statistics Exam to be "an influential model for assessment in secondary schools in the United States" (p.108). Their reasoning was due largely to the fact that the exam contained questions that required handwritten student responses, and that the open-ended questions were graded with a rubric. The open-ended questions accounted for half of the students' score, and required students to exemplify many skills within the same question. The purpose of using a scoring rubric is to provide consistent evaluation of students' critical thinking and responses to open-ended questions. On the AP Statistics Exam, the rubrics allowed students to receive credit for any correct method, but in order for students to attain the highest score, they must have presented "enough information so that the line of reasoning can be followed" (Garfield & Chance, 2000, p. 110).

Despite the recent push for alternative assessments, studies have found teachers still heavily use traditional methods in their classrooms (Saxe, Franke, Gearhart, Crockett, 1997). So in addition to being questioned about how they assess, teachers are pressured from many different angles to explain how and why they do what they do.

A common theme throughout research studies as to why traditional methods still prevail is the lack of teacher knowledge about progressive assessment practices (Snow-Renner, 1998). A suggestion to remedy this problem is to provide training on what alternative assessments are and how to use them (Ohlsen, 2007).

Methodology

The participants in this study were high school math teachers in a diverse school district in central North Carolina. All high school math teachers in the district were sent an email invitation to take an online, anonymous survey. Results from the survey were collected by Google Docs. On the anonymous survey, teachers were invited to participate in a follow-up interview. The data from the interviews was digitally recorded and transcribed. See the Appendix to view the survey and interview questions.

The responses to the survey questions were categorized as either progressive or traditional assessment methods. The first twelve questions were rated on a Likert Scale between 1 and 3. The responses were summed, and the higher number meant the teacher used that assessment method "Often", and the lower number meant the teacher used that assessment method "Never". The last ten questions asked teachers to state the percentage of time certain progressive assessment methods were used.

Then follow-up interviews of seven teachers, some who used more traditional assessment methods, and some who used more progressive assessment methods were conducted. After the interviews were complete, the survey and interview data were reanalyzed to identify the most progressive and traditional teachers.

Results and Conclusions

Twenty three out of approximately one hundred high school math teachers volunteered to participate in the study, by filling out the online survey. Of the twenty three teachers who responded, seven agreed to a follow-up interview.

Types of Assessment. Teachers reported the highest frequencies of use for major exams, teacher originated assessments, quizzes, and homework checks. Teachers reported the lowest frequencies of use for oral presentations and essay questions. Table 1 represents the percentages of teacher responses to the first twelve questions on the

survey, which are all specific types of assessment methods teachers reported using in their classroom.

Table 1. Types of Assessment

Types of Assessment	1 Never	2 Sometimes	3 Often	Sum of Sometimes & Often
Major Exams	0.0%	54.5%	45.5%	100.0%
Teacher Originated Assessments	0.0%	17.4%	82.6%	100.0%
Quizzes	0.0%	30.4%	69.6%	100.0%
Homework Checks	0.0%	39.1%	60.9%	100.0%
Objective Assessments	4.3%	47.8%	47.8%	95.7%
Formative Assessments	8.7%	30.4%	60.9%	91.3%
Performance Assessments	13.0%	30.4%	56.5%	87.0%
Individual Projects	21.7%	60.9%	17.4%	78.3%
Team Projects	34.8%	56.5%	8.7%	65.2%
Non-teacher Originated Assessments	39.1%	39.1%	21.7%	60.9%
Oral Presentations	56.5%	43.5%	0.0%	43.5%
Essay Questions	65.2%	34.8%	0.0%	34.8%

Although the data suggested traditional major exams, quizzes, and homework checks were the predominant choices for student assessment, one hundred percent of teachers reported using teacher originated assessments "sometimes" or "often." Teacher originated assessments are assessments created by the teacher, and are the opposite of non-teacher created assessments, which are typically publisher created assessments found in instructional manuals.

These results indicate that there is a mixture of assessment methods in the mathematics classroom. More than fifty percent of teachers reported using the following progressive methods "sometimes" or "often": team projects, individual projects, and performance assessments.

In contrast, the data also showed more progressive assessment methods, such as oral presentations and essay questions were used very little, with sixty-five percent and fifty-six percent of teachers, respectively, "never" using these assessment methods. Both these methods would require students to show their understanding of mathematical concepts in a nontraditional manner.

Progressive Content of Assessment. The last ten questions of the survey asked teachers to state the percentage of time certain progressive assessment methods were used in their classroom. The data collected in the "Types of Assessment" section suggested teachers were using a mixture of assessment methods, while the data collected here

suggests otherwise. The following table shows the percentage of teachers who use certain progressive assessment methods more than fifty percent of the time.

Table 2. Progressive Content of Assessment

Type of mathematics assignment or assessment that…	Over 50% of time
require students to apply concepts or principles they have learned to new situations or problems	43.5%
become part of a portfolio of students' work	34.8%
require students to apply what they have learned to real life situations or problems	26.1%
demonstrate basic skills/vocabulary	26.1%
have more than one answer approach	17.4%
are evaluated with a rubric	13.0%
require students to evaluate and improve their own work	13.0%
require students to provide a narrative explaining their reasoning	4.3%
require students to explain their reasoning orally	4.3%
require students to conduct investigations over several days	4.3%

This data indicates that although teachers may be using some progressive assessment methods, they are not using them the majority of the time. Only four percent of teachers reported more than fifty percent of the time using assessments that required written or oral explanations of reasoning, and assessments that required students to conduct investigations over several days.

Interview Data. All interview questions were designed to attempt to understand why teachers choose to assess the way they do. Both Teacher A and Teacher B have similar education backgrounds, and teach similar courses, which made the interview data more comparable. When asked for an interpretation of alternative assessment, Teacher A was accurate, and stated it is, "looking for explanation, understanding for why they got what they got, or why they did what they did. And not just having either multiple choice or open-response questions where you just work out a math problem and get an answer."

For the past six or seven years, Teacher A has been teaching Integrated Math, and assessing in a reform-based manner. Teacher A explained that even though students are taught differently in Integrated, they still do well on traditional End of Course tests because they have learned how to think. Teacher A has attended several professional development workshops over the years, and over the past two years, Teacher A has been a facilitator, and not an attendee.

In contrast to Teacher A, Teacher B freely admitted to struggling with creating alternative assessments, and admitted to seeing math "as just math, and you have to work the problems. It's just so easy to say, 'here, do these problems', and I can grade it, even though that's boring and old school." Also in contrast to Teacher A, Teacher B has attended only a few professional development workshops in math education over the past two years.

Implications

Based on the survey data, it appears that teachers are continuing to use traditional assessment methods as the main source of assessment in their classrooms. After interviewing the seven teachers and further analyzing two of those teachers, it seems that teachers' perceptions of what alternative assessments are and their training on alternative assessments may factor into why more alternative assessments are not used in the classroom. There is a need for increased research, teacher education and professional development about alternative assessments.

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What's in a Smile? Teacher Positivity and Student Engagement

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Teachers (and government officials) are constantly searching for ways to increase student achievement, motivation, and enthusiasm. This study sought to establish whether there is a correlation between the amount of positivity a teacher displays and the engagement of the students in his (or her) classroom. Positivity was defined in terms of four observable acts: smiles, laughter, encouragement, and praise. The study focused on four "Master Teachers" at a suburban North Carolina High School and up to four of each of their classes. This study also sought to determine which of these four manifestations of positivity occur most in the classrooms observed and to report how frequently the Master teachers displayed these kinds of positivity. Results of the study showed no conclusive correlation between the average instances of positivity and the engagement of the students in their classrooms. Data did indicate a possible correlation between the amount of praise a teacher gave and the engagement of that individual's students.

Review of Literature

For the purposes of this study, the researcher chose to examine dimensions of both verbal and nonverbal communication in order to study teachers' transmissions of positivity through both forms. Rice and Doan's (1981) study found that the "expression" on a teacher's face and the "intonation" of his/her "verbal statement" affected student response and accuracy more than the "content" of their statement (Abstract).

Teacher positivity could play a role in creating more meaningful and effective relationships between teachers and students. Regarding smiling, Bancroft (1995) states that teacher who smile "frequently" convey "immediacy" and that "students at all levels are sensitive to smiles as a sign of positive interest and concern" (p.8). Bancroft (1995) also reminds us that, "An early study by Barr (1929)…found that "good" teachers

engaged more often in laughter…" (17). Studies by Galloway (1968), Miller (2005), and Roberts and Becker (1973) produced similar findings.

The verbal aspects of this study (related in terms of encouragement and praise) also have the potential to affect the environment and relationships in the classroom very strongly. Researchers were consistent in their conclusions that teachers who encourage their students have a positive effect on the relationships they create with their students. Bartholomew (1993) suggests that the true "purpose" of encouraging students is "give [them] hope and inner strength"—yet another way for teachers to build stronger, more effective relationships with their students (Encouragement, para. 1).

For Cheney (1989), "encouraging interactions with students" constitute one of the "keys" to preventing student "discipline problems" (p. 11). Bancroft (1995) likewise argues that teachers who exhibit behavior that is "warm," "spontaneous," and "friendly" elicit more positive attitudes (toward "the course, the subject matter, and the educational institution") in their students (p. 29). The specific teacher acts included in this study (smiling, laughter, encouragement, and praise) could certainly present a "positive attitude" to students, and therefore retain the possibility of changing student behavior for the better. The proven effects of teacher enthusiasm on student achievement suggest that Patrick, Hisely, and Kempler's (2000) assumption that "enthusiastic" teachers might influence their students' "intrinsic motivation" is not far off the mark (para. 6). Murphy and Walls (1994) refer to Brigham's (1991) study which reported that "teacher enthusiasm" was a "significant predictor of achievement," showing that after being subjected to "enthusiastic teaching," students scored "substantially higher" than when they received "less enthusiastic teaching" (p. 6).

As a result of an interview study they conducted, Pitton, Warring, Frank, and Hunter (1993) concluded that most teachers simply do not have an understanding of the variety in nonverbal behaviors across cultures (i.e., that certain nonverbal behaviors that are considered "acceptable" in one culture may be taboo in another) (p. 3). Overall, therefore, it is important for teachers to recognize that what is considered "positivity" in one culture could be interpreted completely differently by another.

The second part of this study involves student engagement. If positivity could be linked to engagement, it could have huge implications for teacher behaviors, helping

educators find new ways to increase engagement and achievement in their own classrooms.

Methodology

The over-arching question the researcher asked was, "Is there a relationship between teacher positivity and student engagement?" The researcher defined positivity in terms of four specific acts: smiling, laughter, encouragement, and praise.

The researcher conducted a qualitative study based on observations of at least ten class periods of each of the four teachers, for a total of forty-three observed classes. This portion of the research focused on teachers' observable actions, specifically smiling, laughter, encouragement, and praise. The researcher defined *encouragement* as any verbal comment meant to support a student or urge them forward. *Praise* was defined as any verbal comments meant to reward or congratulate a student for good work, behavior, etc. In order to gauge overall class "engagement" by teacher, the researcher purposefully selected five different students each class period (a particular row of students in each period, for instance) and noted at five minute intervals whether each student was demonstrating behavior that was "engaged" or "disengaged." Some examples of student behavior the researcher termed "engaged" included making eye contact with the teacher, note-taking, and making on-topic responses to the instructor.

Results

Figure 1. *Instances of Teacher Positivity*
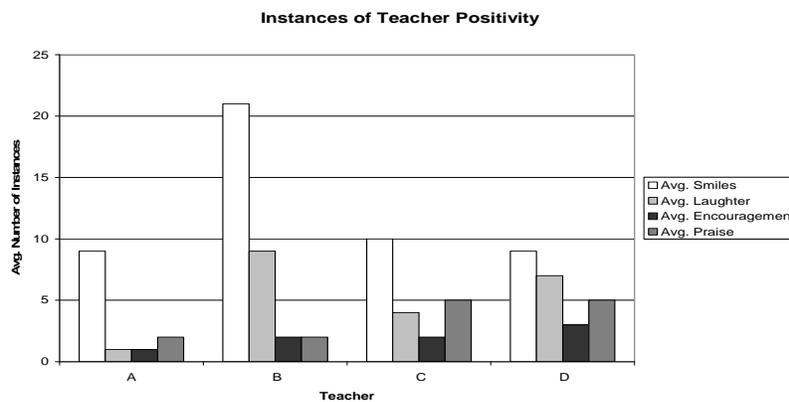
Figure 1 shows the average number of occurrences of each type of positivity per teacher. Smiling was the most frequent form of positivity displayed overall. On average, teachers displayed more nonverbal positivity than verbal positivity. Teacher B was consistently the most nonverbally positive, while Teacher D was the most consistently positive verbally.

Figure 2. *Positivity and Engagement*

Positivity and Engagement
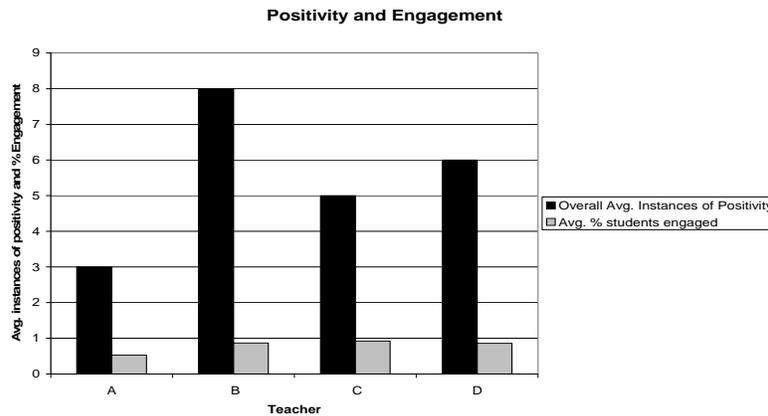
Figure 2 shows the overall average occurrences of positivity (including both nonverbal and verbal) and the average percentage of engaged students per teacher. Although the teacher with the lowest frequency of positivity (Teacher A) also maintained the lowest percentage of engaged students, the teacher who displayed the most positivity (as measured by this study) did not have the highest percentage of engaged students. Therefore, these results show no conclusive correlation between the average amount of teacher positivity and student engagement.

Figure 3. *Praise and Engagement*

Praise and Engagement
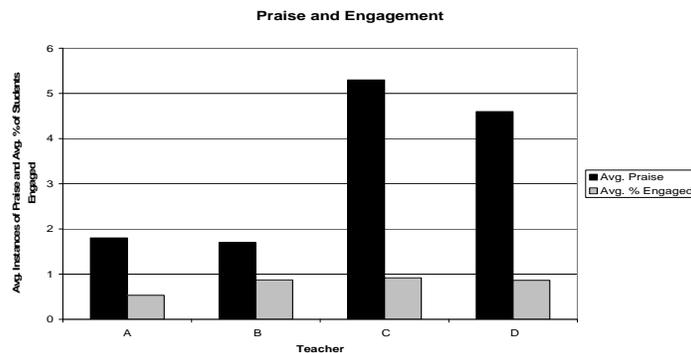
Figure 3 isolates the average number of instances of praise per teacher next to the average percentage of students engaged per teacher. Teacher C displayed both the highest frequency of praise and the highest level of engagement.

Analysis and Implications

Although this study shows inconclusive results, the researcher believes that positivity is still an important factor in the classroom. Both Teacher B (the most nonverbally positive) and Teacher D (the most verbally positive) had high levels of student engagement as opposed to Teacher A, who displayed the least positivity and had the least engaged classes overall.

Moreover, other factors such as the time of the class observed, the level of the students, and the material being presented could have had marked effects on student engagement, making it difficult to isolate positivity as a single factor. Although the results of this particular study were inconclusive in terms of a relationship between positivity and student engagement, a study conducted on a greater number of teachers for a greater length of time would more than likely show greater trends or correlations. The results do indicate that teachers display far more positivity nonverbally than verbally. They also suggest that there is a relationship between the amount of praise a teacher gives and student engagement. The results of multiple other studies suggest that related teacher acts such as enthusiasm and encouragement have a positive effect on students, so teachers could always benefit from reflection on their own positivity practices.

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Teacher Perceptions of Socioscientific Issues in the High School Biology Classroom

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Socioscientific issues (SSI) is a pedagogical framework that involves coupling scientific concepts with social dilemmas (Sadler, Chambers, & Zeidler, 2002). SSIs were designed to engage students and give meaning to science in real-world applications (Sadler, Amirshokoohi, Kazempour, & Allspaw, 2006). Current research supports teaching through the SSI framework. Additionally, Osborne, Erduran, and Simon (2001) posit that teaching SSIs increases a student's ability to critically evaluate scientific literature. Further, the ability for students to academically discuss and resolve ethical issues is considered a component of scientific literacy (Miller, 1988). For many educational policy-makers, scientific literacy is the goal of science education (Kemp, 2000). Although what comprises scientific literacy is a subject of debate (Kemp, 2000), this "personal science" includes issues that help define the discourse of society, including SSIs (Sadler et. al., 2006).

Unfortunately, the teaching of ethical issues in science is often side-stepped in favor of a more factual brand of science (Sadler et. al., 2006). This occurs because teachers often perceive science ethics in the classroom, particularly related to SSIs, as difficult to teach, not a part of the science curriculum, or secondary to the factual content of the science curriculum (Sadler et. al, 2006). Little consensus has been reached among teachers regarding the role of ethics in the science classroom.

A misalignment occurs between teaching theory and teaching practice in regards to SSIs. This study attempts to answer questions regarding how biology teachers view the role of ethics in science education:

1.) How do biology teachers view the role of ethics in science as a whole?

2.) How do biology teachers manage the teaching of topics with ethical implications?

3.) How do biology teachers view the role of ethics in the high school biology curriculum?

Review of Literature

Scientific Literacy

The ability to understand and apply science has been termed *scientific literacy* Mitman, 1985). Scientific literacy is popular among both teachers and policy makers. Three components almost universally included within the definition of scientific literacy are conceptual knowledge of the sciences, the relationship between science and society, and science and technological development (Kemp, 2000). Because science was already being taught as a base of conceptual knowledge, science education researchers advocated a shift toward teaching students how to understand the relationship between science and society and between science and technology. Out of the societal impact component of scientific literacy have grown two frameworks: Science-Technology-Society and later, Socioscientific Issues.

Socioscientific Issues

Socioscientific issues (SSIs) couple scientific concepts with social dilemmas (Sadler, 2002). The conceptual framework of SSI, as established by Zeidler and Keefer (2003), notes four areas of pedagogical importance for teaching: nature of science issues, classroom discourse issues, cultural issues, and case-based issues (Zeidler and Keefer, 2003). Proponents of SSI suggest that when SSIs are taught properly, students will benefit through increased scientific literacy, and education research backs that notion.

Teachers' Personal Perceptions of Ethics in the Science Classroom

A 1998 study of Portuguese science teachers found that more than half of science teachers felt that they knew very little about specific socioscientific issues (Martins, 1998). In Turkey, university science education students preparing to teach secondary school were posed with questions regarding their perceptions of ethically relevant issues in the science classroom. The study revealed a basic level of understanding of the relationship among science, technology, and society, but little understanding of how ethics and science are related.

Teaching Inconsistencies in Teaching Socially Relevant Issues

In addition to teacher knowledge regarding scientific issues, teachers need resources and training if they want to incorporate ethical discussion and issues into their classes. Despite a willingness of teachers to introduce SSIs into their classroom, teachers report that they receive little training regarding value-laden issues, and they are unfamiliar with SSI teaching resources (Glenn & Gennaro, 1981). Inconsistencies in the implementation of socially relevant issues into the science classroom are found within past SSI research.

Recently, Sadler et al. (2006) explored how science teachers conceptualize the role of ethics in science and science education, as well as how they handle topics with ethical implications and how they express their own values to their students. Responses of teachers were extremely varied. Some teachers consistently taught SSIs while others supported the use of SSIs in theory but had little time to incorporate SSIs into the classroom. Still other teachers were noncommittal regarding giving their students ethics instruction.

Methods

To best understand teacher perceptions of how to teach socioscientific issues, semi-structured interviews were used to give an appropriate depth of questions and answers. The interview protocol challenged participants to consider the idealized role of ethics in science and science classrooms. Purposive sampling was used to select six high school biology teachers within Winston-Salem/Forsyth County Schools based upon teacher experience, teaching certification and having taught high school biology. Three teachers are National Board certified. After collection, the data was analyzed to indentify themes within the teacher responses. The data was then codified and reported using Inspiration software.

Results

Biology Teachers' Perspectives of Ethically Relevant Issues Are Extremely Varied.

When taken as a whole, the participants' answers revealed three major and differing perspectives regarding socioscientific issues. These profiles seem to represent

different points on a spectrum. Teachers that fit profile A perceive science and ethics to be essentially unrelated, the amount of ethically-laden content in the curriculum to be extremely limited, with evolution as the main source of controversy, and their views regarding ethically laden issues to have little place in the classroom. In contrast, teachers that fit profile B consider science and ethics to be impossible to separate, note a variety of issues from the high school biology curriculum with ethically-laden issues attached, and are willing to share their personal views regarding these issues. They stress the importance of teaching students the relationship between science and ethics in their teaching. Teachers within profile C consider science and ethics to be related, but do not emphasize the role of ethics in their classroom. While they may be able to list some ethically-laden issues within the curriculum, they do not emphasize ethics to a great extent in their curriculum.

Several Factors Contribute to the Limitation of SSIs in the Biology Classroom.

Within all three teacher profiles, a number of factors were noted that limit the time available to discussing socially relevant issues. One factor noted by all participants were issues related to completing all the content as set forth by the state curriculum. In order to cover all the content, and in order to remain on track with the pacing guide provided by the county, teachers must move quickly through the topics that they teach.

Another factor that was noted as limiting the discussion of SSIs was influence from the school and county administration to avoid controversial issues and sharing an opinion regarding personal beliefs. One teacher noted, "The county administration has made their position clear; we are not supposed to share our personal opinions with students. But, I hope students see, from the choices that I make, how my beliefs about these issues affect my actions." Lastly, a lack of training regarding how to teach SSI in combination with a lack of resources was noted as a factor that limited the amount of time spent on ethically relevant issues.

Discussion

Those teachers who did not emphasize the role of ethics in their classes also noted a lack of maturity and a need to emphasize conceptual knowledge. This could indicate a lack of understanding on the part of their students of conceptual issues. However, through

teaching with SSIs, research reveals an increased engagement of students of all ability levels (Walker, et. al., 2003). This is consistent with the perceptions of teachers from profile B. There is a large misalignment between teaching theory and teacher practice of certain entities of the body of high school teachers.

Interestingly, teachers in profiles A and C listed evolution as the major ethically-laden issue within the high school biology curriculum. Although evolution is sometimes controversial, it is not actually laden with ethical decisions, and thus is not really an SSI. However, a number of issues are explicitly listed in the Standard Course of Study (North Carolina Department of Public Instruction, 2004). This indicates that some teachers are not familiar with the emphasis of social issues that is found within science education standards, including biotechnologies, genetic disorders and genetic screening, the impact of the human population on the natural world, and food biotechnology.

Although some teachers teach SSI and noted the format of their teaching, no teachers noted a particular resource or structured framework from which they teach these issues. Additionally, some teachers' descriptions of the relationship between science and society and its role in scientific literacy were not in accord with the standard course of study. These two factors, when considered together, suggest an overall lack of training regarding this ethical aspect of science.

Suggestions for Further Research

Some teachers revealed a lack of understanding of the nature of science, a limited knowledge about the interplay between science and society, and a misconception that the role of ethics in the high school biology curriculum as limited. Considering these three major findings, we suggest that further research should be conducted with teachers who cite unfamiliarity with SSIs and science and society in which they participate in a SSI teacher training workshop. The workshop should address misconceptions that teachers have about what components make up scientific literacy and that social issues play a role in its definition. Additionally, those participating in the workshop should address the misunderstanding that teaching concepts through the SSI framework means much more than adding extra days to a class to discuss and issue, but involves exploration of scientific knowledge from a particular viewpoint. The workshop should also include a

discussion of what SSIs are present within the high school biology curriculum. During the workshop, researchers should note teachers' perceptions of SSI before and after their training. Additionally, the study could follow up with participants and identify how the workshop may have influenced their teaching of SSIs. Doing so could greatly increase the number of teachers who utilize SSI as an instructional tool in their classrooms.

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Determining the Most Effective Style of Note Taking:
A Study on Note Taking in High School Social Studies Classrooms

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Different styles of note taking have been extensively studied because it has been recognized that notes are important to students for a variety of reasons. One reason it is important to introduce high school students to note taking is because more high school students should be and are college bound. Along with this, another importance of notes is that they offer students an external storage device. Several studies have proven that having students take notes are beneficial because they give the students an additional resource to study from for the test (Einstein, Morris, & Smith, 1985; Palkovitz, & Lore, 1980; Pollio 1990).

Two other reasons that contribute to the importance of note taking are that note taking allows for repetition and review. Kiewra, DuBois, Christian, McShane, Meyehoffer, and Roskelley (1991) found that the students who reviewed notes remembered the most information. Note taking has also been proven effective in helping students organize the information they are required to learn. Einstein et al. (1985) found that students who took notes were better able to organize the information from the lecture. Pollio (1990) found that giving students a skeleton outline of notes, to fill in as the lecture progresses, may help less-able note takers better organize their information.

Similar to helping students organize information, note taking has also been shown to help students as they encode information. In Davis and Hult's (1997) study, they found allowing students time to summarize their notes during the lecture increased the amount of information students were able to encode. Forcing the students to summarize their notes forced them to reprocess the information, and review, which resulted in the students encoding information on a deeper level.

Research has demonstrated that another reason students should take notes is because notes force students to pay better attention in class. The students who participated in Pollio's (1990) study listed the main reasons they took notes in class. The first reason was because taking notes helped them pay better attention in class, therefore they learned more from the lecture. Neef, McCord, and Ferreri (2006) found that students had similar opinions, to the ones in Pollio's study, in their own study. Overwhelmingly the students preferred the guided notes over personal note taking because they felt the guided notes allowed them to stay more focused and enabled them to follow along more closely with the lecture. In addition to helping students pay attention, note taking has been shown to raise the achievement levels of students (Titsworth & Kiewra, 2004). Whatever the reason, there are a great number of benefits for students who take notes during a class lecture.

According to Palkovitz and Lore (1980) the problem comes when students take incomplete notes. The difference between guided notes and complete notes has also been studied. Neef et al. (2006) allowed students to either download a set of completed notes (which were exact copies of the teacher's PowerPoint presentations) or guided notes (copies of the PowerPoint presentations with blanks for the students to fill in during class). In another study on the effectiveness of guided notes, Austin, Lee and Carr (2004) formed three groups of students to measure which style of note taking facilitated the recording of the highest amount of main ideas from the lecture.

Student Engagement

There are a variety of reasons why students attend school. Teachers are often conscious of these reasons and strive to engage students in any way possible. One practical measurement Yazzie-Mintz (2006) gives for measuring student engagement is to observe how on-task a student is. In Yazzie-Mintz's survey, the students ranked listening to a teacher's lecture as the most boring of the given activities. Engaging students is critical as a high school social studies teacher. This study will observe different styles of note taking techniques in the effort to find the style that best engages students.

Most of the evidence from the literature points to guided notes, or a form of skeleton notes, as being the most effective technique of note taking for most all levels of students. Although note taking can take many forms, for the purpose of this study, note taking will be defined as the manner in which teachers expect students to write down any information they are presenting in class, as well as the manner students are actually writing down this information. As I research the different styles of note taking being used in these social studies classrooms, the central focus of this study is to determine the most effective style of note taking among high school social studies students.

Method

I emailed all of the social studies teachers in the Winston-Salem Forsyth County public school system. I then randomly selected the first eight teachers who responded, to interview and observe. I interviewed teachers on the note taking techniques they expected from their students. Then I observed their classrooms to see the actual note taking techniques put into practice. I also looked at the amount of student engagement. On the right-hand side of my paper I counted the number of students either engaged or disengaged and took notes on the various levels of student engagement that were demonstrated.

Results

From the teacher interviews it was clear that not all of the teachers required their students to take notes in the same way. Six of the teachers provided their students with a handout. Of the other two teachers, one does not require her students to take notes, yet she highly encourages it, and the other does not lecture his students, but rather has the students complete worksheets from their reading; thus they are not taking notes so much as they are noting information. The interview was also designed to question the teachers about their reasoning for having students take notes; there are five main themes that can be extracted as to why teachers have their students that notes.

The first main reason teachers had their students take notes was that by taking notes more students are better able to pay attention to and keep up with the lecture. One teacher that mentioned this said when she first started teaching she tried just writing a

few key terms on the board, however she quickly noticed she was losing a lot of students using that method. Therefore she switched to giving students a graphic organizer to take notes with. She has been happy with the increase in the number of students who are able to pay attention and keep up with her lecture using this method.

Next, five out of the eight teachers mentioned explicitly that one of the reasons they have their students take notes is because notes facilitate the learning of the information. In one class (where the teacher wanted his students to take notes because it would help them learn the information better), the teacher would periodically pause during his lectures to ask review type questions and higher order thinking questions of his students. The students who were able to answer these questions were the students who were taking notes.

A third reason teachers have their students take notes is that these notes can later be used as a study tool, or an external storage device. Teachers see notes as an alternative to the textbook or other sources for students to use as they study the information they learn in class. One teacher said that her students would use their notes to "study for the test and even use the same notes to review for the Advanced Placement test." In one class this researcher observed, the students were going to be taking a quiz and were allowed the first five minutes of class time to study. In a class of twenty one students, only four students did not have notes to study from during these five minutes. Not every student was studying, but the majority of students were either intently reading their notes or asking the teacher or each other content related questions. In some cases the teachers see notes as a study tool by allowing them to use their notes on an open note quiz; however, even these teachers mentioned in their interviews that notes provide students with a good source of information to study from for future tests.

A fourth reason teachers mentioned for giving students notes is that providing students with guided notes, or a graphic organizer allows them to cater to the needs of those students with learning disabilities. In the interview, one teacher said, "Graphic organizers appeal to visual learners; it is easier for them to see the connections." In some cases, this also means that the teacher can fill in the notes for those students who are unable to write, or who write extremely slowly. These outlines also helps move the class seamlessly from one point to another. For example, in observing classrooms, it is easy to

see that some students take notes faster than others. In one class, the teacher presented the students with the term "the Missouri Compromise." Some students were able to write down exactly what the teacher wanted the first time the teacher said it, while other students needed repeated clarification.

The final reason teachers cited for having their students take notes is that note taking is a skill their students can take with them and use in the future. One teacher mentioned in her interview, "Note taking is a skill they can take to every class." This teacher realizes the importance of teaching students not only the content information they are ultimately responsible for, but also the importance of teaching them a skill that will be helpful for them in the future.

Discussion

A teacher's main job is to provide students with the information they will essentially be responsible for knowing. Teachers may decide to present this information in various ways; one such way is through the use of lecture and note taking. As if they had read Kiwera et al.'s (1991) study on note taking, almost every teacher in this study said they had students take notes so they would have an external storage device to review from.

One method teachers in this study used to facilitate note taking among their students, was through the use of graphic organizers, charts, or handouts. These teachers speak to the point that Einstein et al. (1985) raised at the end of their study, which was that notes helped students organize information better and that the students who were able to organize information in the most effective ways, may be the students who are also the highest performing students.

The manner in which the teacher conveys their information to the students may also have an effect on the engagement level of the various students, and may contribute to whether or not the students are taking notes. Some teachers may require students to take notes (assessing whether they have done so by doing a notebook check or an open notes quiz), while other teachers may give their students a little more freedom when it comes to taking notes. The level of discipline a teacher enacts, or the amount of side conversations a teacher allows while he or she is talking, all may also factor into the engagement level

of the students. Because this study did not cover these outlying factors, more research should be done to determine the most effective style of note taking among high schools social studies classes.

Providing students with a handout that has a clear space set aside for notes seems to be the most effective style of note taking among high school social studies students. This handout helps the students pay attention to the lecture, as well as provides them with a great study tool to use for a future test. This style of note taking may require a little extra effort on the part of the teacher, but the students seem to respond to this method best. Providing students with a handout to aid them in their note taking is one of the most effective ways a high school student can take notes in a social studies class.

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An Investigation of How High School Students Solve Linear Equations

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Algebra is a key subject in the study of mathematics because a solid basis in algebra is necessary for success in higher level mathematics. More so than perhaps any other subject, mathematics is a subject which continually builds upon itself, and thus a strong grasp of the basics is essential to expanding one's knowledge in the field. With NCTM's (2000) Learning Principle in mind, it is clear that for future success in mathematics, students must not only learn Algebra, but must also have a meaningful understanding of what they are learning.

The unfortunate truth is that far too many students are not learning algebra with understanding. In 2008, the National Mathematics Advisory Panel reported that students consistently made errors when solving linear equations demonstrating a lack of understanding of basic principles and failed to understand the procedures for solving equations and why these procedures work. The panel suggested that by examining the common errors that students make, educators are more likely to be able to "remediate overgeneralizations or misconceptions" (p. 33).

As a result, there have been a number of studies conducted in an attempt to determine what exactly these errors are, especially in the case of solving linear equations. Errors have been shown to be linked to both misunderstandings of fundamental concepts, as well as to computational errors in fundamental processes. In a study of middle and high school students, Wagner (1981) found that almost one half of students who had been exposed to formal algebra believed that changing the variable in an equation (i.e. substituting W for N) could have an effect on the value of the variable. Bernander and Clement (1985) reported similar misunderstandings of variables and equation equivalence when they found that students failed to understand that a letter variable stands for a number.

Erroneous equation solving is not just the result of misunderstandings of fundamental concepts, however, as a number of studies have documented procedural and computational errors as well. In a study of algebra students, Davis and Cooney (1977) administered a written exam and concluded that the most common errors were arithmetic, including the misuse of the rules for adding or subtracting positive and negative numbers. Carry, Lewis and Bernard (1981) performed one of the most extensive collections and documentations of student errors in equation solving, and their research yielded a categorization of errors, which included errors with transposition, combination, and cross-multiplication, as well as errors with fractions, grouping, inversion and distribution.

Much of the older research focused on simply cataloging errors and often failed to address student's solving strategies and reasoning for making these errors. Huntley, Marcus, Kahan, and Miller (2007), however, studied both aspects when they asked student pairs to solve linear equations. They found that an overwhelming majority of the student pairs could successfully solve an equation with a unique solution, but students had much more difficulty and were less successful solving equations with no solution or a solution of all real numbers. The study also found that while most students could correctly link the unique solution to a graphical representation, they had more trouble graphically representing the identity and contradiction equations.

It is clear that while there is abundant research on the errors that students make in solving equations, there is a lack of recent literature on the strategies that students use and the reasoning they employ in solving. Thus, with the NCTM Principles and Standards in mind, this study will attempt to discover what types of algebraic errors students are making when they should have a firm grasp of the subject. Specifically, this study will examine the strategies that students use to solve linear equations with variables on both sides and will try to determine their level of understanding through their communication of their reasoning strategies as well as their ability to graphically represent the problem. By examining the errors students make and their reasoning for these errors, we can hopefully come to a better understanding of how to remedy these errors in the future.

Methodology

The participants for this study were 14 Algebra II students in a diverse school district in North Carolina. Participants were given three linear equations to solve for x – one which had a unique solution, one which was an identity, and one which was a contradiction (that is, it had no solution). Participants were asked to talk through the problems aloud as they solved them and were told that they could solve the equations any way they felt comfortable or knew how and were given a graphing calculator to use in any way that wished to do so. After solving the equations, the researcher questioned the participants about their solving strategy and asked them how they would represent their solutions graphically. The researcher took notes of the students' solving process on coding sheets but did not correct participants' mistakes as they solved, nor provide them with feedback on their performance.

Data analysis included transcribing and analyzing audio recordings as well as analyzing students' written work and interviewer's coding sheets. Written work and student comments were analyzed for errors and strategies using constant comparison to define recurrent themes.

Results

After analyzing students' comments and written work, their solutions were arranged in four categories: correct, correct with prompting, incomplete, and incorrect. Figure 1 summarizes the results for each of the three problems. Students' work and solutions indicate an overall difficulty with solving linear equations. Students especially experienced difficulty solving problems 2 and 3, which were an identity and contradiction, respectively.

Figure 1: Correctness of student solutions			
	Number of Students		
	Problem #1	Problem #2	Problem #3
Correct	4	0	2
Correct with prompting	0	1	4
Incomplete	2	2	2
Incorrect	8	11	6

The Solving Process

The solving method of choice for 13 of the 14 students was to isolate x using algebraic manipulations. When asked why they chose that method, more

than 50% of the students responded that it was the only way they knew to solve for x. Student F did not prefer to use algebraic manipulation and attempted to solve the problems using a guess-and-check method instead. While 86% of the students used the calculator to aid them arithmetically, no student used the graphing functions of the calculator to solve the problems, and when asked by the researcher how they might solve the equation graphically, only Students B and H were aware that they could graph each side of the equation in the calculator.

During their interviews, half of the students explicitly stated that they felt they had done something wrong, however, only Student G acted on his inclination and checked his answer by plugging it in to the original equation. The fact that students did not go back to check their work could be a contributor to the high number of incorrect answers reported.

Common Computational Errors

Nine of the 14 students (64%) committed errors relating to the distributive property. In solving, all students correctly recognized the need to distribute in all three problems, and most were able to reference the property by name. However, a number of errors were made in the execution of the property. Five students failed to distribute the multiplier to the second term in the parentheses, and four students failed to distribute the negative sign to both terms inside the parentheses in problem 1.

The most frequent errors committed by students were simplification errors, most of which were related to combining like terms. While the same number of students (64%) committed simplification and distributive error properties, simplification errors were often committed more than once by the same student. For example, Student B's work demonstrates at least six errors in simplification. Common simplification errors included incorrectly combining like terms by performing the opposite operation on the same side of the equation, performing the wrong operation to combine like terms, and concluding that $12x - 12x = x$ instead of 0.

In addition to errors with the distributive property and simplification errors, simple arithmetic errors were also prevalent and found in the work of six of the fourteen students (57%). These errors included mistakes in the four basic operations. All of the

addition and subtraction errors were related to instances involving negative numbers. These errors were committed by 36% of the students and suggest either a general lack of knowledge of basic number operations or a lack of the skills to perform these operations, both of which can be detrimental to a student's success in mathematics.

Difficulty Solving Identity and Contradiction Problems

While students experienced an overall difficulty in solving all three types of equations, they seemed to encounter significant difficulty with problems 2 and 3, which were an identity and contradiction, respectively. In fact, no student successfully solved the identity equation, and only two were able to solve the contradiction with no prompting from the researcher. Many students expressed confusion at having $12x$ on both sides of the equation. Furthermore, while some students arrived at incorrect answers for problems 2 and 3 as a result of errors in algebraic manipulations, others were impaired by not realizing that the solution could be all real numbers or no solution.

Graphical Representations

Students' general difficulty with solving the three equations was mirrored in their difficulty of understanding the graphical representations of the equations. As stated earlier, no students used graphing to solve the equations, and only two were aware that the strategy was even an option. All students required an explanation that each side of the graph would be a line. After this explanation, five students concluded that in problem 1, the lines would probably intersect; however they did not know how this intersection related to the solution to the problem. Four students correctly concluded that the intersection would represent the solution to the equation. Only Student N correctly identified that both sides of the equation in problem 2 would be the same line. Four students correctly identified that no solution meant that the lines would be parallel; however, two of theses students reached this conclusion only after significant prompting by the researcher. In general, the students' difficulty with graphical representations of the equation seems to be due to a general lack of familiarity with the strategy, as well as a general lack of understanding of graphs in general.

Conclusions and Implications

Similar to Huntley, Marcus, Kahan, and Miller (2007), this study concluded that students experience difficulty solving identity and contradiction equations; however, students in the current study experienced much more difficulty solving the equation with a unique solution than students in the previous study. This difficulty is most likely linked to the extensive number of computational errors committed in the solving process. The difficulty students have solving identity and contradiction equations appears to be due to a combination of computational and conceptual errors. Some students made computational errors in the solving process, while other students performed sound algebraic manipulations, but failed to understand the possibility of a no solution or a solution of all real numbers.

Ultimately, this study suggests that students are not learning algebra with the understanding that the NCTM Learning Principle calls for. This study suggests that teachers need to be aware not only of computational errors, such as errors with the distributive property, simplification and arithmetic errors, but also logical errors in student reasoning. Solving linear equations is a basic skill necessary for success in the higher level mathematics courses that are now necessary for graduation in many states, and this study indicates that this is a basic skill that many students have not yet mastered.

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Effect of End of Course Testing on Teacher Use of Classroom Discussion

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It t is imperative to study how teachers incorporate discussion into the classroom while also addressing the required content as mandated by the rise in standardized End of Course testing. Hess (2004) acknowledges that there are many different definitions of what constitutes discussion in the classroom, but also asserts that at its core discussion is the exchange of ideas between people which is "based most fundamentally on the idea that something positive can occur when people are expressing their ideas on a topic and listening to others express theirs" (p. 152). There is already a wealth of research available on the use of discussion in the classroom, and the value of discussion has been established by several researchers (Aulls, 1998; Nystrand, Gamoran & Carbonaro, 1998, Larson, 1996; Larson 1997). However, none of these studies address how discussion is actually implemented in the classroom. The necessity to focus on content as a result of the teacher's goal of preparing students for Quarterly or End of Course testing takes up a significant period of time in a teacher's day, so teachers must be diligent and creative to ensure that there is still time allotted for discussion. This study will seek to see how teachers make time for discussion and facilitate it in their classrooms.

Definition of Discussion

There are many different definitions of discussion used by researchers. For the sake of this study, this definition will be used: discussion is the exchange of facts and opinions between at least two students and the teacher as a result of a direct question proposed by the teacher.

Conception of Discussion

The ways that teachers understand discussion may vary a bit form the definition provided above, though. Larson (1996) conducted a study which looked at how social studies teachers conceptualize discussion in which he looked at

teachers from schools which were located in different settings with varied student composition. From his interviews and observation, Larson composed a list of six different ways that teachers use discussion.

Benefits of Discussion

There have been a number of studies which have proved that discussion is a valuable tool to use in the classroom. In a case study of two teachers, Aulls (1998) found that students in Classroom A where the teacher used more discussion had much higher abilities to recall information than the students in Classroom B. Aulls concluded that discussion, especially discourse which is not heavily dominated by the teacher and focuses more on student thought, is very effective. Not only does it help recall, but it also helps students learn how to learn. Finally, Grant (1999) noticed that in a classroom where discussion was implemented more, the students were able make more sense out of how history relates to their lives. Grant attributed this to the more open-ended approach to the study of history which discussion allows for. On a similar note, Favero, Boscolo, Vidotto, and Vicentini (2007) found that in classrooms where discussion was used more often to study history, students developed a higher level of interest in history.

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Methods

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Emails were first sent out to teachers of social studies in the Winston-Salem/Forsyth County, North Carolina School system. The email asked if the teacher would be willing to participate in the study. Included in the email was a question about how often the teacher uses discussion in the classroom. From the respondents, three teachers were chosen based on how often they used discussion in the classroom. Data were collected from the teachers during interview sessions. The teachers were each specifically asked the following questions:

1. What is your definition of discussion? What does discussion look like in your classroom?
2. What techniques do you use to implement discussion in the classroom?
3. Why do you use discussion?
4. How often do you use discussion?
5. How do you decide what days you will (or should) use discussion and which days you will (or should) not?

6. Do most students participate in discussion?

7. What strategies do you use to get students who do not participate often do participate more?

8. How do you balance discussion with content?

The teachers were then observed to see how the ideas were actually implemented in the classroom.

Results

The study revealed two important findings. The first finding centers around the question at hand: how the need to prepare students for content focused standardized tests affects teacher use of classroom discussion. The study also revealed three different ways of using discussion in the classroom. I will first lay out what discussion looked like in each classroom before moving on to how test preparation affected the use of discussion in each classroom.

The three teachers studied will be referred to as "Mr. Red", "Mr. Blue", and "Mr. Green." All three teachers taught US History in Winston Salem/ Forsyth County Schools. I observed both standard and Honors level US History classes as well as one Seminar World History Class.

Portraits of Discussion

Mr. Red defines discussion as "an exchange of ideas involving more than one student" or more than one person. Each person builds on the other people's ideas. Mr. Red uses discussion for a variety of reasons. First, it is a good way to "just break up the monotony" of lecture. Mr. Red also values discussion because it allows for students to understand that there are often "several sides to stories." Furthermore, students feel more comfortable in a setting where they feel free to speak. Discussion allows them to feel free to express themselves and also allows them to develop confidence in expressing their own thoughts. Mr. Red does not have, in his words, a "formula" for sparking discussion. He simply presented students with questions on topics that "lend themselves" to discussion.

Mr. Green did not offer a definition of discussion but instead described his unique style of sparking discussion nearly everyday. Mr. Green begins class almost everyday with a journal question. Students are required to answer the question, often drawing on

personal experiences to do so. After they are done writing, they talk about it.. Mr. Green believes that through the discussions generated by the journal questions students are able to learn valuable lessons about life. Mr. Green believes that the point of teaching social studies is "to teach life lessons."

Mr. Blue defined discussion as an "engaged discussion between students with varying roles for the teacher". To spark discussion, Mr. Green asks open-ended questions and waits to see what the students have to say. He also has them discuss topics in small groups on a fairly frequent basis. This allows students to "build confidence so they are more willing to share in the larger groups".

Effects of Standardized Testing on Classroom Discussion

All three of teachers studied use discussion in their classrooms and consider it a valuable tool; however, all three agreed that the necessity to make sure that students are prepared for quarterly standardized tests means that they are unable to use discussion as often as they would like. Mr. Red commented that he thinks about the tests "all the time." He lamented that there were topics which the students wanted to discuss that were not related to the curriculum that that had to be skipped over.

Mr. Green had a similar response, saying that the tests are "always on the back of your mind" requiring "you to always stay on track." Mr. Green likened the class to "water-skiing." Generally, the teacher and students are "skimming along the surface" looking down at what is below the waterline, but they seldom have the chance to "scuba dive" and really get at the heart of the topics being covered.

Mr. Blue also believes that the necessity to prepare students for the standardized tests puts a damper on the amount of discussion he can allow in his classroom. The focus on test preparation leads to "abbreviated discussion." Because of it, "you can not go open ended every day." Mr. Blue tries to pepper his class with review to reinforce the topics and move in and out of discussion during class when he can. "US History is very specific", and testing "affects everything."

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Discussion and Implications

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Like other studies conducted previously, this study found that teachers believe that discussion is a valuable tool to use in the classroom. Some of the reasons why the teachers find discussion valuable, such as breaking up lecture and developing life lessons,

had not been previously reported. The definitions of discussions provided by the teachers involved are concurrent with the ways most teachers conceptualize discussion as reported by Larson (1996). The factors which affect a teacher's use of discussion are also similar to those suggested by Larson (1997).

This study has important implications for two groups: policy makers and teachers. The study clearly shows that the need to prepare students for their standardized tests has an adverse effect on teacher's ability to use discussion in their classrooms. If one of the main goals of teaching US History is to prepare our students for life beyond high school, to teach them to think critically, to be able to consider issues from different viewpoints other than their own, and to have the ability to communicate articulately and respectfully with others, then there is a problem with the structure of US History classes right now. Discussion is a valuable tool which allows students to develop each of the skills just named, but as long as there is such a strenuous focus on standardized testing, there is not enough room in the classroom for teachers to adequately use discussion. Education policy makers should keep this in mind as they decide whether or not to keep the standardized tests and, if they are kept, if so much importance will continue to be placed on the exams.

There are a number of implications for teachers which can be derived from this study. The three portraits of discussion will be helpful for any teacher, whether they are a new teacher wondering how to facilitate discussion in their classroom or a veteran teacher looking for a new way implement discussion. The portraits contain a number of creative ways to facilitate discussion. This is closely related to the second implication: because of the lack of time which teachers have to devote to discussion, they must be creative in the ways in which they bring in discussion during their lessons. A third implication of the study is that teachers need to be aware of why they are using discussion and what happens as a result of the conversation.

As a teacher, I will take all that I learned from this study to heart. I will strive to incorporate discussion into my lessons as often as possible to ensure that students are able to develop the higher order skills which are gained from discussion. I recognize that testing will affect the amount of time I have to devote to discussion, so I will be thoughtful and creative in the way that I incorporate discussion into my lessons to ensure that learning is not sacrificed. I will also make sure that I am conscious of why I am using

discussion. I will make sure that students are actually talking about the subject matter I wish them to discuss and gaining the knowledge and insights that I hope they are gaining. Some days I may use the discussion for simple content reinforcement, but on the days I plan on using discussion to teach higher order thinking skills I will make sure that students are not simply repeating content. Finally, if I make a commitment to using discussion on a near daily basis, then I will make sure that I am aware of how often it is used to ensure that I am meeting my goal of using discussion as often as I hope to use it.

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The Effect of Teacher Pedagogy on Student Engagement

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A major hot topic debate in educational research compares student centered and teacher centered pedagogical philosophies. Student centered advocates rave about the achievement and engagement of its students. As I begin to develop my pedagogical style, it is imperative that I consider the effect instructional techniques have on students. Similar to student centered advocates, I too desire high achieving and vigorously engaged students. The goal of this research, testing student centered claims, was explored with the specific research question, "Does teacher pedagogy determine student engagement?"

Review of the Literature

Teachers, researchers, and philosophers have dedicated countless pages to proclaiming the goodness of student centered pedagogy. Much of student centered research focuses on defining the concept and proving its positive results.

Student Centered practitioner and author James Kelly (1985) begins his book with a Chinese proverb, "I hear, and I forget; I see, and I remember; I do, and I understand" (p.1) Doing is imperative to student centered pedagogy. Student centered pedagogy testifies that students must be active participants in the learning process. Teacher centered pedagogy assumes the instructor's interpretation of the material and thoughts to be superior to the student's. In this style of classroom, students are passive recipients of knowledge and their role is to memorize, learn, and regurgitate information the teacher deems important or relevant. Student centered pedagogy is on the opposite end of the spectrum. With a better understanding of student centered pedagogy, a few questions arise. Why are countless authors, teachers, and philosophers so enamored with student centered pedagogy? What is the benefit to this style of teaching?

Martin Nystrand and Adam Gamoran, authors of "Student Engagement: When Recitation Becomes Conversation," concur that substantive engagement is the main

benefit of student centered pedagogy. Nystrand et al. differentiate between procedural and substantive engagement. Procedural engagement occurs in traditional (teacher centered) classrooms founded on recitation while the classroom routine consists of teachers asking questions, students answering questions, and teachers evaluating student responses.   Nystrand et al. assert that engagement in school procedures and routines does not represent meaningful engagement. In this style of exchange, students are not able to ask their own questions or have opinions about answers. The authors prefer substantive engagement that is elicited through student centered pedagogy; "The extent to which classroom discourse resembles conversation is in fact excellent criterion for judging both the instructional quality of the classroom discourse and the extent of substantive student engagement" (Nystrand et al, 1990, p. 16).   According to Nystrand et al. substantive engagement was not the only positive outcome of student centered instruction. Nystrand et al. concluded that engagement significantly effected academic achievement. Procedural engagement had an ambiguous relationship with achievement while substantive engagement had direct effects on academic achievement. Students whose teachers used open ended questions had higher scores in recalling information and depth of understanding more frequently.   Nystrand et al. (1990) make it clear that while students are more substantively engaged with student centered pedagogy, this type of instruction also had a positive correlation to academic achievement.

The third and final benefit of student centered instruction is outlined by Barbara Livdahl (1991) who asserts that teacher's domination in the teacher centered classroom prevents the student's capability of using language to learn. In a teacher centered classroom students spend most of the time listening and reading, they rarely get a chance to speak, think critically, or articulate their respective opinions verbally. Many teachers hesitate to relinquish control, viewing students as inferior, but Livdahl has developed a statuette that helps justify the way she structures her student centered classroom. One of Livdahl's main statuettes for teaching is that "talking and writing as well as reading and listening are valuable language learning tools" (Livdahl, 1991, p.3). This premise proves that allowing students time to talk and work together is not a waste of time but actually improves their language skills.

Methodology

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Subjects

The Wake Forest Graduate Education program works in conjunction with four Master Teachers from the Forsyth County Public District purposefully selected by a graduate advisor. These instructors represent a variety of teaching styles. Between the four teachers, four different formats of English classes are taught and observed: Advanced Placement, Honors, Standard, and a basic skills English class called "High School English." Classes range in size from 10 to 30 students and represent all four high school grades. The four Master Teachers consented to the researcher's non-participant observation research study upon agreeing to participate in the program.

Measures

This research study employed a qualitative non-participant methodology. The researcher observed 10 class periods of each of the four teachers. At the beginning of each class the researcher randomly selected 4-5 students in the classroom to observe for the duration of the period. The researcher kept track of the area/table of students observed in order to use a different group of students each time to control for extraneous variables. The researcher was not invested in tracking the engagement of the same students over time but rather was interested in identifying the **general** student response to the specific pedagogical methods used by the teacher. Every five minutes the type of pedagogy in use was classified as either teacher or student centered. In addition to writing down the type of pedagogy employed at each five minute marker, the researcher also wrote down the engagement level of each student being observed for that specific class period. The researcher classified engaged behavior as: initiating a response, asking/answering a meaningful question, displaying an alert body posture, and demonstration of class preparation. Disengaged behaviors included: lack of volunteering/participating, off task disruptions, staring into space, poor posture (slouching, head on desk, eyes closed), and lack of class preparation.

Analysis

The researcher will use various perspectives to track trends and make claims about the data. Through the use of graphs and anecdotal evidence, the researcher will explore the correlation between teacher pedagogy and student engagement. The four teachers were classified as teachers A, B, C, and D. The data for each teacher was

organized numerically: teacher A is 1, teacher B is 2, and so on and so forth. In reference to observation 3-2, the three corresponds with teacher C and the 2 denotes the second observation of teacher C. When percentage of engagement is referenced, the level of engagement was calculated based on the 4-5 students observed for that specific class period. For example, another way of saying that engagement remained above 80% would be that 4 of the 5 students were engaged at each of the five minute intervals when engagement and pedagogy were assessed and recorded.

Results

The first result identified was that while teachers' use a different combination of teaching methods, teacher centered instruction was used most frequently (Table 1), with an average of 65.8%. The different methods observed were teacher centered, student centered, and a mixed method approach which refers to class periods where the teacher used both student and teacher centered pedagogy.

Table 1: Teacher's Method of Instruction

Teacher	Mixed Method	Teacher Centered	Student Centered
A	22%	67%	11%
B	25%	13%	63%
C	17%	83%	0%
D	0%	100%	0%

The research also identified that there is not a significant difference in average levels of engagement per pedagogy type (Table 2). High and low levels of engagement occurred in both student centered and teacher centered lessons. Finally, data also displayed a range of engagement levels per teacher (Table 3).

Table 2: Pedagogy and Average Engagement

Pedagogy	Average Engagement
Teacher Centered	66.82%
Student Centered	71.11%

Table 3: Average Engagement by Teacher

Teacher	Average Engagement
A	53.04%
B	77.46%
C	76.12%
D	68.39%

Implications

      Results identified three claims and or trends. While student centered pedagogy has existed for over a century, the first identifiable trend (Table 1), confirms that contemporary classrooms remain teacher centered.

      The second claim is that neither student centered nor teacher centered pedagogy resulted in significantly higher or lower levels of engagement (Table 2). The averages in this table are calculated from each time the researcher recorded engagement level for student centered instruction and teacher centered instruction. There were 148 total recordings of engagement level for teacher centered pedagogy and 72 total recordings of engagement level for student centered pedagogy. The difference in average engagement for pedagogy is not significant.

      Further support for the claim that neither student centered nor teacher centered pedagogy produced higher/lower levels of engagement is demonstrated by observations 3-2 and 2-4. Observation 3-2, a teacher centered lesson and observation 2-4, a student centered lesson, both had remarkably high levels of engagement for the duration of instruction. On observation 3-2 students reviewed for a vocabulary quiz, took the vocabulary quiz, and worked on a vocabulary worksheet for the following week. This pedagogy was classified as teacher centered because it involved close ended rote memorization from students. The instructional activities on observation (2-4) involved an individual free writing assignment, sharing of the free write, and ended with a conversational and authentic class discussion. The prompt for the free write was "How do the choices you make affect you as a person, what is one choice you made? What kind of person would you have been if you had made the other choice?" This is an open-ended and student centered prompt because there is no right or wrong answer and multiple answers were acceptable. Despite the opposing instructional techniques, engagement remained above 80% for the duration of each respective class period.

      While engagement was alarmingly high for both of these class periods, Nystrand and Gamoran (see Literature Review) would classify the type of engagement in each class room as being different. Nystrand et al would define students in Teacher C's class as procedurally engaged because they are engaged in the routine but not engaged with the material. Nystrand et al. assert this type of engagement as inferior to substantive

engagement occurring in Teacher B's classroom. Observation 2-4 clearly illustrates this style of exchange. Unfortunately, the measures of engagement used in this study do not discriminate entirely between the two types of engagement. Perhaps a positive alteration to this study would be to assess engagement based on these two types instead of defined engaged and disengaged behaviors as this study did.

The third and final observed trend is that certain pedagogical practices do not consistently produce similar levels of engagement. This claim also confirms that pedagogical practices do not determine engagement. Even when two teachers implement the same pedagogical activities, the student response and levels of engagement vary. This claim is supported by observation 4-3 and 1-6. Both teachers D and A read passages out loud with their class together for the duration of the period but student engagement in each classroom is very different. The students in teacher D's class remain above 60% engagement level (observation 4-3) while engagement in teacher A's classroom remains below 60% for the period. Student's eagerness and willingness to participate in each of these classrooms was drastically different.

These three claims support the conclusion that student engagement is not determined by pedagogy. Other factors that could potentially contribute are classroom dynamic, student's level of conformability in the classroom, student teacher relationship, and teacher's execution of the pedagogy.

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A Qualitative Study on the Effects of Teachers' Use of Verbal Irony
on Classroom Tone

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Failure to recognize irony in a text or in media can result in severely skewed readings. In "The Ironies of Student's Recognition of Irony" (1999), Milner, J., Lynch, E., Carter, F., Coggins, J., Cole, K., Hodson, E., et al. suggest that teachers teach irony by using nonschool "instances of irony, such as jokes and music, as a starting point in the classroom" (p. 313). However, it seems likely that many teachers non-deliberately use verbal irony or sarcasm in the classroom as they communicate with their students.

Review of Literature

An understanding of irony is vital to human communication, as well as a full understanding of literature. In "Children's Understanding of the Meaning and Function of Verbal Irony," Dews, Winner, Kaplan, Rosenblatt, Hunt, Lim, et al. (1996) suggest that "Irony is a common feature of everyday discourse…With verbal irony, speakers convey their feelings indirectly" (p. 3071). And so, a person who is not proficient in recognizing ironic statements is at a significant disadvantage in understanding others.

Dews et al. (1996) describe two major functions of verbal irony, the first being a muting function. Dews et al. (1996) explain that "Irony mutes the implied criticism (in the case of ironic criticism) or the implied praise (in the case of ironic compliments). The second function of irony is to allow the speaker to say something with humor, "That is, ironic utterances are perceived as more humorous than their literal paraphrases. By speaking humorously, speakers may demonstrate that they are not upset" (Dews et al., 1996, p. 3072).

Despite evident effort to integrate this literary technique into curricula, irony continues to prove elusive to students. Milner et al. (1999) cite multiple studies, all of which find "that although students have mastered basic comprehension skills by the time

they reach middle school, they remain hampered by a literalism that causes metaphors and symbols to confuse them" (p. 309). Though a good grasp on the concept of irony is important to communication, as well as a full understanding of literature, it continues to prove a difficult concept for students to master.

Various definitions generally share the view that irony is an instance in which a speaker says a thing, but means the opposite, and that verbal irony is a deliberate use of figurative language, and never a mistake. In "An Acquired Taste: Children's Perceptions of Humor and Teasing in Verbal Irony," Pexman, Glenwright, Krol, and James (2005) explain that irony requires "inferences about first-order belief (what the speaker believes) and second-order beliefs and intentions (what the speaker intends the listener to infer about the statement)" (p. 260). Similarly, Dews et al. (1996) point out that "It has been argued that irony is more difficult to understand than metaphor because to understand irony one must grasp the speaker's actual (though unstated) beliefs, and the speaker's beliefs about the listener's beliefs" (p. 3083). Where Dews et al. tend to attribute the better performance of older children on tests of irony comprehension to later stages of cognitive development, Pexman et al., like Milner et al., tend to attribute this replicable phenomenon to environment and social learning.

Milner et al.'s study reports an "amazing difference for most students between recognition of irony in simple jokes and in more complex poems" (p. 309). It is unsurprising, therefore, that the "five-stage progression of instruction based on these results" (1999, p. 312) Milner offers recommends that teachers move "from the ease of recognizing irony in jokes and other informal language to helping students recognize somewhat obvious irony in two or three stories" (1999, p. 313).

Methodology

Subjects:

This is a qualitative study. The subjects include four purposefully-selected English teachers and their classes at a secondary school in Forsyth County, North Carolina. Teachers were selected based on experience and expertise as cooperating teachers in the Master Teaching program at Wake Forest University.

Measures:

Ten classes taught by each of the four teachers were observed, totaling 40 class observations. A total of 31 classes were included in data analysis. Observational field notes were taken that identify *ironic comments or questions* or *sarcastic comments or questions*. Ironic questions and comments are operationally defined as an instance in which the teacher's intended meaning is the opposite of his or her spoken words. Sarcastic questions or comments are operationally defined as ironic comments, directed toward a specific person or group, which are clearly aggressive, critical, or belittling. Verbal irony is divided into these two subcategories because it is likely that each will have a very different effect on the overall tone of the classroom.

At the beginning, middle, and end of each class period, the researcher assessed three major aspects of classroom tone: the extent to which students were engaged, respectful, and convivial. Results were registered on a Likert Scale of 1 to 7. For example, when recording the students' level of engagement, a score of one will mean that students were very disengaged, and a score of seven will indicate that students were very engaged.

Markers of student engagement include the number of hands raised in a class period, the number of children sleeping or resting their heads of desks, obvious signs of alertness, such nodding and eyes on the teacher, and the number of times the teacher must stop class to suppress conversations unrelated to the lesson at hand.

Markers of student respect include listening when the teacher or other students are speaking, refraining from outbursts, refraining from insulting or belittling behavior, and giving compliments.

Markers of student conviviality include the warmth of student communication with the teacher and other students, apparent familiarity with each other's lives and personalities, informality of communication, and earnestness/openness of communication in the classroom.

Findings

The numbers generated from this study indicate the great difference in frequency between teachers' inadvertent use of verbal irony in the classroom. Teacher C ranged from zero ironic statements in a class to 4 ironic statements, with an average of 1.667 ironic statements, overall. Teacher A's use of irony was similarly infrequent, ranging

from zero ironic statements per class to 9 ironic statements, with an average of 2.333. Teachers B used irony more frequently, with a high of 13 ironic statements in a single class and an average of 8.625 ironic statements. And Teacher D used irony most frequently, with a high of 28 ironic statements and an average of 14.4 ironic statements per class.

There were very few sarcastic statements, which were operationally defined as ironic statements, directed toward a specific person or group, which are clearly aggressive, critical, or belittling, made by any teacher. It should be noted here that the sarcastic comments that were made by observed teachers were not generally aggressive or belittling, but merely critical. The highest number of sarcastic statements in a single class was 5, made by Teacher A. Teacher D, however, had the higher mean number of sarcastic statements, with 0.6 sarcastic comments per class. Teacher C, who also had the lowest mean number of ironic statements, made no sarcastic statements during observations. Please see the following chart for more detailed information.

Teachers' Average Number of Ironic and Sarcastic Comments, Presented alongside Average Scores for Student Engagement, Respect, and Conviviality

	A: # Ironic	A: # Sarcastic	A: Eng.	A: Res.	A: Conv.	B: # Ironic	B: # Sarcastic	B: Eng.	B: Res.	B: Conv.	C: # Ironic	C: # Sarcastic	C: Eng	C: Res.	C: Conv.	D: # Ironic	D: # Sarcastic	D: Eng.	D: Res.	D: Conv.
Series1	2.333	0.555	4.222	4.888	5.111	8.625	0.375	5.333	5.458	5.5	1.667	0	5.333	5.889	5.444	14.4	0.6	6.367	6.467	6.3

Average Numbers and Scores (y-axis)

Comment Types and Student Response (x-axis)
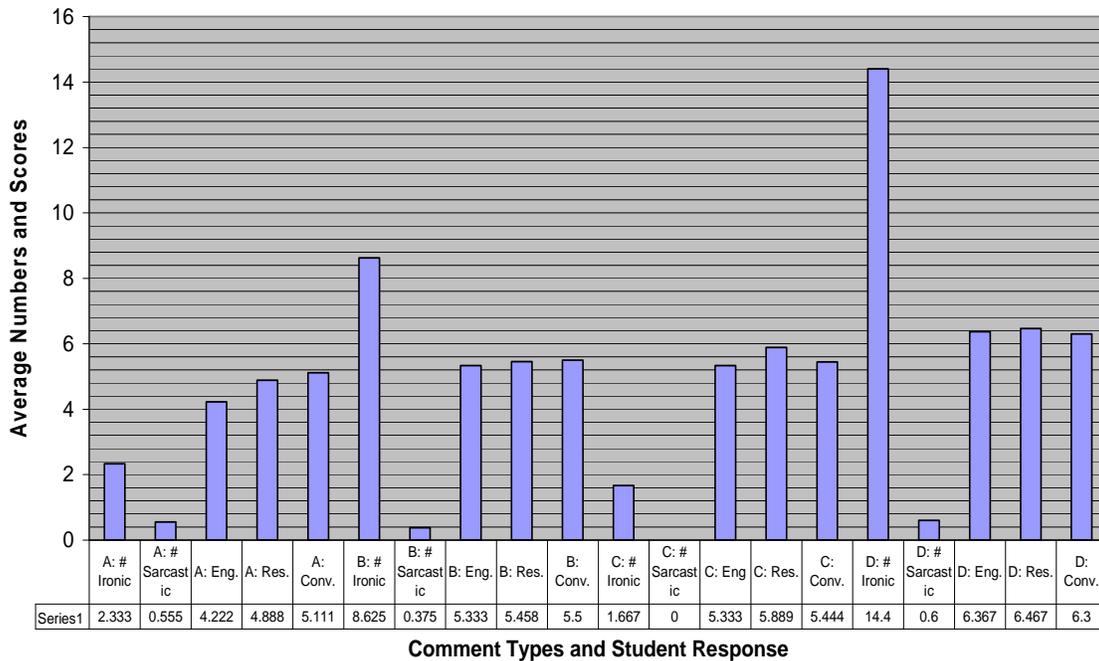
Implications

As is stated in the "Findings" section, Teacher D had the highest average number of ironic comments (14.4), followed by Teacher B (average of 8.625 ironic comments), then Teacher A (average of 2.333 ironic comments), then Teacher C (average of 1.667 ironic comments). Teacher D also had the highest composite score for classroom tone: 6.378. However, Teacher C, who had the second-highest composite score for classroom tone (5.556) had the *lowest* average number of ironic statements per day (1.667). Because of this contradiction, the numeric data generated by this study fails to establish a clear relationship between teachers' inadvertent use of verbal irony and the quality of classroom tone.

However, general observations made by the researcher during this study still render some useful information on teachers' use of irony. Teacher B's use of irony was far different from Teacher D's. While Teacher D primarily exploited the humor function of irony, Teacher B primarily used irony for its muting function. Teacher D tended to make deliberate ironic jokes, while Teacher B's ironic statements tended to be hyperbolic expressions of exasperation. This softening of criticism or anger through irony fits Dews et al.'s description of irony's muting function.

Teacher D, who used the most irony and did so effectively, was very uneven in making ironic statements. Though Teacher D's maximum number of ironic statements in a single class was 28, Teacher D's minimum number of ironic statements in a single class was 1. Teacher D teaches classes ranging from honors to remedial levels, and use of irony varied noticeable by class level. While Teacher D's use of irony was lavish in honors classes, Teacher D was extremely sparing with use of irony in remedial classes.

Comments made by Teacher D suggested the belief that students in honors classes tend to be more confident, and so can tolerate the joking criticism of Teacher D's verbal irony. Other comments made by Teacher D suggested the belief that students in remedial classes lack this confidence, and so, Teacher D made fewer ironic comments in these classes. Meanwhile, Teacher B tended to use similar amounts or irony, no matter what the class level. This might indicate merely that Teacher D is more conscious of irony usage in the classroom than Teacher B. It is, however, noticeably aligned with Dews et

al.'s suggestion that appreciation for irony's humor function might require increased cognitive ability and skill. Students who subconsciously grasp the muting function of irony might have trouble with the more sophisticated humor function.

Above all, it should be noted that the teachers who used more irony seemed more obviously comfortable with their students, and vice versa. The relationship between teacher and student in these classrooms tended to be warmer, and classes tended to be zestier, if not always focused primarily on the lesson at hand. This might show that teachers' use of irony or other forms of figurative language in class indicates a greater level of comfort in students' presence, or a preference for informality.

Greater study of the effects of teachers' inadvertent use of verbal irony is recommended. Future studies should include a greater number of subjects and multiple researchers to ensure greater objectivity.

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The Effects of Calculator Use on Solving Systems of Equations

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More and more we see technology appearing in even the smallest facets of everyday life. Our calendars are no longer on paper, but programmed into our mobile phones. Any song we want to hear or video we want to see is just a click away. Cars can actually speak to us to direct us where to go or prevent us from backing into something. Computers are able to find the largest prime number, containing around 12.9 million digits. The classroom is no exception to this bombardment of technology.

In the United States, National Education Technology Standards (2000) have been set forth by the International Society for Technology in Education. According to the National Education Technology Standards for Teachers (NETS*T), the teacher must have a strong understanding of technology and its uses and continually stay up to date on the latest technology classroom integration through workshops and seminars. There is a separate, but connected set of standards for students, called the National Education Technology Standards for Students (NETS*S). These Standards call for students to develop important life skills (such as communication and collaboration) while learning to utilize technology and becoming digitally conscious citizens. The National Council of Teachers of Mathematics includes Technology as one of its six Principles for School Mathematics (NCTM, 2000). The Council considers technology "essential in teaching and learning mathematics" and suggests that it "enhances students' learning" (NCTM, 2000, p. 24). For teachers who are perpetually trying to engage students, technology has provided an extra venue through which to accomplish that goal.

Review of Related Literature

Research on technology integration in the classroom overall seems to show that technology benefits the students who use it. In mathematics classrooms, the most widely-used technological resource is the calculator, and in higher level mathematics, the graphing calculator. In a meta-analysis of forty-two studies, Ellington (2006) determined

that students who were taught mathematics using graphing calculators *always* outperformed students who were taught without them. Another study found that "the more access students had to graphing calculators, and the more graphing calculators were used during algebra instruction, the higher the students' end-of-course test scores (taken without the use of calculators)" (Heller, Curtis, Jaffe, & Verboncoeur, 2005, p. 18).

Graphing calculators also have an impact on students outside of raising achievement. Ellington (2006) determined that students have more positive attitudes about learning mathematics when they are taught with graphing calculators. Hollar and Norwood (1999) compared an experimental class which integrated calculators and a control class which did not use calculators. A post-test attitude survey revealed that students in the experimental group had more positive attitudes about math and their abilities than the students in the control group.

While research shows that calculators benefit both achievement and attitudes, not everything about calculator use is as good as it seems. While calculators overall are a positive tool for the 21st century, the overuse of calculators can be harmful to students as research has shown that calculators can have a negative effect on certain types of test items (Bridgeman, Harvey, & Braswell, 1995). A study by Watson and Ciesla (2006) showed that the calculator actually produced incorrect results for some upper-level math problems involving the calculation of complex roots. Brown, Karp, Petrosko, Jones, Beswick, Howe, & Zwanzig (2007) conducted research that consisted of a questionnaire in which many teachers agreed both that "the use of a calculator enables students to get answers without understanding the process," and "students who use calculators blindly accept the results" (p. 106). Thus teachers recognize that calculators, in addition to the benefit they provide to many students, can also have negative effects. Without the appropriate base knowledge, it is likely that students will not be successful in mathematics if they rely on their calculators to do everything for them.

This study will specifically examine students' use of calculators when solving systems of equations. It is important to examine when and why students are turning to their calculators for these problems. Technology is vital in the classroom, but only when used appropriately. Students must not simply know how to "plug and chug" to produce solutions from their calculators, but should be able to solve problems manually,

developing their problem solving and critical thinking skills. This study seeks to determine whether high school students are able to solve systems of equations with and without a calculator in order to describe their level of dependence on the calculator.

Methods

The subjects in this study were seventeen Honors and non-Honors Algebra II students at two public high schools in a diverse school district in North Carolina. The students who participated in the study were randomly selected from the group of students that returned signed parental consent forms. Each participant was asked to complete four algebra problems developed by the researcher, each of which involved solving a system of equations with two variables. On the first two problems, students were not permitted to use a graphing calculator. On the second two problems, students were permitted but not required to use a graphing calculator. Students were audio recorded and asked to talk aloud and explain their thought process as they completed the problems. The researcher analyzed each student's results and methods of solving systems of equations, using constant comparison to look at each student's response, whether correct or incorrect, and their reasoning for solving the system in the manner they chose.

Results

Students in this study were found to represent both ends of the spectrum of calculator use. While some were very dependent on their calculators, others chose not to use the calculator when given the option. Also represented were the students in the middle, who computed the problems by hand and then turned to the calculator to check their answers.

The students who are labeled in this study as very dependent on their calculators are those who were only able to solve the systems of equations with the calculator and did not know how to do any computations manually. Eleven of the seventeen students interviewed fit into this category. These students pondered the calculator-inactive questions for a brief period before either asking permission or accepting the suggestion to come back to them later and move directly to the calculator-active problems. While some students recalled well how to use the calculator to solve the problems, for others it was a challenge.

The first issue that presented a problem for these students who were very dependent on the calculator was remembering what data they needed to enter into the calculator. Of the eleven students considered very dependent, four did not recall how to use the calculator correctly. The method the students were trying to use was entering matrices into their calculator (see Figure 1). First, they should enter the coefficients from both equations into a two-by-two matrix. Then, they should use a two-by-one matrix to enter the values from the right sides of the equations. They should then compute $A^{-1}B$ to achieve the final matrix, which would give them the values for x and y. One student was

Figure 1

$$\begin{matrix} 2x + y = 8 \\ 3x + 2y = 2 \end{matrix} \rightarrow A = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} \rightarrow B = \begin{bmatrix} 8 \\ 2 \end{bmatrix} \rightarrow A^{-1}B \rightarrow \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}^{-1} \begin{bmatrix} 8 \\ 2 \end{bmatrix} = \begin{bmatrix} 14 \\ -20 \end{bmatrix}$$

able to set up matrix *A* and matrix *B*, but then did not recall using the inverse and was unable to complete the problem. Another student began entering data in a two-by-one and then a three-by-two matrix and quickly discovered the matrices were unable to be multiplied. Two other students did not attempt to use matrices and tried to find the intersection of the two equations. However, they were not able to successfully solve for y in order to enter the formulas for the lines into their calculators. A few students struggled to remember where the *Matrix* button was located on their calculator, but were eventually able to find it.

Another problem for the students who relied on the calculator was knowing how to represent their answers based on the solution the calculator gave them. Of the seven calculator-dependent students that correctly used the matrix method, two of the students gave their final answer in matrix form and did not state which value represented x and which value represented y, though the directions explicitly said to solve for x and y. Another student wrote only the solution for x and neglected to find a solution for y. The last problem on the page, for which the solution was a fraction, threw off many students. While four of the students simply turned the decimal solutions in the matrix into fractions using their calculators, two students rounded off to decimals. One student rounded the decimals and then converted those numbers into the inaccurate fractions x = 85/50 and y = 29/25 instead of x = 5/3 and y = 7/6. One student also got the answer incorrect by copying the wrong solutions from the calculator, giving the answers to be x = 15/3 and y = 17/6.

The students on the opposite end of the spectrum were those who chose not to use the calculator at all or chose to use the calculator minimally. These students solved the problems by using the elimination and substitution methods. Of the four students who chose to solve all of the systems of equations manually, only two students checked their answers with the calculator once they were done. One student who did not check his answers with the calculator left part of his answer to the fourth problem in the form y = 2.33/2, which would be considered an unacceptable answer by most teachers. Another student who did not check answers provided a solution only for y in each equation, leaving each problem incomplete. It is interesting to note that using the calculator for problems 3 and 4 may have been the faster method, yet the students chose to do them by hand anyway.

The students interviewed for this study were taught by one of two teachers. Teacher A is reluctant to use calculators in the classroom, while Teacher B integrates calculators into instruction often. The eleven students who were considered to be very dependent on the calculator were students of Teacher B, and the four students who chose not to use the calculator or only used the calculator to check solutions were students of Teacher A. One student from Teacher B's class did problems 1 and 2 by hand using the substitution method and problems 3 and 4 with the calculator using matrices.

Conclusions and Implications

The results of this study show that the extent to which students use the calculator largely depends on what they have been taught in the classroom and on their teacher's preference for or against calculator use. This means that teachers have a powerful influence over their students and the decisions their students make when solving math problems. Based on these results, it would be easy to determine which teachers are utilizing calculators in their classrooms and which are not, simply by testing each teacher's students and seeing which methods the students use to complete the problems.

As the results indicated, the students in this study were largely on one end or the other of the spectrum of calculator use. Only one student out of the seventeen was able to complete the first pair of problems by hand and the second pair of problems by utilizing the calculator. The results achieved by this student are the ideal results for all students, that they understand and know how to think critically to solve problems manually while

also knowing how to use technology to their advantage when that option is available. The danger of not utilizing the calculator effectively is falling behind in the use of technology. The danger of using the calculator too much is not thinking critically and understanding the process of solving the problem. Another problem is relying on the calculator and yet not remembering how to use it. Students, who have simply memorized what buttons to press on their calculators for a test, yet do not recall the steps or reasons behind finding their solutions, are at risk of forgetting how to use the calculator to solve the problem when the material is not very fresh in their minds. On the other hand, if a student truly understands the reasons behind the steps in solving a problem, they are far more likely to remember the steps for solving it on the calculator. Teachers should make sure that their students understand how to solve problems by hand and then introduce them to the use of technology that is so important in the 21st century.

More research needs to be done on why students choose to use or not use a calculator to solve a mathematics problem. Results for this study would be more generalizable if there had been more subjects interviewed and if there were more students selected from multiple teachers, rather than just two. Further research could examine the differences between the choices made by several teachers' students in order to better understand how much teacher effect exists.

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The Effect of Student-Centered Projects in World History
on Learning and Enjoyment

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There are two generally accepted schools of pedagogy: student-centered and teacher-centered. The more progressive and modern approach, student-centered instruction, is also known as learner-centered and constructivist, and generally encompasses activities described as discovery, active, engaged, and cooperative learning, all of which terms are interchangeable in this study (Mraz, 2006; Mattingly & VanSickle, 1991; Siler, 1998; Barker & Bills, 1999). If learner-centered instruction were always implemented effectively, students would succeed in and beyond the classroom.

Literature Review

In 1997, the American Psychological Association (APA) Presidential Task Force on Psychology in Education published a list of 14 principles of learner-centered instruction (1993). The principles include five groups of factors such as cognitive and metacognitive, motivational and affective, developmental and social, and individual differences (APA, 1993). APA developed these research-based principles for use in schools to better educational design (1993). "Cooperative learning" is one of the terms used by teachers and researchers to define activities in the classroom that involve working with peers to create a finished product (Mattingly & VanSickle 1999; Shultz 1995). According to Barker (1999), engaged learning "centers on [...] tools to assist teachers in helping students take responsibility for their own learning, become knowledge explorers, and collaborate with others to find information and to seek answers to problems" (p.1). Siler (1998) reminds readers that in elementary school, "students are typically engaged in active learning; however, as students progress into middle school, high school, and college, their teachers use less activities-based instruction and more 'intellectual' classroom methodologies" (p. 2). Other researchers have found that projects that either simultaneously assess different intelligences or ones that gives

students choices have proven effective (McMurray, 2008). Furthermore, in Hoostein's (1994) study on motivational strategies used by teachers in history classrooms, he discovered that providing activities and opportunities for active participation were the most widely practiced strategies perceived by both student and teacher to increase student motivation.

Student-centered activities or projects influence students' memory of the material, add social aspects to learning, and provide a facet for differentiated instruction for students with multiple intelligences (Bandura, 1965; ERIC/OSEP Digest Committee, 2003;Gardner, 1983; 1993; 1999). On a holistic level, Fraenkel (1995) found that effective social studies teachers among other things, use a variety of activities for engaging students. For the purposes of this study, a student-centered project is any activity in which students create a finished project, whether in class or at home, individually or in groups. This study looks at the effectiveness and impact of projects on student learning and enjoyment of World History as perceived by students and teachers.

Methodology

This study included classroom observations, student surveys and teacher interviews. Three teachers were selected, with varying levels of teaching experience, located at different schools and teaching three different levels of classes. Teacher 1 has been teaching for 11 years following a 15 year career in business. She has an MBA as well as a Master's in Education. She currently teaches Honors and AP World History and a business course on traditional schedule at a predominately white high school in a middle class town in North Carolina. Traditional schedule means that students have 7-8 period days and they typically take the same core classes throughout the year. One of her Honors courses, composed of 28 students, was observed for this project. Teacher 2, a first year teacher, teaches AP World History and AP Government & Economics also on traditional schedule; her AP World History course of fifteen students (12 males, 3 females) from grades 9, 10, 11 and 12 was studied. The school at which Teacher 2 works is a branch that offers Advanced Placement courses, career technical courses, and normal curriculum courses to students in high schools all over the county. Students, mostly high school juniors and seniors, travel between their high school and this specialized county branch. Teacher 3 is a second year teacher with a Master's in Education teaching

Standard level, 9th grade World History class of 14 students (11 males, 3 females) on block schedule. Students on block schedule take only 4 semester long courses each day. He works at a technology magnet school in which three separate "schools" are within one school building. Classroom observations were conducted on a project day for Classes 1, 2 & 3 and also on a non-project day for Class 1 to see student-teacher interactions and student affect toward the project. Class 2 was also observed on the project presentation day. At the end of each project, the teachers distributed the surveys using likert scale and free response for students to complete regarding the project.

Results

The students of Class 1 went to the computer lab to work on a SAS project on Ancient Greece. SAS Curriculum Pathways is a web-based resource to be used as an "online *partner* for teaching the core curriculum" (SAS, 2008, online). SAS Curriculum Pathways has curriculum resources for English, history, science, mathematics, and Spanish. It is full of "learner-centered tools, lessons, and resources with measurable outcomes; Interactive components that foster higher-order thinking skills; Twenty-first century skills integrated into content" (SAS, 2008, online). This project was the 6th of its kind that had been assigned this semester. All of the necessary online materials needed to complete the project and research were given.

Students of Class 2 were doing a poster project on Asia in the Middle Ages. Teacher 2 hand picked the four student groups and assigned them a country to study: either China, Vietnam, Korea, or Japan. She wanted mixed ability levels in each group, with at least one bright and motivated student per group. She also wanted to split up the girls and age groups. Students were given three days of class time to do research, find images in the computer lab, and prepare their poster to "teach [their] country to the rest of the class" on the fourth day. No outside class time was required.

Students of Class 3 were studying the Chinese dynastic cycle. Teacher 3 created a series of activities and worksheets including a reading assignment and a graphic organizer.

The majority of students responded that they learned something from the activity, would repeat it, and enjoyed the subject matter covered. 11 students in class 1 (39%), 11 in class 2 (80%), and 8 in class 3 (62%) "somewhat" liked the project or activity. Total,

42 out of 55 students surveyed at least "somewhat" liked the project, meaning they gave a score of "somewhat," "liked it," or "loved it." Concerning enjoyment of the project, Teacher 1 mentioned in her interview that her intention is not necessarily for students to love the work, but to learn from it. However, Teacher 1 believes students enjoy projects overall because students are proud of their products and communicate a deeper level of understanding on their tests. Teacher 2 knew from the beginning that students might not love the project because, "Some of the students think they're smarter than they actually are." Teacher 3 thought that students may express disdain at doing "worksheets" everyday, but it challenges them to really think and get involved in the material.

When asked if students enjoyed the subject matter covered in their world history project or activity, 20 responded that they liked it "a lot," and fifteen responded "somewhat." Overall, students agreed that this project helped them to learn. 49 out of 55 students surveyed (89%) responded that yes, this project helped them learn. Some said that the organization, structure, and presentation helped their comprehension and understanding of the subject. All three teachers agreed that projects and student-centered activities help students learn. Teacher 3 finds it effective, because "otherwise [he] wouldn't do it." Teacher 2 in her interview also mentioned that "Students learn better when they teach themselves."

When asked if they would like to repeat the project, the majority of students (33) replied affirmatively. Students in all three classes thought the project was easy and they liked the change from a normal class day, both reasons they would like to repeat the project. At least one student in each class did not want to do the project again.

In all three classes, at least one student mentioned that they looked forward to his or her World History class because the material is interesting, they like history and they like the teacher. Most students (25 out of 48 responses) said that they felt that history applies to their lives today. 16 students did not believe world history applied to their lives and the most common reason why was because they did not think they need it in everyday life. 15 students in Class 1 thought that history applied to their life because as. one student said, "the past affects the present."

Implications

        The teachers incorporated student-centered projects and activities effectively. Effective projects should challenge students, enhance their grasp of the material, increase their interest in the subject matter, and allow creative outlets for students of a variety of learning styles. Since the majority of students responded that the project helped them learn and some of the students most enjoyed creating the finished product, the projects were a success. The responses, however, were mixed as to the level of challenge that each project or activity provided. Students complained of the assignments being both too easy and too hard. Further study and better definition of what classifies as "easy" or "hard" is needed to make any further claims based on this study. As far as increasing their interest in the material, many responses implied that students had made up their minds about the material before the project commenced. The different levels of classes and specific subject matter seemed to influence the student responses as well, but more research is needed to prove it.

        Overall, students enjoyed student-centered activities and projects compared to normal class time. Observation of these three classes shows that student-centered projects and activities can be a great way to integrate a variety of assessments into the classroom to appeal to multiple intelligences and ability levels. Students' responses regarding why they did or did not like the project fit into related categories of different intelligences and learning styles.

        The weaknesses of this study lie mainly in the small student numbers and the total years of experience of the teachers. Only 55 total students were surveyed and observed, but the classes themselves represented students from diverse backgrounds and of varying ability level. A few of the students surveyed were English language learners. Two teachers combined had three years experience compared to one teacher's 11 years of experience.

        Future research might want to look at the effect of class composition and culture on the motivation, enjoyment, and understanding of history as related to projects and the subject matter itself. The three classes observed were three different schools, from three different types of background, and were three different levels. These factors could influence students' responses on the survey to a great degree.

The projects and activities implemented by Teachers 1, 2, and 3 are great models to follow in my own classroom. Teacher 1 tries to break up lecture time by designing her lessons with ample student-centered time in the computer lab, library, or class in reading groups analyzing primary sources. Teacher 3 presented an example of how to individualize instruction in a class in which students have a variety of ability levels. Most helpful of all was watching how various projects and activities were implemented in the classroom and those that teachers have assigned successfully.

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Text Length and Student Engagement: A Study of Differing Student Engagement with Short and Long Texts

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High school English classrooms spend a lot of time having students engage with fictive texts. Student engagement with these texts is often affected by the length of the text. Some students are more responsive to the longer texts of novels and plays while others are more responsive to the shorter texts of short stories and poems. This difference in engagement and responsiveness comes from a variety of sources. Some students are more likely to engage characters and ideas over a longer period of time, and will therefore engage with longer texts; other students may have affective filters that inhibit them from engaging with long texts because they are "too hard" to read simply because they are long. These students are more likely to engage with shorter, more immediate texts like poems and short stories. This report offers insight into which text length, long or short, is most likely to garner high student engagement in upper and lower level classrooms.

Review of the Literature

While there is a wealth of literature available that offers insights into how to engage students with texts and reading, there is little focus on the length of the texts being taught and any affect that may have on student engagement. In *"You Gotta BE the Book:" Teaching Engaged and Reflective Reading with Adolescents* Wilhelm (1997) describes a scene in his classroom where his students quickly lose interest in what they are reading and become disengaged and off task. The work in question is a longer piece, which may suggest that his students were not engaged with longer works. A further insight into the possible importance of text length for lower level students comes from Sheridan Blau (2003); Blau cites a powerful tool to reading comprehension: rereading. However, most students are not likely to reread a novel or play due to its length, and are

therefore less likely to comprehend it and are even less likely to be engaged with the text in class. Short stories and poems, due to their length, are easier to reread and students may therefore take the time to reread and comprehend the work.

Despite a wide range of studies that have been conducted concerning student engagement, none of them have directly addressed the affect that text length has on student engagement. There is also no conclusive study or report that suggests that lower level students are more likely to be engaged with short texts and higher level students are more likely to be engaged with long texts. However, current literature shows that there is a difference between student engagement with different lengths of text on some level. This study seeks to add to that pool of understanding.

Methodology

Participants

Four secondary English teachers and their classes were observed during the course of this study. Each teacher teaches a variety of classes, with classes from ninth grade English I to twelfth grade Advanced Placement Literature observed. None of the four teaches all grade levels or ability levels, but each grade and ability track was observed throughout the study.

Data Gathering Procedures

All data was gathered through non-participant observations. Each class was observed using an observation worksheet that included information about which teacher was being observed, the grade level and tracked ability level of the class, what text was being taught, and the type and length of the text. The tracked level of each class was recorded as being either "high" or "low," with "high" referring to honors or Advanced Placement classes and "low" referring to remedial or standard classes. The length of the text being studied was recorded as "short" or "long," with poems and short stories recorded as "short," and novels and plays recorded as "long."

Student responses during class discussions or other class work with fictive literature were observed and classified as exemplifying either "high" or "low" engagement. Three markers of high engagement were used: a student offers a voluntary response to the teacher's question, a student asks an authentic question of their own or poses an original authentic statement, and a student responds to either a question or

statement made by a peer. Three markers were also used for low engagement: a student only responds to a question or statement when he or she is called on by name by the teacher, a student offers only "I don't know" as a response, or there is no response from the class at all, and a student engages in an off-task activity such as sleeping, sending text messages on a cell phone, off topic talking to a peer, clearly not paying attention, doing work for other classes, or any other activity that is not related to the task at hand. Due to the usual tendencies of some high school students and the researcher's physical position in the classroom during observations, the researcher acknowledges that it is unlikely to observe and record every instance of off-task activities in a classroom.

Analysis

The numerical data that was collected was analyzed using a Microsoft Excel Spreadsheet. The percentages of the total number of engagement markers observed were calculated for high and low engagement for four groups of data: high level students with short texts, high level students with long texts, low level students with short texts, and low level students with long texts. Excel was also used to create visual graphs to depict the trends observed.

Results and Conclusions

Results

Over the course of the fall semester of 2008, four Master Teachers were observed during ten classes each. From these forty observations, there were fourteen class periods observed during which the teacher taught a fictive text. However, despite the low number of occurrences of students and teachers discussing and interacting with literature, there were visible trends. Of the fourteen classes during which data was collected, one class was high student ability level discussing a long text, six were high student ability level discussing a short text, three were low student ability level discussing a long text, and four were low student ability level discussing short texts.   The class periods that were observed where fictive texts were taught were not evenly spread between the four different teachers, despite the researcher's attempts to do so.

A guiding hypothesis for this research was that high ability students would be more engaged with long texts than short texts and more engaged overall than low ability students, and that low ability students would be more engaged with short texts than long

texts and less engaged overall than high ability students. The data trends back up part of this, as low ability students had a higher percentage of acts indicative of high engagement with short texts than long texts. However, high ability students had a higher percentage of acts indicative of low engagement with long texts than short texts, as can be seen in Figure 1.

Percentage of Engagement Acts Observed by Ability Level and Text Length
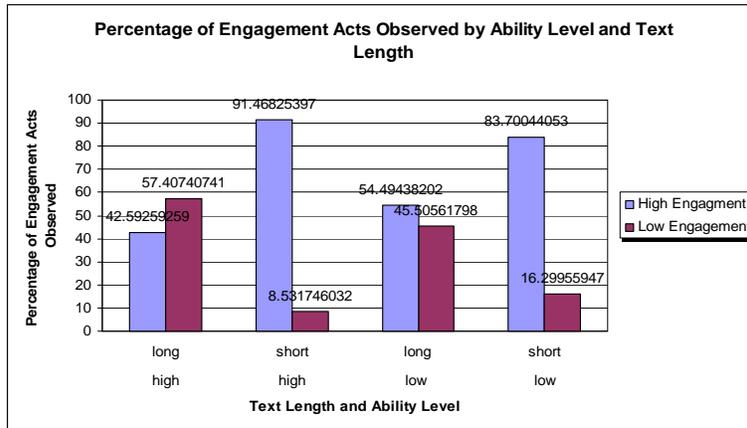
Figure 1

As this graph shows, both high and low ability students were more engaged with short texts than long texts, based on the percentage of total engagement acts that were observed with each text length. An overwhelming 91.4 percent of high ability students' engagement acts with short texts were acts of high engagement, while only 42.6 percent of high ability students' engagement acts with long texts were acts of high engagement. 83.7 percent of low ability students' engagement acts with short texts were acts of high engagement, and 54.5 percent of their engagement acts with long texts were acts of high engagement.

Overall, regardless of the length of the text being discussed, 86.7 percent of high ability students' engagement acts were acts of high engagement, and 13.3 percent of their engagement acts were acts of low engagement. Low ability students' engagement acts showed that 70.9 percent of all engagement acts were acts of high engagement, and 29.1 percent of all observed engagement acts were acts of low engagement. While both levels of students were observed completing more acts of high engagement than low engagement, high ability level students, overall, showed a larger percentage of acts of high engagement than low ability level students.

The data were further broken down to examine the specific types of engagement acts that were observed in high and low ability level classrooms with short and long texts in order to solidify the picture of students' engagement with texts. The two most commonly observed engagement acts for high level students studying long texts were students making a voluntary response to the teacher's question, which represented 39 percent of observed engagement acts, and students engaging in off task activities, which represented 37 percent of observed engagement acts. Overall, there was a higher percentage of low engagement acts observed in this particular class. The overall attitude of the class, as far as the researcher can tell from the observations, can be summed up by one student's mumbled response of "I don't know, and I don't care" to one of the teacher's questions.

High ability students studying short texts were observed more than high ability students studying long texts, and, as such, the trends are perhaps more suggestive. The overwhelming majority of engagement acts observed were voluntary student responses to a teacher's questions, with 68 percent of the observed engagement acts from six class periods falling into this category. Only approximately 9 percent of all engagement acts that were observed were acts of low engagement and only 5 percent of all engagement acts were off task activities. All of the classes observed with high ability level students discussing or reading short texts showed that students were engaged with what they were doing.

There were three classes observed with low ability students studying long texts. The engagement acts observed were relatively evenly split between high and low engagement, with approximately 54.5 percent of all observed engagement acts reflecting high engagement and 45.5 percent of all observed acts reflecting low engagement. The most commonly observed high engagement act was students responding voluntarily to a question that the teacher asked which represented 43 percent of all engagement acts observed. The most commonly observed act of low engagement for low ability level students and long texts was off task activities, which accounted for 38 percent of all engagement acts observed. All of these three classes showed that the students were overall disengaged with the literature they were studying.

The final data set that was analyzed was for low ability level students studying short texts. The engagement acts that were observed in these classes showed that students were, overall, highly engaged with the text they were discussing. 71 percent of all engagement acts observed were students responding voluntarily to the teacher's question. The low engagement acts that were observed showed that 15 percent of all observed engagement acts reflected off task behaviors.

Conclusions

The data suggest that there are some clear trends that exist between the length of the text being studied and student engagement. There appear to be trends that exist between student ability level, text length, and student engagement as well. Both ability levels of students showed a higher percentage of high engagement acts with short texts than with long texts. High ability students showed a higher percentage of high engagement acts overall than low ability students. Low ability level students were much more engaged with short texts than long texts, which supports the guiding hypothesis. However, high ability level students were also more engaged with short texts than long texts; this does not support the guiding hypothesis. All of the classrooms that were observed were dominated by two engagement acts: students responding voluntarily to a teacher's question and students engaging in off task activities.

Implications

This study was limited due to the large percentage of class time that was spent on topics other than fictive texts. Future studies may seek to answer why such a large amount of class time was spent repeatedly going over project requirements and vocabulary review. This study's methodology also contributed to its limitations; relying solely on observations and field notes to collect data did not take into account the multilayered aspects of classrooms. Future studies might alleviate this concern by employing different methods that include surveys and interviews of both teachers and students in order to account for limited observations of literature being taught and discussed.

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Oral Proficiency Development in the Secondary Spanish Classroom

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In today's global society there is an ever increasing demand for multilingual speakers who are well-prepared for the challenges of the 21st Century workforce at home and abroad as well as critical needs related to national security (US Department of State, 2006). The heightened awareness of the importance of foreign language study in the United States has focused more attention in recent years on proficiency-oriented, or performance-based, instruction in grades K-12. In order to help structure proficiency-oriented programs, the American Council on the Teaching of Foreign Languages (ACTFL) developed the *Standards for Foreign Language Learning in the 21st Century* (ACTFL, 1996) and the *Performance Guidelines for K-12 Learners* (ACTFL, 1998). The *Performance Guidelines* include three modes of communication: interpersonal, presentational and interpretive. These national expectations provide a framework for the implementation of a long sequence of uninterrupted study in grades K-12 with performance-based outcomes (Curtain & Dahlberg, 2004). In the area of oral language development, performance-based strategies are essential to students' success in their program of study. Strategies aimed at meaningful communication over a long period of time can ensure that students are able to engage in use of the foreign language for a variety of purposes (ACTFL, 1996; ACTFL, 1998; Rifkin, 2003).

Review of Literature

In general, much of the proficiency-oriented approach is supported by the work of Vygotsky (1978), and later, Krashen and Terrell (2000). Vygotsky researched first language learning and acquisition and emphasized the teacher's role as an aid to the student's natural language development. Krashen and Terrell also promote a natural learning method with the Natural Approach which allows students to acquire a second/foreign language the same way in which they acquired their first language.

Krashen's Input Hypothesis, the theoretical basis for much of the Natural Approach, explains that the majority of language is acquired through a subconscious process and that students move through stages of language production. This acquisition process can only occur when the affective filter, the level of anxiety the student experiences when engaged in language learning, is at an appropriate level. The teacher can manage the affective filter by using language at a slightly higher level (input +1) than the student's current level, ensuring that the student is challenged without being overwhelmed. Vygotsky, Krashen and Terrell provide a basis for later performance-based instruction techniques by modeling second/foreign language acquisition processes after first language acquisition (Krashen & Terrell, 2000; Vygotsky, 1978).

The Natural Approach supports the development of proficiency by taking into account the stages one moves through, beginning with a period of listening comprehension followed by simple utterances and leading to full discourse. This understanding of second language acquisition research has played a significant role in furthering the proficiency-oriented approach in K-12 foreign language programs (Glisan, 1988; Liskin-Gasparro, 1984; Rifkin, 2003). In the recent education reform movement, the *Standards* (ACTFL, 1996) and the *Performance Guidelines* (ACTFL, 1998) have provided a framework for performance-based instruction which offers an opportunity for students to gain communication ability in a foreign language. Over time, instruction that is purposefully designed to develop proficiency can move students from learning language in the skills-getting stage to using it for communicative tasks (Glisan, 1988). Performance-based instruction is task-oriented and provides a language rich environment in which students use the foreign language in authentic and meaningful ways. Authentic language tasks are those that communicate real information by situating language in simulations of real-life situations (Donato & MacCormick 1994).

In proficiency-oriented instruction new material is presented within a larger theme and with a communicative purpose, thus providing a meaningful context (Glisan, 1988). Vocabulary and grammar concepts should be made relevant to students so that they can make connections between learning a foreign language in the classroom and using it to communicate in the world outside the classroom (Glisan, 1988). Krashen's Input Hypothesis (Krashen & Terrell, 2000) points out that students can intrinsically acquire

grammar rules, however, such a mechanism can only be utilized when the input is meaningful and aimed toward communication. Material should be presented in many different ways and in small increments to provide students with adequate practice. By narrowing the amount of new material taught at once, more time can be dedicated to practice within a communicative context (Glisan, 1988).

Proficiency-oriented assessment practices should complement instructional strategies and align with the *Standards* (ACTFL, 1996) and the *Performance Guidelines* (ACTFL, 1998). In documenting student progress, there should be multiple opportunities for students to perform task-based activities for a variety of communicative purposes. Classroom assessment practices can be either formal or informal in nature (Curtain & Dahlberg, 2004). Formal assessment practices have specific criteria for different aspects of proficiency development being assessed and can include oral presentations, interviews, and projects and are generally summative if administered at benchmark points in time. Informal assessment techniques are done on a daily basis and include activities such as daily performance, oral responses, and pair/group work and are generally formative if they are incorporated throughout a period of time as a way to continually gauge students' language development. Both types of assessment practices are needed to ensure development of proficiency and to move students from one level to the next. In addition to the use of formal and informal practices in classroom instruction, there are also field-tested instruments that assess oral proficiency of K-12 students. The *Integrated Performance Assessment* (ACTFL, 2006), the *Simulated Oral Proficiency Interview* (Center for Applied Linguistics, 2007), and the *Computerized Oral Proficiency Interview* (Center for Applied Linguistics, 2007) are among the most current. By creating assessment practices that chart proficiency development, foreign language programs can be better prepared to help students gain advanced communication ability in the foreign language (Rifkin, 2003).

One area of assessment that influences oral language development is the use of error correction. It is important that foreign language teachers be conscious of appropriate strategies for they can affect student motivation in generating language. For example, direct error correction can heighten anxiety and increase negative feelings toward the foreign language. Therefore, teachers should choose error correction carefully and help

students improve their accuracy as they increase their ability to communicate (VanPatten, 1982). Additionally, by promoting the use of the foreign language in peer interactions, students see the foreign language as a communicative resource (VanPatten, 1986). By using instructional strategies that engage students in meaningful learning experiences, teachers can motivate their students to achieve higher levels of proficiency (Rifkin, 2003). The purpose of this study was to investigate strategies Spanish teachers at the high school level use to promote students' oral language development.

Methodology

The study involved eight high school Spanish teachers in a public school district in North Carolina and took place between September and December, 2008. The subjects were selected according to their master teacher status or through recommendation of the researcher's advisor. The study was conducted in two parts. First, the researcher interviewed the subjects using a researcher designed interview instrument. Second, the researcher selected five teachers and observed a class period of each teacher to ascertain how oral proficiency strategies were incorporated into instruction. The researcher used the information collected during the interviews and observations to determine how instructional strategies were utilized to develop oral proficiency.

Results and Conclusions

The following discussion of interview and observation results deals with the information gathered by the researcher. The majority of the teachers interviewed are familiar with the *Performance Guidelines* (ACTFL, 1998) and use them to plan instruction and assessment. The researcher saw evidence of use of the *Guidelines* through both the observed and reported oral proficiency techniques which integrate the three modes of communication into instruction. For example, teachers reported using group work to practice the interpersonal mode, oral presentations to practice the presentational mode, and listening comprehension activities to practice the interpretive mode. Furthermore, teachers reported using authentic communication techniques and resources. For instance, some teachers mentioned using Information-Gap Activities and integrating resources from the target culture into their classroom as a way to engage students. The teachers' use of performance-based instructional strategies shows that the district as a

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whole is working towards creating a program which provides students with the opportunity to become highly proficient in a foreign language.

However, although most teachers interviewed uniformly reported using proficiency-oriented techniques, the teachers' reported expectations for their students' oral proficiency development varied. Teacher expectations influence techniques used to develop oral proficiency, specifically in the use of the foreign language by both students and the teacher. There is large variation in the approximate amount of time teachers reported that they spend instructing in Spanish or developing oral proficiency, as well as the frequency with which students speak Spanish in class. The approximate reported time spent instructing in Spanish ranged from 25-100% of the class period, as did the approximate reported time spent developing oral proficiency. The frequency with which students speak Spanish in class ranged from *frequently* to *always*. The variation in the results regarding student oral proficiency expectations indicates that teachers have different expectations for their students, which may indicate that the district may not have clearly defined oral proficiency expectations for students. However, the researcher is aware that the district is creating pacing guides and working towards developing clearer expectations for students.

Teachers reported and were observed to incorporate numerous formal and informal proficiency-oriented assessment practices into the classroom. For example, teachers used class participation and group activities as informal assessments practices and oral presentations or dialogues for formal assessment practices. Teachers reported using more informal than formal assessment techniques. The more frequent use of informal assessment practices was attributed by many of the teachers interviewed to the fact that many foreign language teachers are often unsure of how to explain the criteria for a formal assessment to the students. It is important for teachers to incorporate both formal and informal assessment practices into the class in order for students and teacher to have a complete understanding of students' language development.

In conclusion, this brief study shows that the district is making strides toward preparing students to attain proficiency so as to be able to communicate in a foreign language. There is evidence that many teachers are aware of the *Guidelines* (ACTFL, 1996) and are using this resource to incorporate performance-based techniques into

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instruction by integrating the three modes of communication as well as authentic communication techniques and resources. There was some variation in teacher expectations for student oral proficiency development, which was reflected through differences in the amount teachers reported instructing, and having their students speak, in the foreign language. Nonetheless, the researcher is aware that the district is moving toward developing clearer expectations for students by creating pacing guides which make language expectations explicit for each level of the program. Teachers reported integrating both formal and informal assessment practices into the classroom but tended to use informal assessment techniques more often due to uncertainty regarding how to explain assessment criteria to the students. More extensive observation and research would be needed to understand more comprehensively the strategies that Spanish teachers at the high school level use to promote students' oral language development.

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Teaching Elections through Technology: A Study of Two High School Civics and Economics Classrooms

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The importance of incorporating technology into social studies classrooms is recognized as a way "to support learner-centered strategies that address the diverse needs of students" and "apply technology to develop students' higher order skills and creativity" (North Carolina Council for the Social Studies, 2006, p. 5). Research that examines the extent to which teachers utilize technology in classrooms is limited (i.e., Saye & Brush, 2007). This research recognizes the role of technology, especially for the current generation of students as transformative pedagogy. The social studies curriculum presents many opportunities for incorporating technology into the classroom. One of the main concepts in the North Carolina Civics and Economics tenth grade social studies curriculum is the election process (North Carolina Standard Course of Study, 2007). The role of technology in the election process is considerable. Technology makes information about candidates accessible in new ways. The use of technology to teach about the election process can engage students and also may motivate them to stay informed about elections such as the 2008 presidential race.

Technology and the Social Studies

Technology integration is particularly relevant to social studies content. Technology skills are essential in the global market; thus social studies teachers have the responsibility to prepare students to actively participate in this global society. Policy makers are beginning to reflect the necessity to prepare students for the global market as evident by National Technology Standards (NETS) for both teachers and students that were issued by the International Society for Technology in Education. As newer technologies emerge, teachers must think about how they can use technologies to reflect the global world. The multitude of technology resources available challenges teachers to not only have current technology skills but also be able to connect the current

technologies to the social studies classroom (Wilson, Wright, & Periano, 2007). There is great potential for teachers to create innovative activities which use technology to enhance student knowledge. Although the role of technology in social studies education is emphasized, research shows that technology is not utilized to produce maximum efficiency. There is a need, however, for research to demonstrate effective strategies for incorporating technology into the social studies curriculum (NCSS, 2006).

Citizenship and the Election Process

Technology has changed and will continue to change elections. Evidence of this change is through the use of the Internet. The Internet gives citizens access to an overabundance of information and perspectives about candidates, platform issues and poll results (Friedman, 2006). The 2008 presidential election shows the impact of technology as one of the debates (for the first time) consisted of constituent questions communicated through *YouTube*. The challenge teachers now face is how to "link the lesson plans and student activities on the election to local, state, and national standards" (Risinger, 2006, p.370). This study examines how two high school social studies teachers incorporated technology into their classroom to teach about elections. Specifically, this research addressed the following questions:

1. What is known about Civics and Economics teachers' beliefs, attitudes and prior experience with regard to the use of technology to teach about elections?
2. How do Civics and Economics teachers integrate technology into their instruction about elections?

Methodology

In this study, a qualitative approach (Gay, Mills & Airasian, 2006) was used to determine how teachers were using technology to teach about elections. Multiple sources of data were collected to ensure the trustworthiness of the study. To obtain participants for this study the researcher practiced "purposive sampling" and emailed two teachers specifically asking for participation in the study (Gay et. al, 2006, p. 134). One teacher, Mrs. White, had been teaching for twenty-seven years and taught five classes of Civic and Economics. The other teacher, Mr. Jones, had been teaching for twenty-one years and taught five classes of Civics and Economics. Pseudonyms have been provided for

each participant to ensure confidentiality. The study took place in one high school in the southeastern region of the U.S. during one fall semester.

Survey Instruments

Data collected for this study included a survey, semi-structured interviews and in-class observations.

The first task involved a survey issued to both Civics and Economics teachers via email and solicited information about curriculum objectives. The survey was divided into two sections including curriculum objectives (participants used a Likert scale format to note the frequency with which they felt certain topics including political parties, election process, presidential campaign, media sources, political parties and Electoral College should be included in the curriculum) and technology use (what technology resources do you use in your classroom? how often do you use technology in teaching? Identify all the resources you use to teach about the election process).

The second task focused on nonparticipant observation of classrooms. Field notes were taken to describe the instruction of election process and teaching methods through technology use. The researcher used Spradley's description matrix as guidelines for observations (1980). Field notes were gathered, recorded and compiled on-site

. The third task involved interviews with both teachers. The first interview was based on Patton's (2002) "standardized open-ended interview approach" (p. 284). The interview questions asked participants to describe their experiences with classroom technology in the past and how they incorporated technology to teach about the election process. The second type of interview was based on Patton's (2002) "informal conversation approach" (p. 283). Questions were asked based on the context of each participant's classroom.

A qualitative design guided the data collection and analysis of this study. The researcher served as the primary instrument for gathering and analyzing data. Field notes taken from observations and interviews were analyzed using Strauss and Corbin's (1998) "grounded theory" approach (p.12). Open coding was used to identify, name and categorize themes from the data. Ongoing analysis throughout the study allowed the researcher to clarify issues and make necessary adjustments.

Results

Teachers' Attitudes and Prior Experience of Technology Integration with Elections

Analysis of data indicated commonalities among participants past use of technology. The data has been divided into three main themes. First, both participants expressed a positive outlook about previous use of technology integration. Second, both teachers used technology as a teacher resource for collecting information about elections in the past. Finally, the data showed that both teachers incorporated technology, more specifically the Internet, through an end of unit project.

Technology Integration in 2008 Social Studies Classroom with Elections

Two major instructional methods emerged from the analysis of data on technology integration with the 2008 elections: special projects and obtaining supplemental resources.

Special Projects Both teachers used technology, via the Internet, with special projects. Special projects refers to assignments that used technologies and were considered "out of the norm" for everyday instruction. In most cases the projects took place in the computer lab. Projects were worth a significant part of the grade and students were given several weeks to complete them. Both teachers assigned students specific requirements that allowed them to use the Internet to answer questions about a topic related to elections. The projects were all designed around content from the North Carolina Standard Course of Study. Both teachers refereed to these projects as evidence of their use of technology. The availability of the Internet enabled students to conduct a student centered activity and it also allowed the teacher to monitor student learning easily. The technology via the Internet acted as the teacher as it gave students information about candidates.

Supplemental Resources The data also showed that both teachers used the Internet to obtain supplemental resources for classroom activities. Sample 2008 Presidential election ballots from the Internet were used by both teachers. Mrs. White used the Internet regularly to obtain supplemental resources for class. She obtained documents such as online campaign advertisements which she used to explain political parties, North Carolina Standard Course of Study vocabulary words and political party systems. Both

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teachers referred to the Internet as an efficient method by which to obtain information needed to supplement classroom instruction. It was clear that Mrs. White used the Internet more frequently for in-class supplemental resources in comparison to Mr. Jones.

Limitations of Technology Use

The results of this study suggest that the use of technology to teach about elections was limited. Both teachers used technology in order to obtain supplemental resources or for student centered research projects. These projects were usually at the end of the election unit and involved technology instruction that was out of the norm for both teachers. The use of technology was considered a separate event in which an entire class focused on using the technology to obtain a goal. As a result, technology was considered time consuming and thus a reason why both teachers stated that their technology use was limited. The teachers expressed that they felt pressure to adhere to the demands of the North Carolina Standard Course of Study, as their instructional time had decreased from years past.

It should be noted that this study was designed as a qualitative case study. Both teachers were from the same school and were in the same department. As a result, data results could be limited to the demographic characteristics of the faculty and student population. Further research on this topic with a larger data set would be recommended to obtain results applicable to a larger population.

My own teaching practice is informed by this research. Technology is under-utilized in many public school classrooms, as the study reveals. For an overworked teacher with little time that is devoted exclusively to lesson planning (instead of to administrative or class management issues), the first impulse is to rely on the more traditional resources and methods with which one was taught. That is what appears to be the case with the teacher participants in the present research. In my own case, awareness of possibilities and a renewed enthusiasm for the benefits of investing time and energy into technology will provide impetus for its integration into instructional practices

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Higher Order Thinking in Social Studies: Two Teachers' Approaches

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One area of pedagogy that is gaining more research attention is how teachers incorporate the instruction of higher order thinking into their curriculum (Bereiter & Scardamalia, 1987; Burden & Williams, 1998; Collins, & Mangieri, 1992, Zohar, 2004). Teachers are being encouraged to help their students become active participants in the construction of their knowledge by challenging students to "interpret, analyze, and manipulate" the information that is given to them, rather than strictly memorize a set of facts (Newmann & National Center on Effective Secondary Schools, 1987, p. 2). In particular, the field of social studies provides multiple curricular opportunities for teachers to incorporate higher order thinking into their instruction.

Literature Review

Defining higher order thinking is a difficult task for many educators and researchers. Teachers may often have a vague idea of what the term encompasses and why it might be important in the educational realm, yet many still can't provide a clear explanation of higher order thinking (Paul, Elder, & Bartell, 1997). The task of determining what actually constitutes thinking on a higher level can be problematic. It is difficult to decide at what point lower order thinking transitions into critical thinking or reasoning. Newmann (1987) attempts to summarize higher order thinking as, "interpreting, analyzing, manipulating information to go beyond the information given" (p. 6).

Higher order thinking is an invaluable skill that teachers may incorporate into their teaching for a variety of reasons. Teaching higher order thinking, "equips students with the tools to examine the human experience, to make sense of competing perspectives, to evaluate arguments based on available evidence, and to reach informed decisions" (Foster & Padgett, 1999, p. 358). The implications of teaching these skills go

far beyond the classroom and into the daily life of the students (Stratton, 1992). These thinking skills will impact the students as they progress from high school teenagers to adults in the complex world. Although lower-order thinking skills may be momentarily beneficial, information that is not connected to the students' previous knowledge or experience can be quickly forgotten (Foster & Padgett, 1999).

Purpose of the Study

This study will attempt to evaluate how two United States History teachers differ in their incorporation of higher order thinking into their instruction while teaching one unit topic. The study will examine the differences in the teachers' underlying beliefs about higher order thinking and how these beliefs affect their implementation. This study will begin to identify barriers to the use of higher order thinking that inhibit these teachers from integrating it into the curriculum. It is hoped that this study will provide in depth insight into a skill that is becoming increasingly important for students to master in our schools and society. As we move into the 21st century, critical thinking, creativity, and problem solving skills will be essential assets that our youth must possess in order to retain our place among the global leaders. This study analyzes the manner in which two teachers (Mr. Smith and Mr. Johnson, both pseudonyms) are pursuing this significant issue of higher order thinking.

Method

Participants

Participants for this study are two United States History teachers in Winston Salem/Forsyth County school system. One teacher has been teaching for a total thirteen years at one public school in Winston Salem, with ten of those years teaching U.S. History. The other teacher is in his first year of teaching.

Instrument/Procedure

Data collection involved a combination of interviews and observations. The participants were both interviewed using a pre-determined set of open ended questions about higher order learning. This method allowed the researcher to be able to "explore, probe, and ask questions that will elucidate and illuminate that particular subject" (Patton, 1990, p. 283). After these preliminary interviews were conducted, each teacher was observed during every instructional lesson of the same unit during the same class period.

To enable comparison between the teachers, both were observed during one Honors United States' history class. These observations were conducted in the classroom in order to study the teachers in a naturalistic setting.

After observing the teachers for an entire unit, the researcher conducted post-observation interviews. These interviews were open ended questions about how the teacher thought the unit had gone and the extent to which they incorporated higher order thinking into their instruction.

Results

Mr. Smith

Mr. Smith, who is in his first year of teaching, demonstrated his belief in the importance of engaging students in higher order thinking throughout the entire research study. When asked if he specifically thinks about engaging his students in higher order thinking while developing a lesson, he responded: "I definitely try and make sure that's the case." He describes higher order thinking as, "Questions that are higher on Bloom's taxonomy. So, not the questions that you can answer in one word, such as 'what is this?' But questions that you have to ask, 'How?" How does this affect another thing? What is the impact of this?" In order to engage his students in this type of thinking, Mr. Smith usually relies on his homework and in class assignments. These assessments usually vary among reading and answering questions, defining and determining long term effects of vocabulary words, putting terms in chronological order, political cartoon analyses, journal entries, or graphic organizers. These assignments are usually scaffolded in order to include both lower and higher order questions.

Another defining characteristic of Mr. Smith's view on higher order thinking is his belief about how many students are capable of higher order thinking:

> *I think the vast majority of students, no matter what level they are on in*
> *their classes, can think on a higher order level. You just got to have*
> *patience with them. You've got to scaffold really well. You've got to break*
> *it down step by step as they analyze information…As you do it over time,*
> *any student can learn to think at a higher level. Not every kid is going to*
> *reach that same level, but every kid can do it to a certain point.*

Believing that almost every student can engage in higher order thinking seems to be the foundation of his teaching philosophy. By incorporating discussion, lecture, group work,

graphic organizers and other assessments on a regular basis, Mr. Smith explains that he's, "always trying to reach every kid because they learn a little differently."

Mr. Johnson

In many ways, Mr. Johnson, who has been teaching for 13 years, approaches higher order thinking in a very different manner than Mr. Smith. Without much deliberation, Mr. Johnson succinctly defined higher order thinking as, "The application of information to either solve a problem or to create a good question…Rather than just recalling it, actually using it for something."

Whereas Mr. Smith relies on student-centered activities during class, Mr. Johnson tends to use more lecture to communicate new information to students. After thirteen years of experience, however, his lecture does not come from standing at a podium at the front of class. In fact, the information is so engrained that Mr. Johnson did not glance at any notes when giving the students new information during the entire unit. He structures his lectures in the shape of telling a story, often changing his tone of voice to emphasize his points. He also relies heavily upon body language to describe different events.

In order to ensure that the students are following his lecture, Mr. Johnson hands out a sheet of key terms to his students at the beginning of class. Although the notes help the students to follow his instruction, they do not serve as a method of engaging students in higher order thinking. In order to do this, Mr. Johnson says, "I try to ask a lot of questions throughout the course of the class period and some of them I think, or hope, require higher order thinking." The questions he asks vary between higher and lower order, depending on where he ultimately wants to lead his students in their thought processes.

Although Mr. Johnson attempts to incorporate higher order thinking into his instruction, he differs from Mr. Smith in the belief that all students are necessarily capable of reaching that level. As Mr. Johnson puts it, "Like I said before, higher order thinking is using the information you've got. And there are some kids in the standard class who can't grasp the facts that are required to use it. Do you know what I mean? The battle is getting them to know the basics."

End Of Course Tests

Mr. Smith and Mr. Johnson can be placed on opposite ends of the spectrum with regards to years of experience and method of instruction, yet similarities begin to be seen when evaluating the influence of North Carolina's End of Course Tests, or "EOCs". However, both teachers expressed that testing can become an impediment when teachers are trying to move beyond basic recall of information and engage their students in higher academic pursuits. Mr. Johnson describes the long term results of this approach to testing by saying:

> *The thing is, most of the kids in my honors class last year who got a level 4, which is the highest level on the EOC, if you ask them five years from now about US History, I think it's going to be a pretty small percentage who actually remember anything. But the ability to think critically and read well, that's something that once you can do it, I don't think you completely lose it. You lose facts. Skills are harder to lose. And I don't think we are teaching skills in social studies- I think we're teaching facts.*

Mr. Johnson's comments help to show that if a teacher focuses on facts, especially in a social studies classroom, critical thinking skills, problem solving skills, and other higher order thinking abilities might never be ascertained.

Implications

Mr. Smith and Mr. Johnson offer two contrasting examples of how high school social studies teachers attempt to teach higher order thinking skills. As the literature suggests, Mr. Smith appears to take a more "constructivist" approach, whereas Mr. Johnson leans towards a more "transmission of knowledge" approach (Zohar, 2004, p. 293). The question remains, whether one method is more effective in engaging students in higher order thinking. In a student-centered methodology like Mr. Smith's, research has shown that information is processed on a much deeper level when students are active participants in their learning (Foster & Padgett, 1999). However, if this methodology is employed in the wrong manner, students are responsible for their own depth if the teacher does not serve as an adequate facilitator. An emphasis must be put on advancing each student's thinking individually as well as providing assessments that are challenging and scaffolded.

A teacher-centered approach, such as Mr. Johnson's, also has its benefits and limitations to higher order thinking. When a lecture is given in the storybook style of Mr.

Johnson's, the content can become real and alive to the audience. For many students, higher order thinking will come naturally when they are engrossed in the content they are learning. The difficulty in this lecturing style, however, is that oftentimes students are not necessarily innately interested in much of the content that they need to learn. In order for students to engage in higher order thinking using this approach, the teacher must make an extra effort to assess whether all students are understanding the material and attempting to connect it to previous knowledge. Although all of the students are receiving the content knowledge through lecture, the teacher must ensure that they are also taking the next step to think on a higher level.

Regardless of teaching methodology, this study demonstrates that standardized testing plays an important role in high school social studies. If tests continue to emphasize students' ability to recall an extensive amount of information, higher order thinking skills will inevitably be sacrificed. Ultimately, we need to determine whether or not we want the end of course tests to assess a student's ability to recall facts or their ability to think critically and use problem solving skills. If tests begin to assess higher order thinking skills, teachers may look beyond rote facts and memorization and move to challenge their students in a deeper way.

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The Effect of Instructional Methods on Student Motivation in Chemistry Education

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What motivates high school students to process concepts in science education at deep cognitive levels? Barker and Dowson (1999) note that the quality and quantity of information processing is directly related to the type and depth of cognitive operations that are employed at the time of learning. To process knowledge at deeper cognitive levels, students must be able to integrate new information with previous knowledge and preconceptions (Posner, Strike, Hewson and Gertzog, 1982). More specifically, Posner et al. (1982) note that this process allows a student to reorganize his or her preexisting knowledge in order to grasp a new concept successfully.

The present research focuses on one of many factors that affect a student's depth of information processing: student motivation. Various factors are postulated to affect student motivation, including student beliefs about learning science (Hanrahan, 1998), the value and relevance of science content being learned (Tuan, 2005), and the intrinsic value placed on learning in general (Bruinsma, 2004). Student motivation is especially of interest in the field of chemistry education, due to its perceived difficulty by high-school students (Lawrenz, 1975). Therefore, proponents of chemistry education raise the concern for motivating all students to succeed in learning chemistry concepts.

Existing research suggests that some instructional techniques appear to be more effective than others at promoting greater academic motivation among students and an increased understanding of science knowledge (DiEnno and Hilton, 2005; Tai and Sadler, 2007; Blumenfeld and Meece, 1988). Additionally, teacher attitudes may be an important factor in increasing students' intrinsic motivation to learn (Nicol and MacFarlane-Dick, 2006; Atkinson, 2000). These studies bring about a variety of questions that probe further into the topic of interest: Do specific instructional methods increase student motivation to learn chemistry, in particular? How do teacher attitudes affect a student's

desire to learn chemistry or the emphasis that students place on the value of chemistry education?

The present study aims to uncover instructional practices that correlate with an increased motivation to learn chemistry among high school students, and just as importantly, practices that correlate with decreased student motivation. It is hoped that the results of this study will provide educators with a better understanding of instructional techniques that engage students in chemistry class, in order to promote deeper levels of information processing and thus help students understand and retain the information that they are learning in the classroom.

Methodology

The present study is a quantitative study which uses a Likert-scale questionnaire to assess student motivation and teachers' instructional techniques. Student motivation was hypothesized to be greater in classrooms where constructivist learning methods (such as hands-on or student-centered activities) and positive teacher attitudes are present.

The study population consisted of high-school students enrolled in chemistry courses in Winston-Salem/Forsyth County Schools (WSFCS) in North Carolina. Both honors and standard-level chemistry courses were included in the study to increase sample size and thus increase the statistical power of the quantitative results.

Data was collected via a three-page questionnaire that assessed student attitudes towards chemistry, as well as their teachers' instructional methods and perceived attitudes. Section One employed questions from a survey by Tuan et al. (2005) to assess student motivation in science via a Likert Scale. The three motivational factors that were addressed include self-efficacy, active learning strategies and science learning value (Part A, B and C, respectively). Section Two used a Likert Scale to assess the frequency by which classroom teachers employ various instructional techniques in their classrooms. Section Three used a Likert Scale to assess teacher attitudes as perceived by the students.

The mean values for student self-efficacy, active learning strategies, science learning value and total motivation were determined for each classroom, and compared via a one-way ANOVA analysis using SPSS 16.0 software. In addition, mean student

motivation scores for each classroom were compared to the mean value for teacher attitude and mean values for each instructional method via a bivariate correlation analysis. Construct validity was achieved via the assumption that any significant differences found through statistical analyses are reliable at a 95-percent confidence interval ($\alpha = 0.05$). Lastly, selected instructional techniques were grouped by pedagogy (constructivist versus traditional instruction) and compared across classrooms to determine if any trends exist between instructional pedagogy and student motivation.

Results

Seven teachers agreed to have their chemistry classes (four honors and three standard-level courses) participate in the research questionnaire. Survey results were compiled for 123 high-school students (78 male, 45 female). Mean student motivation scores for each classroom are shown in Table 1. One-way ANOVA analysis revealed that there were significant differences between classrooms for students' use of active learning strategies ($p = 0.024$) as well as total student motivation scores ($p = 0.035$, $\alpha = 0.05$). Teacher attitude scores, as perceived by the students, were also quantified for each chemistry teacher. Mean perceived attitude scores for each teacher are presented in Table 2. A one-way ANOVA analysis revealed a significant difference in perceived teacher attitudes for the classrooms under study (Table 3, $p < 0.001$, $\alpha = 0.05$).

Table 1

Mean student motivation scores for all participating chemistry teachers.

	Self-Efficacy	Active Learning Strategies	Science Learning Value	Total Motivation
Teacher A	27.6 ± 4.2	28.0 ± 4.1	17.1 ± 4.7	72.6 ± 10.3
Teacher B	30.0 ± 3.5	29.3 ± 3.0	18.8 ± 4.1	78.1 ± 9.8
Teacher C	26.0 ± 5.0	26.6 ± 3.9	16.7 ± 3.9	69.3 ± 11.5
Teacher D	28.9 ± 3.4	28.2 ± 3.0	17.7 ± 3.4	74.8 ± 7.2
Teacher E	28.9 ± 4.7	28.7 ± 3.6	18.5 ± 2.6	76.1 ± 9.2
Teacher F	26.9 ± 7.6	27.8 ± 3.8	17.4 ± 4.1	73.2 ± 10.7
Teacher G	29.0 ± 4.0	29.9 ± 3.0	18.9 ± 3.01	77.7 ± 8.0

The instructional methods of each teacher were examined further via a bivariate correlation analysis, in which the mean score for each instructional strategy was correlated with the mean student motivation scores, for each classroom. Results of the analysis indicate that there is no significant relationship between any instructional technique and any aspect of student motivation ($\alpha = 0.05$). However, it appears that a strong, negative correlation may exist between frequency of class lecture and the extent to which students find value in chemistry education ($p = 0.052$, $r = -.751$). In addition, perceived teacher attitudes appear to correlate significantly with students' use of active learning strategies ($p = 0.039$, $r = 0.779$).

To obtain a well-rounded picture of how instructional methods influence student motivation, specific instructional activities were grouped according to traditional versus constructivist teaching methods, to determine if any of the participating teachers utilized these pedagogies substantially more than others. Results of this analysis indicate that teachers' use of constructivist teaching methods appears to correlate positively with student use of active learning strategies.

Table 2

Mean perceived attitude score for each participating chemistry teacher.

	Teacher Attitude
Teacher A	19.8 ± 3.4
Teacher B	19.6 ± 4.6
Teacher C	20.1 ± 3.4
Teacher D	20.9 ± 2.5
Teacher E	19.5 ± 2.9
Teacher F	15.4 ± 4.3
Teacher G	23.2 ± 1.6

Table 3

P-values resulting from bivariate correlation analysis between student motivation scores and instructional methods, including perceived teacher attitude (α = 0.05). Starred values indicate a significant correlation.

Instructional Method	Self-Efficacy	Active Learning Strategies	Science Learning Value	Total Motivation
Lecture	0.362	0.152	0.052**	0.169
Class Discussion	0.974	0.322	0.564	0.554
Science Demonstration	0.200	0.128	0.141	0.096
Graded Homework	0.762	0.501	0.447	0.546
Projects	0.877	0.382	0.397	0.609
Science Experiments	0.468	0.205	0.275	0.272
Small Group Work	0.460	0.332	0.313	0.336
Written Tests	0.670	0.967	0.687	0.933
Play a Video	0.514	0.301	0.570	0.369
Read Scientific Articles	0.274	0.641	0.477	0.381
Memorize Facts	0.984	0.518	0.452	0.682
In-Class Worksheets	0.627	0.588	0.201	0.561
Ungraded Homework	0.583	0.765	0.894	0.638
Ungraded Quiz	0.310	0.618	0.721	0.465
Graded Quiz	0.939	0.822	0.835	0.982
Teacher Attitude	0.341	0.039**	0.106	0.088

Conclusions and implications

Overall, the results of the present study indicate that constructivist learning methods promote a greater use of mastery, or *active* learning strategies among students enrolled in high-school chemistry courses. The use of constructivist teaching strategies promotes information processing at deeper cognitive levels (Posner et al.,1982), and was shown to increase student motivation to learn chemistry. Additionally, students who perceived their teacher as frequently using traditional methods of instruction reported a lower motivation to learn chemistry. Lastly, teachers who demonstrate a positive, encouraging attitude towards students and chemistry education tend to promote a greater use of active learning strategies among students, and ultimately higher levels of student motivation. Though further studies are needed to strengthen and clarify the

aforementioned trends in student motivation, the present study offers some initial

guidance for chemistry instructors who aim to promote an engaging classroom

environment in which students are encouraged to process information at deeper cognitive

levels.

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The Relationship between Teacher Time-Management and Student Engagement

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How do a teacher's time-management skills affect student performance? This study seeks to answer this question. Some teachers may be very time-conscious while others are what we would call "time-eternal." Both teachers may be very knowledgeable and good teachers, but does one of these styles create more student engagement in the classroom?

Review of Literature

Macan, Shahani, Dipboye, and Phillips (1990) conducted a study concerning time-management skills and the effects they have on student performance. The study was a self-report questionnaire answered by college students. The questionnaire addressed how they felt about their time-management behaviors, for example: whether or not they practiced those skills and if they felt positively or negatively about their school performance (Macan et al., 1990, p. 761). The researchers also had quantitative data from the students' grade point averages. The researchers hypothesized from the literature they gathered that time-management would have a positive effect on students' levels of role ambiguity, somatic tension, job overload, sense of satisfaction, and performance (Macan et al., 1990, p. 761). The results of the study confirmed that good time-management had a positive effect on all these things. The researchers broke down each of their four factors of time-management (Perceived Control of Time; Setting Goals and Priorities; Mechanics—Planning, Scheduling; and Preference for Disorganization) and their individual relationships to student attitudes and performance (Macan et al., 1990, p. 765). Each supported the hypothesis. They also found that older subjects, females, morning persons and those with "Type A" personalities were all more likely to report engaging in time-management behaviors (Macan et al., 1990, p. 765). Overall, perceived control of time was "the strongest of the correlates;" the findings were "consistent with stress

research showing that feeling in control of the situation is related to lower levels of stress" (Macan et al., 1990, p. 767).

Nystrand and Gamoran have done a lot of research to learn how to improve student engagement in the secondary English classroom. Though they have been observing teacher pedagogy rather than teacher time-management, their definitions of engagement should be considered invaluable to any subsequent studies on the subject. They define engagement as "a cognitive phenomenon essentially having to do with the extent to which students are mentally involved with the issues and problems of academic study. Hence, it may be considered in terms of sustained mental concentration, focus, and habits of thoughtfulness" (Nystrand & Gamoran, 1990, p. 22). Student engagement increases a teacher's job satisfaction and also means students are "more likely to learn the knowledge and skills that schools have to offer" (Nystrand & Gamoran, 1989, p. 1).

Nystrand and Gamoran (1989) suggest that there are two different forms of student engagement: procedural and substantive (p. 1). They argue that few students are "actively off task… Rather, most students are at least engaged in the procedures of their school tasks" (Nystrand & Gamoran, 1989, p. 2). Procedural engagement takes the form of students mainly paying attention, not distracting others, doing their work, sometimes asking questions, and doing their homework (Nystrand & Gamoran, 1989, p. 2). However, Nystrand and Gamoran (1989) argue that without "sustained, substantive engagement," "significant achievement is not possible" (p. 2). Procedurally engaged students are easy to identify just by watching. Substantively engaged students are not because they do not all look the same (Nystrand & Gamoran, 1990).

Methodology

The subjects of this study were four master English teachers and their students in a Winston-Salem / Forsyth County high school in North Carolina. A total of forty class observations were made, ten class periods for each of the four teachers. Their students range from freshmen to seniors at all levels of ability.

In each class period, teacher behavior was monitored for signs of either a time conscious or eternal style, as noted by either on- or off-task behavior. The terms are used interchangeably here. On-task behavior includes taking care of school-related business and instructional time. On-task teachers show that every minute of the forty-five -minute

period is precious. Markers for such behavior include efficient management of time by multitasking (checking homework while students review for a quiz), quick transitions between activities, stating the day's objectives early, and monitoring time for students ("Take 2 minutes to discuss your responses with a partner."). Time-conscious teachers start class with the bell but are not rushed by it at the end of the period. Off-task teachers often lose track of time, end up on tangents during class, and distract students as much as students distract themselves. One marker of a teacher that is often off-task is that he or she is rushed by the bell at the end of the period, often trying to squeeze in one last point or announcement. Time-eternal teachers are recognized by lulls in classroom behavior, starting class randomly and slowly, spending too much time on "housekeeping" duties, and tackling small tasks one-by-one.

In order to gauge how a teacher's time-use affects learning, student behaviors were also monitored. Every five minutes, the researcher made note of the number of students engaged in off-task behavior. In preparing for these observations, the researcher first sought to define off-task behavior. These students display behavior such as engaging in social conversations, asking for hall passes, daydreaming, and putting their heads down on the desk. They do not have books or notebooks open on their desks, have their backs turned to teacher, and have their cell phones out. The researcher chose to count the number of students off-task, rather than on-task, in the hopes that such behavior would be the exception, not the norm, and therefore easier to pick out. The researcher also chose to observe the aforementioned behaviors in order to gauge student engagement because procedural engagement better lent itself to the nature of this observational study.

At the end of forty hours' observation and data-collecting, both teacher and student behavior was analyzed for trends with the goal of finding a correlation between teacher time-awareness and students' engagement levels. Teachers were categorized as either time-conscious or time-eternal by anecdote rather than numbers. Once their style was identified, the four teachers were then placed on a spectrum, in relationship to each other, from most time-conscious to least. The numbers of students disengaged throughout the research process were averaged. From this final, averaged number, the researcher learned the average number of students likely to be found off-task at any given moment in the teachers' classrooms.

Results

This study found no relationship between teacher time-management and student engagement. Teacher C was found to be the most time-conscious and efficient of the teachers, followed by Teacher A, Teacher D, and Teacher B. However, the level of student engagement found in each of these classrooms did not correspond in the same way. Teacher C had the highest student engagement, followed by Teacher B, Teacher D, and Teacher A.

Teacher C was the most time-conscious teacher and also had the highest levels of student engagement. Teacher C always had the school's clock on display and the objectives clearly stated on the board. She started class with the bell, ushering in tardy students with greetings like "I'm glad you're here, but hurry in." As students filtered in, Teacher C often took care of business with the students such as answering questions, passing back papers, taking late assignments and discussing absences. Teacher C kept track of time for her students, often saying things like "Let's get back to Milton. We only have twelve minutes and a lot to do." Teacher C was also never rushed by the bell at the end of the class. She showed the most impressive multi-tasking skills of the four teachers, proving that she really valued and could maximize each of the forty-five minutes of the period. Her execution of a simple vocabulary quiz is an excellent example of Teacher C's multi-tasking skills. Students knew her routine and began to review for the quiz as soon as they enter the classroom. While they reviewed, Teacher C made announcements, reminded them of upcoming assignment due dates, took questions and addressed the research paper timeline. As she called out the vocabulary words for the spelling portion of the test, Teacher C also passed out the definitions worksheet part. As the students finished, they picked up the worksheet for the following week's vocabulary words, got dictionaries from the shelf and worked quietly until everyone was done. Overall, Teacher C met each of the aforementioned criteria for this study's time-conscious teacher. As Figure 1 shows, Teacher C had 90% of her students engaged at any given time. These numbers made Teacher C the teacher with the highest student engagement. Although this high level of engagement corresponds with her position as the most time-conscious teacher, it is not a large enough difference for the study to claim a relationship.

Teacher B was categorized as the most time-eternal of the four master teachers. While the objectives were always on the board, there was never a clock on display. One day, Teacher B came in very excited to share with her students that over the weekend she had bought her first watch in years. Teacher B is a very sociable person and often seemed to distract her students with jokes and stories, more than they could ever distract themselves. Teacher B often started large tasks towards the end of the period and would always be cut off by the bell. During many of the class periods observed, Teacher B spent almost half of the period on "housekeeping" tasks with her students. Teacher B was by far the most time-eternal of all the teachers. However, this did not hurt her student engagement. As Figure 2 shows, 89% Teacher B's students were on-task at any given time, putting her only 1% behind our most time-conscious teacher, Teacher C.

Teacher A was the second most time-conscious teacher. However, she had the lowest student engagement, with only 81% of her students engaged (see Figure 3). One time, Teacher A was giving a vocabulary quiz and announcing the assignment students were supposed to complete afterwards. The students were so unengaged that they did not realize Teacher A had passed out the wrong piece of paper, thinking it was the quiz. If Teacher C was the best multi-tasker, Teacher A was the best marker of time. Teacher A was also good about starting with the bell, or sometimes just before it. About halfway through the semester, she began locking the door, allowing her to better catch late students. As the bell rang, she'd close the door and give the punctual students a quiz. The students would answer the questions together out loud and then write the answers on their own paper. After Teacher A collected the quizzes, she'd open the door and admit the late students into class. This ensured (in theory) that students who were on time would be guaranteed an A while students who were late would strive to be on time later to avoid failing. However, even after trying this a few times, up to half of the class was still late every time. Despite Teacher A's excellent time-management practices, her students were so unengaged that they became rude discipline problems.

Implications

This study has made three things very clear: teacher time-management and student engagement do not have a strong relationship; teachers are modeling some strong

time-management behaviors, as they should be; and more studies should be done on this subject at the secondary level.

First, this study did not produce a strong relationship between teacher time-management and student engagement. Teachers A and B were the best example of this. Despite Teacher A's strong time-management behaviors, her classes were unengaged to the point of disorderly. However, Teacher B's time-eternal tactics did not discourage student engagement. This leads the researcher to conjecture that other, uncontrollable factors must be at work here. For example, from watching the students interact with the teachers, it is obvious that Teacher B has built a much stronger relationship with her students than Teacher A has. Teacher B's students respect her more and therefore are more engaged in her lessons.

Second, teachers are modeling some strong time-management behaviors, which the literature shows is good for both teacher and student. Three of the four observed teachers demonstrated consistent time-management behaviors. Even time-eternal Teacher B occasionally slipped into time-consciousness. Even though this study found no strong relationship between teacher time-management and student engagement, the literature shows that time-management is still a very valuable skill for students to learn. And students learn best when teachers model the skills first.

Finally, more studies should be done on this subject at the secondary level. A lot of literature can be found for the tertiary level but there is far less for the secondary. Also, future studies should focus on Nystrand and Gamoran's idea of substantive engagement. According to their studies, that is when students are doing their best learning. Future studies should also be conducted with a larger population. A larger population and more classroom observations could help control for outlying factors that could not be regulated in this study.

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Reading Instruction in the Secondary Spanish Classroom

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The importance of foreign language education in the United States has increased substantially as our culture continues to become more global. As a result of the demand for language proficient citizens, more attention is being given to the development of students' proficiency in a foreign language in grades K-12. To guide states and districts in establishing strong programs of study, the American Council on the Teaching of Foreign Languages (ACTFL) led the development of the *Standards for Foreign Language Learning in the 21st Century(1996)* which represents the content knowledge students should possess in a foreign language upon completion of their language program. The *Standards* address five goal areas: Communication, Cultures, Connections, Comparisons, and Communities (ACTFL, 1996). Following the national standards, ACTFL designed the *Performance Guidelines for K-12 Learners* (1998) to gauge student progress in the five goal areas according to the following levels of proficiency: novice, intermediate, and pre-advanced (ACTFL, 1998). Within the Communication goal, students are expected to be able to use the target language to speak, listen, read, write, and to reflect a deep understanding of the culture as integrated components of language development (ACTFL, 1998).

Literacy is an essential part of one's proficiency development in a foreign language because one must be able to read and comprehend the written language. Readers must rely on many factors to bring meaning to the words in the text, including knowledge of the target language, personal experience in the world, experience with various types of texts, short-term memory capacity, and ability to use different reading strategies (Shrum & Glisan, 2005). If students are to become both globally aware and proficient in a foreign language, it is essential that they be taught how to effectively read culturally relevant and linguistically challenging texts in the foreign language.

Review of Literature

Barnett (1986) states that a number of factors should be considered when planning instruction to support the development of reading ability in a foreign language. Among them, perception of print, reader's background knowledge and interest in the text, individual facility with reading strategies, and language knowledge (grammar control and vocabulary range) are fundamental and interrelated when assessing student comprehension of texts. The foreign language teacher can assist students in the development of literacy by providing linguistic support through the use of visual cues such as pictures and video clips as well as by providing relevant cultural background which can aid them in comprehending meaning (Shrum & Glisan, 2005). These strategies can also assist readers in making connections to their prior knowledge, thus helping them to deepen comprehension of meaning and strengthen recall ability (Barnett, 1986; Trayer, 1990; Evans & González, 1993).

Research shows that there is a constant interaction between the reader and the text and, therefore, it is important for foreign language teachers to provide strategies that assist students in the reading process (Trayer, 1990; Evans & González, 1993; Carrell, 1984). According to Knutson (1993), the modern perspective on foreign language reading emphasizes this interactive nature of the reading process and the reader-based factors that contribute to construction of meaning. In other words, reading is not simply a process involving linguistic decoding, but involves comprehension of textual messages (Knutson, 1993; Bernhardt, 1984). An efficient reader does not read individual words in a text for isolated definitions; rather, he uses his prior knowledge of the topic, vocabulary, grammar, and cultural context to understand the broader meaning (Schulz, 1983; Trayer, 1990; Elley & Mangubhai, 1983; Schulz, 1991). Instruction geared toward global comprehension, rather than grammatical constructs, can better assist students in comprehending the broad ideas of a text

Communication involves cultural perspectives that determine how messages are understood and interpreted. Teaching students to use prior knowledge to contextualize cultural topics, a process called *activation of schema,* will not only assist readers in understanding the passage more deeply but will also help them to construct plausible

meanings for unfamiliar vocabulary words (Carrell, 1984; Bernhardt, 1984; Barnett, 1986; Hammadou, 2000; Lee, 1988; Johnson, 1982). Foreign language teachers should activate their students' schema and facilitate student comprehension of reading material by using a variety of pre-reading and while-reading strategies to guide students' thought processes and to monitor student comprehension of the material (Barnett, 1988).

Pre-reading strategies are building blocks to the use of successful approaches to a foreign language text and also provide context for the reading selection. By incorporating various pre-reading strategies such as highlighting key words, searching for cognates and context clues, viewing pictures and video clips, and using graphic organizers to focus on details, teachers can assist students with understanding, assimilating, and evaluating new information in the reading material (Carrell, Pharis & Liberto, 1989). In addition to pre-reading strategies designed for activation of schema, foreign language teachers should also use while-reading strategies to develop students' metacognitive ability and to monitor their interpretation of a text as they interact with it. When students are able to generate ideas about what they already know about a topic before reading a text, and when they are taught how to look for themes and check for meaning while reading a text, they are better prepared to read for meaning as their proficiency level increases (Carrell, Pharis & Liberto, 1989; Barnett, 1988; Trayer, 1990). Researchers agree that it is important for students to be trained how to approach a text in order to become proficient readers in the foreign language, that target cultural values are best represented by authentic texts, and that teachers should provide students with explicit strategies for approaching different kinds of texts (Evans & González, 1993; Knutson, 1993; Trayer, 1990; Barnett, 1988; Brantmeier, 2003; Schulz, 1983; Carrell, 1984).

If students are to become proficient readers in a foreign language, it is important to expose them to various types of reading material early in their language study and to guide them through well-planned pre-reading and while-reading strategies in order to assist them at arriving at meaning. The purpose of this study was to investigate instructional strategies used by secondary level Spanish teachers to develop students' reading ability during the pre-reading and while-reading stages.

Methodology

This research study took place from September through December 2008 in a public school district in central North Carolina. The subjects were eight public high school Spanish teachers who teach Levels I through Advanced Placement Spanish Language and Literature. Once permission and informed consent were acquired, the researcher conducted a two-tiered study. The researcher interviewed each subject for approximately one hour using a self-designed interview instrument consisting of eighteen questions to determine reading strategies used by the teachers. The researcher then observed five teachers in the classroom for one hour to determine which reading strategies were incorporated into their daily instruction practices. After all data were collected, they were synthesized and coded for themes pertaining to reading strategies and compared with current literature about the use of pre-reading and while-reading strategies in foreign language instruction.

Results

The interview portion of the study yielded positive results about teacher knowledge of and attention to the *National Standards,* the *Performance Guidelines,* and the *North Carolina Standard Course of Study for Second Languages*. Teachers responded that they incorporate a variety of authentic reading material whenever possible and use a wide range of pre-reading and while-reading strategies to assist students with comprehension of meaning. These responses correspond positively with current research about the importance of reading strategy instruction and its positive effects on the overall language development of students at all levels of study. Thus, the researcher concluded that the teachers are aware of the importance of reading instruction in developing student proficiency.

The researcher noted discrepancies between some interview results and observation results in that some teachers use pre-reading and while-reading strategies when presenting reading material to their students, while others present reading material as time allows and do not consistently use pre-reading and while-reading strategies. The researcher concluded that teachers of lower levels of Spanish are less likely to incorporate reading material due to their students' low proficiency level and tend to focus on the development of basic grammar and vocabulary skills. While all teachers of

Spanish Levels III, IV, V, and Advanced Placement stated that they incorporate reading material often and that they use pre-reading and while-reading strategies to assist their students in comprehension of meaning, the researcher observed that teachers may not use pre-reading and while-reading strategies each time they present reading selections and that reading material may not be incorporated as often as was stated in the interviews. The researcher maintains that all teachers in the study may indeed incorporate such strategies during reading instruction, and that reading material may be incorporated regularly; however, during the limited observation periods, not all teachers engaged in such practices. In order to more fully investigate reading instruction in the secondary Spanish classroom across all levels of Spanish, it would be necessary to observe classes for prolonged periods of time in order to fully ascertain and analyze the methods that teachers employ to teach reading and to observe actual student outcomes over a period of time.

Conclusion

The field of foreign language education is making progress toward meeting proficiency goals outlined by the *American Council on the Teaching of Foreign Languages* and the *North Carolina Standard Course of Study for Second Languages.* The development of reading ability is essential to one's overall proficiency development in a language. It is important that teachers focus on specific strategies that consciously help students build this ability. This study yielded positive results about secondary Spanish teachers' work in the development of reading proficiency in this district. The researcher is encouraged that teachers are aware of the importance of incorporating pre-reading and while-reading activities to assist students in arriving at meaning within any type of text in the Spanish classroom. The researcher concludes that teachers in this district are striving toward developing students' overall proficiency across all levels of Spanish, but that further research would be necessary to determine the extent to which lower level Spanish courses in this district prepare students for the reading material they encounter as they continue their study of the language. The researcher would also suggest further investigation into the frequency of incorporation of reading material in this district, because the observations in this study were abbreviated.

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Real Life Connections in the Algebra II Classroom

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The National Council of Teachers of Mathematics has published six principles and ten standards that mathematics teachers should use as guides in their classrooms. Within the Learning Principle, NCTM states that "all students should be expected to understand and be able to apply mathematics" (2000, p.20). The idea of real world connections is repeated throughout the NCTM standards and is explicitly stated again in the Connections Standard which states that "students should be able to recognize and apply mathematics in contexts outside of mathematics" (NCTM, 2000, p. 64). Therefore it is important that teachers utilize real world connections in their classroom.

There are many reasons that real world connections should be a vital component of a mathematics classroom. Applying math to real world situations helps students reinforce mathematical concepts and strengthens their understanding (de Lange, 1996). Another justification for real world applications is that there is an increasing need for all students to be literate in 21st century skills. Students will be exposed to numerous statistics, global data concerning currency, and other types of information that will necessitate a strong understanding of math to be able to interpret and understand the information (Blum & Niss, 1991). Real world connections help students become engaged and motivated with regard to mathematics (Hiebert, Carpenter, Fennema, Fuson, Human, Murray, Olivier, & Wearne, 1996; Moschkovich, 2002). Incorporating math applications into the classroom helps students see the purpose behind learning mathematics and provides for variety in the classroom. Lastly, the incorporation of real-world connections gives students the opportunity to practice using math outside of the classroom and work on problems that are open-ended and have multiple solutions (Blum & Niss, 1991; Moschkovich, 2002).

Despite the obvious benefits of incorporating real world connections into the math classroom, many classrooms lack mathematics applications for a variety of reasons.

Usiskin (1997) acknowledges that finding real world connections for upper level secondary mathematics courses is challenging. Even when applications do exist, many teachers do not know about them due to their lack of training in applied mathematics (Usiskin, 1997). Another obstacle to real world connections is the time constraints of mathematics courses (Blum & Niss, 1991). Many teachers do not feel like they have enough time to cover the curriculum without trying to incorporate applications.

Even when teachers do incorporate real world connections into their classrooms, they may do it poorly. Carraher and Schliemann (2002) state that when real life problems are brought into the classroom, they are approached differently than if approached outside the classroom. Teachers manipulate the problems so that they are easier to comprehend or better "fit" the concept that the class is currently learning. Other teachers or textbooks "dress-up" pure mathematics problems in the language of everyday life and therefore give a distorted view of reality (Blum & Niss, 1991; Moschkovich, 2002).

Applied mathematics not only helps increase students' motivation but it may also be effective at helping students master mathematical concepts. Lightner (1998) conducted a study that compared General Mathematics I to Applied Mathematics I in rural Oklahoma high schools. The Applied Math I students scored statistically higher than the General Math I students when examining the cumulative total of their scores on the exact End of Course Exams. Lightner (1998) concluded that applied math could be substituted for general math without any negative consequences.

Most teachers subscribe to the utility and necessity of incorporating real world connections into their classroom. But constraints such as lack of resources, applied math knowledge, time, or preparation for a standardized test prevent teachers from actually incorporating real life applications or when they do, "they are brief and require no action or thinking by the student" (Gainsburg, 2008, p. 215). In order to improve this condition, it is important to examine the use of applications in math classrooms. This study will utilize teacher interviews to determine how often and in what ways Algebra II teachers incorporate real world connections into their curriculum.

Methods

All Algebra II teachers at four high schools in a large school district were sent an email asking them to participate in the study. Teachers who volunteered participated in

an interview lasting approximately twenty minutes. The interviews were done on a one on one basis and were recorded electronically. The interview consisted of eight questions concerning real world connections in the Algebra II classroom.

The researcher then compiled and organized the data. The data was analyzed by organizing the material into sections and the main ideas were underlined. Then, the researcher generated themes that were recurrent in the data. Each part of the data that corresponded with a different theme was marked appropriately.   A concept map was created that illustrated the major themes and sub-themes and presented the appropriate data to support these themes.

Results

Overall, teacher responses indicate that teachers believe in the benefits of real life applications and state that they incorporate real life connections into their classroom. Five out of nine teachers say that they incorporate real life connections on every topic. However, many teachers admit they employ real world connections in a limited capacity, namely word problems, due to the existence of the End of Course test and its format of real life applications which is word problems. Through analyzing the teacher's responses to the interview questions, seven themes emerged concerning real life connections in the Algebra II classroom.

The first theme is that the majority of students do not see the utility of math especially Algebra II. Teachers gave evidence for this lack of connection by stating that students constantly ask, "When are we going to use this?" or "Why do we have to learn this?" These questions indicate that students have not had previous experience applying the math that they learn in school. Thus, teachers said they like to incorporate real life applications as much as possible to help students see the usefulness of mathematics in the real world. Most students do not require Algebra II in their everyday existence and thus have difficulty seeing the utility of math. Teachers believe it is important to show them that math, specifically Algebra II, can be used to solve problems that they encounter on a day to day basis and it can be used to solve problems that they have never thought about but that are important problems nevertheless.

The second theme to emerge was that applications for the Algebra II curriculum are not always available. Teachers stated that it is hard to find everyday problems that

require the use of Algebra II. Some parts of the curriculum translate well to real world applications whereas other components do not. For example, the statistics portion of Algebra II is easy to connect to real life and can be found in almost any newspaper. Other topics, such as simplifying radical expressions, are mathematics skills that are mostly used by college graduates in specific professions.   If a student is not headed to college or to that particular profession, it may be impossible to find a problem in which they can relate. Most teachers interviewed stated that they do not use Algebra II in their regular lives outside of school which illustrates their point about the feasibility of real world connections. Five out of nine teachers specifically stated that they have never had a profession besides teaching so they do not have other professional experience in a mathematical field in which to draw applications.

Another theme present in the results was that most applications are simplified or manipulated for the purposes of the classroom. Thus, "real life" connections are not real life at all and students may not be exposed to the utility of Algebra II. One teacher stated that students do not understand application problems until the teacher paraphrases the problem. The teacher is translating the problem into the specific mathematical language that they use in class in order for the students to solve the problem. By paraphrasing the application problems, the teacher is not developing critical thinking skills that would allow the student to interpret the terminology used in the problem and use their mathematical knowledge to solve.

Two contrary themes were present among the responses. Some teachers indicated throughout the interview that real world connections increase student engagement while other teachers stated that students hate word problems and shut down when they are asked to work an application problem. One teacher, who said that applications increase student engagement, provided an example of an application problem she gave her students when they learning how to calculate percentages. Students were asked to pick their favorite store, "buy" an item, calculate sales tax, and then present their findings. Students became really interested in the topic and were amazed to discover that some of their classmates also had the same favorite store. The teachers who said that students are scared of application problems and become frustrated did not give concrete examples of this happening in the classroom. One theory to explain the differing views of real life

applications is the capacity in which they are employed in the classroom. If teachers are only using word problems to expose students to real life applications, then students will be less likely to be interested. If teachers assign projects or have the class participate in experiments that connect Algebra II to the real world then students are an active part of the learning process and will be more likely to be engaged.

The last two themes were interconnected: the existence of the End of Course test and the amount of time involved in real life applications. Seven out of nine teachers stated that the EOC influences the amount of real life applications they use in their classroom. Since the EOC exists, teachers must cover all the topics that will appear on the EOC. Also, all of the applications problems present on the EOC are in a word problem format with multiple choice answers. Teaching real life applications of mathematics in addition to the pure mathematical topics requires time. It takes extra time to plan, teach, and grade the real life connections. Teachers stated that they do not have time to do both real life applications (in a capacity besides word problems) and cover all the topics that will be present on the EOC. The one teacher interviewed who had been an engineer before he became a teacher had a plethora of real life connections he wanted to use in his classroom but he said he did not have the time. Students are exposed to real life applications in a format that is not indicative of a true real life problem. Problems that are encountered in everyday life can be solved using multiple strategies and often have more than one right answer. A multiple choice test does not allow for more than one right answer. This makes some word problems even more unrealistic.

Conclusions

The teacher responses in this study confirmed the literature on the topic of real world connections. The majority of teachers believe in the incorporation of real life applications and state that they do utilize real life connections in their classroom. However, these connections are merely associations rather than real life problems. Instead the "real life" connections are analogies, word problems that have manipulated and simplified the actual situation, or problems that students will never encounter in their everyday lives or future professions. Teachers believe that they are exposing the students to real life applications when in reality, they are only making references to many applications that students will never encounter due to the basis of the mathematical

curriculum being pure, academic mathematics. Another confirmation of the literature was the difficulty that teachers have when trying to create real life applications of the curriculum. This study indicates that teachers need more training on developing and teaching real life applications.

Real life applications are central to a successful mathematics curriculum due to the nature of real life problems. Real life problems require higher order thinking skills and train students to think strategically. However, the details involved in incorporating these applications in a way that retains the real life aspects while effectively increasing student engagement and learning are not clear. There is not a set method for teachers to follow when trying to incorporate real life applications into the classroom. It would be interesting to examine teachers who are successful at employing real life connections in their classroom.

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How Teachers Are Using Digital Primary Sources

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A primary source is a first hand account of a past event or era. Primary sources can come in the form of letters, photographs, audio recordings, and newspapers among other things. Teachers have long seen the value of being able to have their students hear about an event or time period in "the own words" of someone who was there. Until recently it has been harder for teachers to use primary sources beyond predictable ones. Unless a teacher had time and access to archives, it was hard for him to use a diverse range of primary sources in his lessons and assignments. The information age has all but obviated that problem. (Cohen & Rosenzweig, 2006) With the amount of material available online rapidly increasing and with near universal Internet access at school (Wells & Westat, 2006), a teacher in rural Montana has more information available to her at the click of a mouse than she would have had access to had she been in the largest library in the world twenty years ago.

What is worthy of continuing study is not the fact that this information is there but how this information is being used in actual classrooms. This topic has been studied extensively by researchers but is still worthy of further study because of the rate that content and technology change and because of differences between schools in different states and in different districts. This study looks at how and why teachers choose to use these sources in their classrooms through a series of in-depth case studies conducted in the Winston-Salem Forsyth County School System in central North Carolina.

Review of Literature

With the rise of the Internet, primary sources have become much more accessible, and there has been an explosion of research into what is available and how it is being

used. There are many different types of source material available online. (Veccia, 2004) These digital sources have been studied from many different angles.

An important category of literature is the plethora of general guides that have been written about using digital primary sources. These guides also discuss the Internet's promise and pitfalls. (Cohen & Rosenzweig, 2006)The most cited strength of this resource is the amount of material that is readily accessible. A 120gb hard-drive can fit the same amount of information that a 120,000 volume library can. (Cohen & Rosenzweig, 2006)

Information on technology and Internet in schools is also very applicable to this topic. According to statistics, access to the Internet has become ubiquitous in American public schools. (Wells & Westat, 2006; Parsad & Jones, 2005) The ratio of students to computers is being reduced at a rapid rate. By 2005 there also was a nationwide average of 3.8 students per Internet enabled computer compared to 12.1 only six years earlier. (Wells & Westat, 2006) Statistics such as these have a tremendous bearing in understanding how teachers use primary sources.

The so-called digital divide has also been given a lot of attention. Digital divide is a term used to describe a disparity in Internet and technology access. Some of this is race and language based. (Ono & Zavodny, 2007) For instance, non-English speaking students are much more likely to lack Internet access. The second part of it is the tremendous divide between what resources are available in different schools. This effects how teachers use technology. A recent study by Friedman (2006) found that teachers found primary sources useful but that those who had better access to technology used them more and that access to more technology not technical skill was the main factor in how they used technology.

Methodology

The initial component of this project was a survey that was sent out to all social studies teachers in the Winston-Salem Forsyth County School System in the first week of October 2008. While the survey provided data that was useful in this project, one of the primary purposes of sending it out was to find teachers who were willing to participate in a more in-depth study.

Of the educators who responded to the survey, six agreed to participate in the full study. The six represented a broad cross-section of teachers in the county and represented four schools. The interview component of this project was straightforward. The teachers who volunteered were interviewed for roughly twenty minutes on their use of primary sources in general and digital primary sources in particular. Most of the interview was scripted but it was not rigidly scripted.

Results

The survey component of this project did not garner enough responses in order to draw any large conclusions from but it did provide useful information. Respondents ranged in experience from one in their first year to one in their thirtieth year and averaged nine years of experience. Five of the nine taught US History while two taught Geography, two taught Civics, one taught IB History of the Americas, and another E.C. Inclusion. Everyone surveyed used some form of primary sources in their teaching though the ways they obtained sources varied. All of those surveyed obtained primary sources from textbooks, 89% obtained sources from the Internet, and 78% got them from ancillary sources such as readers. 44% of respondents said they used primary sources regularly, 44% said they used them sometimes, and 11% said they used them infrequently. Only one teacher said they used digital sources very often. 44% said they used those sources sometimes. 33% said they used them infrequently and one person said they never used them. While the sample size was too small to draw large conclusions it does suggest that digital primary sources are not a major component of the strategy of high school Social Studies teachers.

Interviews confirm this observation. The six teachers interviewed were a diverse group. They ranged from being in their second full year teaching to being in their nineteenth. They represented four different schools running the spectrum from a predominantly minority and extremely low-performing inner-city school to a predominantly white and high performing suburban school, they taught a range of different courses including US History, Civics, World History, and Business, and had a range of styles.

Only one teacher of the six does not use any digital primary sources in his teaching.

He does not because he says he lacks technical ability and does not know what is out there. Another only uses them in a more passive form. For instance he might use the Internet to find something to print and hand out to students or might make a PowerPoint. He does this because he found that it was hard to keep kids focused in computer lab settings. The other four use digital primary sources in more active ways. Three teachers mentioned online databases such as SAS Curriculum Pathways and Galenet. SAS is a subscription site that is free to all public schools in North Carolina. The site contains links to content sites that have been vetted for quality and age appropriateness and provides an abundance of pre-made lesson plans and projects that are designed to be done online. Galenet is akin to an academic Google. It is a search-engine of vetted content and teachers rate the quality and usefulness of sites with a star rating system.

These databases are popular in part because they are convenient. Convenience was a major theme that was mentioned by teachers who use these sources. Many said that they used these sources in part because it was easy to gain access to a broad variety of sources and to incorporate them into their teaching. Or they used them because it was much easier to get students to do a research assignment online than it was to have them do it a more traditional way. These academic databases make it even easier for teachers because they filter out unsafe and inapplicable websites and make it easier for teachers to quickly find useful and accurate content. End of grade test concerns were also brought up by multiple teachers in this study. The importance placed on the results of end of grade testing and the vast amount of material that teachers are charged with getting through made some feel constricted in their ability to use digital primary sources.

One teacher emphasized that problems with technology in his school functioning properly was a hindrance to his use of digital primary sources while another said that he did not use them in part because he was not familiar with what was out there and lacked technological knowledge. Beyond that other teachers expressed satisfaction with the level of technology available to them and their ability to use it.

Implications

While this study was focused on a few teachers and did not have a big enough sample size to draw any large generalizations there are several themes that were repeated

in these interviews and there are some recommendations that can be drawn from this data. Teachers mentioned that a key reason to use digital primary sources was convenience. The Internet in general, and sites such as Galenet and SAS in particular, make using primary sources easier than using print sources and make it much easier to find and deploy a diverse range of sources. For this reason it makes sense for there to be more investment in centralized and easily usable databases of primary source material. Putting more material online is also advisable. Centralized databases also make it easier for student research projects. Students now have access to material at school that they would never have been able to access a few years ago. This means that they can research more diverse topics and research them in a more thorough way. The pitfall is the sheer volume of material available online and the fact that some of it is of questionable veracity. Databases such as Galenet help with this issue. They allow this because content is vetted in terms of quality, accuracy, and safety.

There have been a lot of studies on digital primary sources but more need to be done. In particular it is worth looking at how time constraints and the type of school involved affect digital primary source use. Multiple teachers mentioned time constraints caused by the North Carolina end of course tests in US History and Civics as an issue that affected how they use these sources. For issues of time and reasons related to class size, access to technology, and expectations it would be useful to compare how these sources are used in private schools as opposed to public schools. Perhaps freed from some of those state curriculum burdens, teachers would feel more free to experiment with digital primary sources. Or perhaps these studies would show the EOC time constraint argument to be overstated.

Conclusion

Information technology has revolutionized education. It has provided teachers with new ways to present information, new ways to find information, given them access to material they did not have access to before, and given them new ways to have students learn to process and analyze information. Social Studies is a subject that lends itself to the use of this technology and one way that teachers have chosen to use information technology is through the use of digital primary sources.

The in-depth interviews that form the bulk of this essay largely confirm earlier research. Teachers found the pedagogical value of digital primary sources to be much the same as the pedagogical value of print sources. Almost all use them but few used them extensively. Through talking with teachers and through analyzing survey data I found that a main reason that teachers use these sources is because they are convenient. Many teachers preferred to use academic databases that filtered information and allowed them to find what they wanted in an even more efficient fashion. Reasons that teachers did not use these sources included time pressures and issues with access to technology and technological knowledge.

In part because the amount of material available online, more study is called for. In particular it would be useful to see more on how state's constraints affect how these sources are used. In other words it would be useful to consider how a more stringent testing regime that requires students to know a broader amount of content affects how a teacher chooses to use these sources.

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Content Terminology: Beliefs and Practices of Teachers in the Field

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The North Carolina Standard Course of Study support document for United States History contains well over 800 terms and concepts deemed, "factual content." Understanding the beliefs and practices of teachers' approach to teaching the content terminology prescribed by the state is an important step in identifying how improvements to vocabulary instruction can aid in student understanding of history, and hopefully increase the number of students who successfully pass the required history courses.

Literature Review

Social studies teachers work to provide an essential opportunity to provide students the skills necessary "to make informed and reasoned decisions for public good as citizens of cultural diverse, democratic society in an interdependent world" (National Council for the Social Studies, 1995, p. 3). The specific study of history allows students to gain insight and provides the context for understanding the present (Singer, 2003).

Standardized tests are also an integral part of the 21st century social studies landscape in public schools (McCoog, 2005). The pressure of testing has made teachers feel that they must neglect teaching topics not on the test racing to complete the dictated curriculum (McMillan, Myran & Workman, 1999).

Researchers have shown that most textbooks take a more traditional approach to vocabulary definition, requiring students to make a "giant leap" in understanding (Harmon, Hedrick, & Fox, 2000, p. 265). It is therefore important to examine the methods teachers use to help students gain comprehension beyond simple definitions in order to support conceptual understanding (Harmon, Hedrick & Fox, 2000). The North Carolina Department of Public Instruction's curriculum support document for United States history contains a list of over 870 terms deemed "factual content." Loewen (1995) laments that facts become "simply as one damn thing after another" (p. 15).

Teachers continue to attempt the teaching of content specific terminology, believing that understanding terminology provides an essential basis for understanding larger concepts presented in reading (Harmon, Hedrick & Fox, 2000) Mezynski (1983) suggests that vocabulary instruction can improve reading comprehension. While "drilling" may produce faster results, using multiple exposures can allow students to decontextualize knowledge about a word's meaning, allowing the idea to expand beyond a simple definition (Stahl and Fairbanks, 1986, p. 76).

Being able to apply meaning to different contexts can help social studies student to better understand key social studies concepts (Harmon, Hedrick & Fox, 2000). Students can only master the vocabulary when they can apply the knowledge to a series of different tasks, eventually gaining insight into how that specific concept is related to the larger context of history (Harmon & Hedrick, 2000). Allowing students to engage in what Stahl and Fairbanks (1986) call the "depth of processing" framework could increase retention rates (p. 75). "Depth of processing" is related to the study of short term memory.

Textbooks that do not make efforts to provide a link between the new content and a student's previous experiences or prior knowledge prevent the student from being able to apply information other situations (Loewen, 1995). Understanding history is dependent upon knowing content specific terminology (Harmon & Hedrick, 2000; Ediger, 2002). However, "true historical understanding is required to engage in historical thinking" (National Center for History in the Schools, 2005). This study elucidates how teachers in the field are teaching vocabulary within social studies and how they make improvements in instruction to benefit the student.

Methodology

The accessible population was limited to a school district in the South that has both city and rural high schools averaging 1,025 students. After approximately one month, six responses to an emailed request for participated were received from teachers at four different high schools. Two groups were formed based on experience level, each group consisting of three teachers each was subjected to a simple random sampling process (Gay & Mills, 2009).

During observations, notes recorded the events in the classroom. Additionally, the North Carolina Standard Course of Study Curriculum Document was available to track "factual content" that was discussed during the course of each class. Observations noted any repetition, introduction, definition or explanation of key terms. After all observations had occurred, an interview was scheduled with each teacher. The results of which were then emailed to the teacher to approve in an attempt to triangulate the data. The narrative data was then coded to produce themes.

Research

Three distinct themes emerged: review, context and repetition. For this study, review is considered any attempt on the part of the teacher to re-introduce old information into a new lesson. Context is considered any attempt to link new terminology to prior knowledge either historical or personal. The last theme, repetition is when the teacher uses a term and/or its definition more than once during the lesson. Themes should not be regarded as independent of each other since most of these methods were used in tandem with others. For example, a teacher may repeat a term several times after it has been presented in the context of a selected reading passage.

Review

In most of the lessons observed, each teacher spent time reviewing specific terminology. Teacher A reviewed questions from the textbook, emphasizing and elaborating on key terms presented by the question. One question simply asked, "how many electoral votes does it take to get elected?" The correct response was given (270), and the teacher elaborated. Population determines electoral votes, and the term "proportional representation" was used to reflect this idea. In about three minutes, the students were able to review two distinct terms and content ideas. Teacher A also gave "sound byte" definitions. For example, *habeas corpus* was simply defined as "charge me or release me," and *filibuster* was defined at "talking a bill to death." Teacher C maintains a running list of key terms on the board for each unit which is reviewed at the start of class.

Teachers B and D both identified key terminology that related to that day's lesson. In Teacher B's classroom, the objective was listed on the board, as well as the term "shogunate." While the term was new, the teacher first reviewed the term "feudal"

with the students. After the students discussed the key points of feudalism, the students were then introduced to a difficult culture's conception of the idea: shogunate.

During interviews, several teachers spoke about the importance of review in their classrooms. Teacher C uses quizzes to force the students to review terminology for the end of course test. Teacher A structures his lessons over the course of a year so that each vocabulary term is used 12 times. According to Teacher A, review is essential; "Civics is close to a math class in the sense that what you do in Chapter One, you add to in Chapter Two. You continually add to the content, they are not independent."

Context

Perhaps the most widely observed theme regarding the teaching of vocabulary was the use of context, as each teacher was observed using context to teach or review vocabulary during each observation, for a total of 14 times. Most often, context can also be used to describe a teachers' attempt to access a student's prior knowledge to provide context. Students were encouraged to take the terminology they had been learning in class and apply it to a new context. When introducing a term, such as "Underground railroad," students in Teacher C's class was given the opportunity to tell the teacher everything they knew about that particular term. Teacher C was then able to use that information to provide a connection, and even correct student misconceptions. In Teacher B's class, students were asked to write about the qualities they desired in a leader. Teacher D similarly used what he called an "activation of prior knowledge". In this activity, the students were asked to write about a time when they had felt intimidated by authority.

Less often, terms were introduced within relevant reading or discussions. Teacher A assigned students to complete practice end-of-course test questions at the end of the chapter being studied. While Teacher A may have intend to provide context here, many students were observed flipping through the text trying to scan for the appropriate answer. More effectively, the Teacher C would provide a short reading, and then engage the students by asking questions about what they read. Teacher D stated that he tries to incorporate terminology into role playing activities. This forces students to create context for the vocabulary they are learning. It also provided him with an opportunity to see how the students interpreted the information they were provided.

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Repetition

Repetition could be considered a form of review; however, this theme was strong enough to warrant a separate category. Stepping beyond what was discussed as review; repetition was a distinct method most teachers used at some point during a lesson. Teacher C would define the term "Dred Scott," slowly stating the desired definition: "Supreme Court case where the Supreme Court ruled that slaves had no constitutional rights and cannot sue in court." After giving the definition once, Teacher C would repeat it again, however this time he would emphasize certain parts of the definition: "*Supreme Court* case where the Supreme Court ruled that slaves had *no constitutional rights* and cannot sue in court." During Teacher D's lesson, the term "irrigation" was used. Based on his students' reaction when the term was introduced, he took the time to define and repeat the word six more times during class.

Relation between interview and observation

In most cases, responses to interview questions reflected the themes apparent during observations. Most teachers specifically referred to ideas of context and review. Teachers A, C, and D stated that they believe the breadth and depth of both United States History and World History is too much. Rather than emphasizing terminology, the course should emphasize concepts. Teachers A, C and D all expressed a desire for the knowledge gained in the course to translate to the real world.

Discussion and Implications

This study demonstrates that some of the issues presented by the literature are being acted on in the field. It is apparent from both observational data and interviews that review is central to teaching in the classrooms observed. Rather than "drilling" teachers chose to provide multiple meaningful exposures to a particular word (Harmon, Hedrick and Fox (2000). These efforts will help students to decontextualize terminology, leading to a stronger likelihood of application beyond the classroom, which was a stated goal of several teachers.

It would appear that the teachers in this study have a philosophy concurrent with that supported in the literature when approaching terminology in the social studies classroom. The literature states teachers should provide multiple exposures to content and provide context for terminology are ways that teachers can help support long term

retention and promote historical understanding (Harmon, Hedrick, & Fox, 2000; Harmon and Hedrick, 2000; Stahl and Fairbanks, 1986). Research regarding vocabulary teaching was not specific to the social studies classroom. Due to the lack of study in this area, it would prove beneficial to further examine how teachers approach teaching terminology in social studies classrooms at the secondary level. Further emphasis could be placed on the assessments made by teachers. It would be worth investigating if these assessments continue to reflect the terminology approaches emphasized by the teachers.

Upon returning to the classroom, the research will work to incorporate terminology in an effective manner by using review, context and repetition. This study has taught me that spending time on terminology in some way will possibly have a positive effect on my students' success. While the courses are difficult to cover, the time spent on terminology will allow for greater understanding and success when the students attempt to apply knowledge to situations that involve higher levels of thinking.

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Implementing Inquiry in the Biology Classroom

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The National Science Education Standards (NSES) have called for science educators to use inquiry methods in instruction. Research in the field of inquiry has shifted from the effect of inquiry instruction to the dynamics of inquiry teaching and how to implement inquiry teaching (Anderson, 2002). Gejda and LaRocco (2006) have called for research into the inquiry practices of teachers in classrooms specifically through observation to measure the use of inquiry by teachers. This study identified the types of inquiry used by teachers in one North Carolina school district, how this inquiry was implemented in Biology classes, and addressed obstacles involved with implementing inquiry.

Literature Review

The National Science Education Standards identifies two facets of inquiry. Scientific inquiry is defined as both "the diverse ways in which scientists study the natural world and propose explanations based on evidence derived from their work" (National Research Council, 1996, p. 23) and as "the activities of students in which they develop knowledge and understanding of science ideas" (National Research Council, 1996, p. 23). Inquiry is therefore both a learning goal as well as a learning method for science education. There are many variations in the amount of guidance a teacher can provide for students within inquiry. These variations in teacher guidance define different types of inquiry activities.

Martin-Hansen (2002) defines four different types of inquiry activities: structured inquiry, coupled inquiry, guided inquiry, and open inquiry. These different forms of inquiry exist along a continuum defined by the roles assumed by students and teachers (Martin-Hansen, 2002; Bell, Smetana, & Binns, 2005). Movement from structured inquiry, guided inquiry, and coupled inquiry to open inquiry shows a shift from teacher centered instruction to student centered instruction. In structured inquiry, teachers

provide students with the question to be addressed as well as a procedure to follow (Bell et al., 2005). Martin-Hansen (2002) refers to this type of inquiry as a "cookbook lesson" where students simply follow directions to reach a specific answer. Guided inquiry allows students more control in the investigation. Teachers typically provide the students with a question but students help the teacher in deciding the procedure to follow for the investigation (Martin-Hansen, 2002). Coupled inquiry includes both guided inquiry and open inquiry (Martin-Hansen, 2002). First, the teacher leads the students in a guided inquiry investigation. After completing and discussing the results of the guided inquiry investigation, students develop their own questions for an open inquiry. Open inquiry represents a completely student centered approach to science (Martin-Hansen, 2002) where students design investigations to answer questions they developed about a topic (Bell, et al., 2005).

Many teachers experience problems in implementing inquiry into the classroom (Wallace & Kang, 2004). External factors that make implementation difficult include a range of obstacles such as lack of resources, standardized assessment, teacher content knowledge, pedagogical concerns and classroom management (King, 2007). Teacher values and beliefs are internal factors that caused problems with inquiry (Anderson, 2002). Roehrig and Kruse's (2005) research shows that the beliefs of teachers play a large role in their implementation of reformed based curriculum.

Methods

A qualitative interpretive study method guided this research study. This research utilized narrative data from observations and interviews to understand how Biology teachers implement inquiry into their classes.

This study was carried out in central North Carolina in a single school system. Three teachers from two different high schools were observed and interviewed. One high school operated on a traditional 55 minute class schedule while the other operated on a 90 minute block class schedule. The three teachers in this study have a valid North Carolina teaching license, at least four years of teaching experience, and teach Biology classes.

Research was conducted in two phases. Phase one consisted of observing teachers implementing an inquiry activity in the classroom. During observations, the focus was on indentifying the distinguishing features of the activity in use. Phase two consisted of a

teacher interview. Interview questions included information about the type of inquiry activities selected, obstacles faced and strategies used in implementing the inquiry activity, and perceived success and failures of the inquiry lesson. Narrative data collected during observations and interviews was analyzed using coding to identify relationships and construct themes about inquiry implementation.

Results

Jane

Understanding of inquiry. Jane's definition of inquiry was allowing students to ask questions and find the answers for themselves. When asked to define inquiry in the Biology classroom, Jane remarked that inquiry is "activities where students are allowed to find answers by themselves and design experiments without having specific "cook book" directions." Jane said she felt "any time you can use inquiry it is better than if you do not use inquiry."

Inquiry in practice. On the day of her observation, Jane implemented a structured inquiry activity. Jane initiated the lesson by determining what the students would do during the activity. She determined the procedure for students to use. However, Jane did have the students help develop the procedure for the activity. Jane provided students with the materials – slides, cover slips, microscopes, and multiple sources of pond water – that students needed to complete the activity. There was also a specific end product that was expected from the inquiry activity.

Obstacles to implementing inquiry. Jane's inquiry understanding did not align with her inquiry practice for this particular activity. Despite her preference of high levels of inquiry, Jane was observed using a low level form of inquiry. During the interview, Jane identified two obstacles to her use of inquiry which could explain the misalignment. The first obstacle was time constraints due to the EOC. The time issue dealt with covering material for the EOC or quarter tests within a set period of time. As Jane said, "The downside of inquiry is that it takes longer." Jane would have liked to use more inquiry in her classes but said that the EOC limited the amount she used; the amount of time used was too great. The second obstacle was classroom management issues due to student's maturity. "Maturity" here seemed to deal mainly with students' lack of experience with inquiry. Jane said she dealt with maturity issues by starting out by using

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a little bit of inquiry at a time with her students. As students became more familiar with inquiry, Jane stated that she begins to add more and more inquiry into the classroom providing students with more control.

Mary

Understanding of inquiry. Mary had a definition of inquiry similar to Jane. Mary's answer to a question about the definition of inquiry was "having students ask questions and try to figure out answers." However, Mary described her typical inquiry activity as asking the students a question and giving them a procedure to follow.

Inquiry in practice. Mary's observed inquiry activity was a guided inquiry lab. She determined the research question that students would attempt to answer. The students helped the teacher develop the procedure by selecting variables and identifying which variables should be controlled. Students were provided with needed materials but also with a variety of possible materials that they could use. The results of this lab relied completely on the data that students collected and how they interpreted the data.

Obstacles to implementing inquiry. Mary's inquiry understanding, belief, and practice do not fully align. While Mary's definition of inquiry was open inquiry, she stated that she favors more structured types of inquiry for classroom use. Regardless of her understandings or beliefs, she was observed teaching a guided inquiry lesson. Mary cited time and management issues as obstacles to implementing inquiry in her classroom. Mary felt preparation for the state Biology EOC and the district quarter tests limited the time she had for inquiry. Mary dealt with the limited time by developing the investigation question and procedures for students. While Mary understood the goal of reaching open inquiry, she believed that the time constraints prevented the use of open inquiry in the classroom. The misalignment in practice could be seen as a way to reconcile Mary's understanding of inquiry and her belief about time limitations. Classroom management issues were broken down into two parts: preparing students and preparing materials. Mary said that it was important to give students some prior knowledge to help them be successful at using inquiry.

Emma

Understanding of inquiry. Emma's definition was similar to both Jane and Mary. Emma's answer to the question "How would you define inquiry in the biology

classroom?" was "students set out to solve a problem with little foreknowledge and guide themselves through the process." Emma identified this as "true" inquiry. She also stated that this type of inquiry is not often utilized in science classrooms including her own.

Inquiry in practice. On the day of Emma's observation, she carried out a structured activity more characteristic of a cookbook lab or workbook lesson than an inquiry activity. Emma determined what the students would do during the activity. She provided the students with all of the materials they would need to complete the task. Emma also determined the procedure students would use to carryout the activity. There were specific and correct answers for this activity.

Obstacles to implementing inquiry. As with Jane and Mary, Emma's understanding of inquiry did not align with her inquiry practice. Emma identified two obstacles that could explain the misalignment. First, as with both Jane and Mary, Emma cited time limitations due to standardized assessment stating that standardized assessment has taken a lot of inquiry out of the classroom. She said that to cover all the material on the EOC often forced teachers to mostly provide students with the information and not use inquiry. Emma also mentioned lack of student knowledge as a major obstacle to implementing inquiry. This lack of knowledge dealt mainly with prior use of inquiry. Like Mary, Emma expressed the importance of giving students some prior knowledge to help them be successful at using inquiry.

Discussion

The findings of this study reveal that teachers understand the goal of inquiry to be more student-centered open inquiry. In defining inquiry, participants had definitions consistent with that of Martin-Hansen's (2005) open inquiry. The findings of this study also show that despite teacher's definitions and beliefs about inquiry, obstacles prevented them from using higher levels of inquiry. Observed inquiry practices showed lower level inquiry, structured and guided, as opposed to higher level inquiry, coupled and open, being implemented. Lack of student knowledge or lack of experience with inquiry and time constraints due to standardized assessment were two major obstacles that all teachers discussed during the interview. Wallace and Kang (2004) found similar results in their interpretive multiple case study.

Two of the six participants in Wallace and Kang's (2004) study expressed the belief that students were too immature to carry out inquiry which is consistent with the views expressed by teachers in this study. One possible solution to this obstacle would be to provide students with the information needed to carry out open inquiry. The inquiry continuum can be used to scaffold student learning of the inquiry process. To ease students toward open inquiry investigations, Eick, Meadows, & Balkcom (2005) suggest starting with structured inquiry activities that meet the needs and levels of their students. Teachers can then work up the continuum giving the students progressively more freedom to gradually take on new inquiry roles and build confidence in their abilities.

Similar to Wallace and Kang's (2004) study, standardized test preparation and coverage of curriculum materials were major obstacles to inquiry implementation. Emma summed up the time requirement obstacle in her interview saying "You have to make a choice as a teacher: use inquiry to have students learn by doing or to simply give them the information"; an idea also expressed by Gejda and LaRocco (2006). The requirement of standardized assessment in classrooms results in the use of inquiry being difficult to implement (Wallace & Kang, 2004).

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Developing and Assessing Oral Proficiency in the K-12 French Classroom

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In an increasingly global society, the need for proficient speakers in foreign languages is more vital than it has ever been. Students in the 21st Century need to be able to use foreign languages in real-world communication, which requires a long period of study focused on proficiency development. To this end, foreign language instruction in grades K-12 has increasingly focused on students' oral production. This movement follows from evidence that students should be able to engage in real-world conversations, building toward more complex and extended discourse. In order to accomplish this goal, experts have found that students best learn a foreign language in a context that is relevant to their own lives (ACTFL, 2000).

Review of Literature

The American Council on the Teaching of Foreign Languages (ACTFL) defines oral proficiency as "functional speaking ability" – that is, the ability to communicate with other individuals in real-world contexts (ACTFL, 2000, p. 13). In 1996, ACTFL released the *Standards for Foreign Language Learning*, which represent the content knowledge students should possess by the time they complete an articulated program of study. According to the *Standards*, students should be able to communicate in languages other than English, demonstrate understanding of other cultures, connect their foreign language learning with other disciplines, explain comparisons between English and the target language, and participate in multilingual communities around the world (ACTFL, 1996).

While the *Standards* provide a framework around which performance-based (or proficiency-oriented) instruction can be designed, ACTFL's *Performance Guidelines for K-12 Learners* (1998) provide information allowing teachers to measure students' language proficiency as they progress through the following levels: novice, intermediate, and pre-advanced, and describe language use in three modes of communication:

interpersonal, interpretive, and presentational. Within each of the three communication modes, six domains have been included to help specify students' individual strengths and weaknesses in foreign language proficiency: comprehensibility, comprehension, language control, vocabulary use, communication strategies, and cultural awareness (ACTFL, 1998).

Some consideration must first be given to how students best learn a foreign language. Krashen's (1982) second language acquisition (SLA) theory posits that much like they acquire their first language naturally by observing those around them, young students similarly acquire a foreign language by subconsciously accumulating rules and structures (Krashen, 1982). Students can give their full attention to comprehending messages before being required to speak comprehensibly. Foreign language teachers should therefore provide comprehensible input, or meaningful communicative experiences, in the foreign language that is just slightly above a student's current level of comprehension ($i + 1$) (Krashen, 1982). The teacher can also guide students' early speech production through simple questions that allow for either/or or one-word responses and ultimately progress to fuller speech (Donato & McCormick, 1994).

Additionally, foreign language teachers should teach the language in a context, allowing language exposure to develop naturally. Context refers to a reason for communication, as opposed to contrived drills and exercises (Wong & VanPatten, 2003). Glisan (1988) believes that students should be able to perform communicative linguistic tasks in a variety of contexts in order to make meaningful statements about themselves and the world around them. Importantly, the development of oral proficiency occurs over a long period of time, and foreign language learners should ideally be given as much time as possible to build their ability in authentic situations. An early beginning with a long sequence of uninterrupted study can result in a high level of proficiency if students are given the opportunity to build language ability (Liskin-Gasparro, 1996). Therefore, students need the opportunity to comprehend language input and produce meaningful language through multiple representations and "many instances" – a variety of contexts and activities (Terrell, 1977, p. 329).

Teachers can design a variety of activities for each mode of communication to help students develop oral proficiency. In terms of the interpersonal mode, textbook

activities, group work, class discussions, role plays, and cultural simulations allow students to engage in conversations with others, exchanging information and opinions (Glisan & Drescher, 1993; Kramsch, 1986). In terms of the interpretive mode, students must be able to comprehend others' language in order to understand directions or evaluate ideas. This mode is important for building students' listening skills, which ultimately leads to increasing amounts of speech production in the foreign language. DVDs, videos, television shows, movies, music, and websites can provide a rich context of authentic language (Glisan & Drescher, 1993; Glisan & Foltz, 1998). In terms of the presentational mode, students need to be able to produce language that can be comprehended by others. Teachers might use individual or group presentations, video projects, and demonstrations to evaluate the meaning and form of students' spoken language (Glisan & Drescher, 1993).

In order to evaluate the oral proficiency of their students, teachers must be able to assess their students' target language development. Assessment refers to the gathering of information and measurement of a learner's level of knowledge (Tsou, 2005). The purpose of proficiency-oriented assessment is for students to show what they *can* do in terms of the three modes and six domains of oral proficiency. There are a variety of assessment strategies, both informal and formal, that teachers can use to help students develop proficiency. Informal assessment allows teachers to evaluate students' progress while they are engaged in a learning activity, using this information to make decisions about what to do next. Formal assessment provides similar information to teachers, but, as the term suggests, it also provides more specific feedback to students about their strengths and weaknesses in a specific area of learning and may involve the assignment of a grade. Assessment practices should align with the way in which information was presented, rooted in a real-world context, allowing students to build their interpersonal, interpretive, and presentational skills (Glisan & Foltz, 1998).

The purpose of this study was to investigate instructional strategies used by French teachers to develop students' oral proficiency and the formal and informal assessment strategies used to evaluate students' progress.

Methodology

The study involved three elementary school, three middle school, and five high school French teachers in a public school district located in central North Carolina. Data were collected between September and November, 2008. The subjects were selected through recommendations from the advisor and the teachers' willingness to participate. First, the researcher interviewed the eleven French teachers using a researcher-designed interview instrument, focusing on instructional and assessment methods relevant to oral proficiency development. Second, the researcher observed one class of six randomly chosen teachers from the original sample to see instructional methods and assessment tools in action. Responses and observation notes were analyzed in order to determine the major types of activities and assessment strategies relevant to the study.

Results

The information collected during the interviews and observations was analyzed in terms of how teachers develop and assess students' oral proficiency. It is important to note the limited sample of this study and that each teacher was observed for only one class period. Therefore, the researcher cannot claim to make broad generalizations about the status of oral proficiency development and assessment.

Most teachers stated that oral proficiency is best defined as the ability to communicate with other individuals in real-world contexts. Some teachers noted, however, that certain factors might be inhibiting students' progress including lack of interest, shortened attention spans, and unwillingness to take responsibility. Teachers gave inconsistent answers about the school district's expectations for oral proficiency, suggesting that this information is not clearly conveyed to them, that specific expectations do not exist, or that there is a lack of cohesion in the district. Many teachers noted a lack of administrative support, which in their view detracts from oral proficiency development. On the other hand, several teachers seemed optimistic about the subject, mentioning that they are expected to link French with other subjects. In addition, many teachers described the overall language ability of their students as "good" or better and said they are satisfied with students' progress as they move through the French program.

The majority of teachers expressed familiarity with ACTFL's *Performance Guidelines for K-12 Learners*, and most reported using them to either design instruction

or modify existing lesson plans using the three modes of communication. Several teachers mentioned the novice, intermediate, and pre-advanced levels. None explicitly mentioned the six domains of communication, though most teachers' responses suggested they consider some or all of these domains in designing and modifying their instruction.

Teachers reported using a wide range of activities relating to the interpersonal, interpretive, and presentational modes of communication. Teachers who said they used the *Guidelines* to design their instruction reported using a wider variety of activities than did teachers who used them to modify their existing lesson plans. Information gleaned from the observations suggested a heavy reliance on textbook activities for all three modes of communication at the middle and high school levels.

Teachers' responses about the importance of the six domains of communication in their classrooms revealed that teachers consider comprehensibility and comprehension to be most important. Overall, language control was considered by teachers to be the least important domain, though it should be noted that all six were rated as at least "somewhat important" by all teachers. Results suggested that although some teachers may not be aware of specifics of the *Guidelines*, they still believe its components are important.

Elementary school teachers reported using the most French in the classroom, while high school teachers reported the most use of French by students, consistent with theories of second language acquisition and comprehensible input. Observation results corroborated teachers' answers, though it was observed that teachers slightly underestimated the use of French by students and overestimated their own use of French.

The researcher found that teachers rely on informal methods of assessing oral proficiency much more heavily than formal ones. Several teachers mentioned that speaking ability is the hardest aspect of language to evaluate because a great deal of time must be devoted to individual students, making formal assessment more difficult. The observations revealed use of formal assessment through a rubric in only one classroom. Informal assessment was, however, observed to be used in each teacher's classroom.

Only one teacher indicated that her students are more proficient in speaking than in listening, reading, or writing. While all four are equally critical in the French classroom, such a finding indicates a need for a greater emphasis on and more effective strategies to promote oral language development.

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Conclusion

As stated in the review of literature, oral proficiency refers to students' ability to communicate with other individuals in a variety of authentic contexts; it is best developed through authentic activities that promote use of the three modes of communication. Furthermore, foreign language learners benefit from "many instances" of language concepts that afford them multiple opportunities to practice using the language. Indeed, our global society demands foreign language speakers who are able to communicate with others. This study shows that both teachers and the school district are aware of the challenges and opportunities that accompany a global society and that they are making great efforts to help their students achieve proficiency. First-rate foreign language teachers are critical to helping today's students succeed in using language for authentic purposes in an increasingly diverse population. It is essential to support them by recognizing their unique importance and talents and by providing them with the information and training necessary to help every student succeed.

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Teacher Actions and Student Enthusiasm

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All teachers know the difficulty of trying to motivate their students to learn. So how much can a teacher affect a student's enthusiasm, and thus willingness to learn? Patrick, Hisley, and Kemplar (2000) found that when a teacher exhibits greater evidence of enthusiasm, students are more likely to be interested, energetic, curious, and excited about learning. Further studies have shown that teachers can have a major impact on "the students' willingness to make initial and persistent efforts in our classes" (Sass, 1989, p. 87). Sass (1989) asked groups of college students what motivated them most to do well, and overwhelmingly their response was teacher enthusiasm. Heller (1996) found similar results: "personal enthusiasm [is] the most important variable affecting student motivation" (Heller, 1996). Young, Whitley, and Helton (1998) also found teacher enthusiasm to be the most influential marker for student engagement. Of their surveyed high school and college students, over 80% replied that teacher enthusiasm was Very Important or Important on a Lickert Scale (1998).

So if the trick for keeping students motivated is teacher enthusiasm, what kinds of actions can teachers utilize to demonstrate their enthusiasm? Better still, what responses do students give to certain teacher actions? Young et al. (1998) found that humor, instructor movement and gesturing, and teacher knowledge were valued most highly valued by the students. Wild, Enzle, & Hawkins (1992) showed that students were more intrinsically motivated if they perceived their teacher as volunteering to teach them versus being paid to teach them. Patrick et al. (2000) sought to further quantify this idea by artificially manipulating teacher enthusiasm, finding that lessons delivered in "a high-energy, dynamic fashion," utilizing demonstrative gesturing; vocal delivery with

variation in pace, volume, and intonation; varied dramatic movements; and facial expression and emotion, lead to increased enthusiasm in the student toward the material.

Research Question

How do teachers' actions influence student enthusiasm?

Methodology

Subjects

We studied four high school classes, led by four different teachers (coded A, B, C, and D), in Forsyth County, NC.

Measures/Procedures

Observing live classrooms provided an accurate look at what types of actions different teachers performed throughout the class periods, taken at measured intervals. Further observation was to determine the effectiveness (or ineffectiveness) of the different actions on the students. A structured observation of actions and reactions was done with a modified Flanders Interaction Analysis. As such, field notes were the major device of measurement. Attached is a sample of the form used for data collection.

Analysis

The teachers' actions were analyzed at 5 minute intervals during the 48-minute classes and coded using the following categories:

- Praises, encourages, or jokes
- Accepts or uses student ideas
- Asks questions/Awaits response
- Lectures/Writes on board
- Gives an assignment or directions
- Criticizes or reprimands
- One-on-one instruction
- Uses technology
- Supervises class/work

Five (5) student reactions were also observed and coded immediately following the teachers' actions at every interval. Three students were chosen purposefully (1 attentive student, 1 inattentive student, 1 average student) and two randomly in each class. The 3 "purposeful" students were selected from their apparent interest in the first observational period (5 minutes of class), though these labels were not tracked through recording and were not always accurate. The goal was simply to try and observe students that initially showed differing interest levels in each class. At each time marker, the students were then coded as being either Enthusiastic or Uninterested. The categories were generally defined as follows, though these lists were not all-inclusive:

Enthusiastic

- Making eye contact with teacher
- Leaning forward
- Asking or answering questions
- Actively participating in class
- Eagerly taking class notes
- Working on an (assigned) assignment

Uninterested

- Sleeping or head down on desk
- Staring into space and/or yawning
- Texting or other use of cell phones/toys/games
- Playing with hair or clothes
- Chatting, flirting, or passing notes
- Drawing/doodling
- Moving around the room or being disruptive

The overall "feel" of the class was also coded at each prescribed time, after the students and using the same system. Therefore, at each interval, the researcher counted the number of students in the class that were off-task or uninterested and record that number, as a "snapshot" of the class's overall enthusiasm at that time. This was to see if the trends of the 5 specific students observed mirrored or differed from the class as a

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whole. Essentially, we used the class-as-whole as the control by which we measured the accuracy of the specific 5 students' observations.
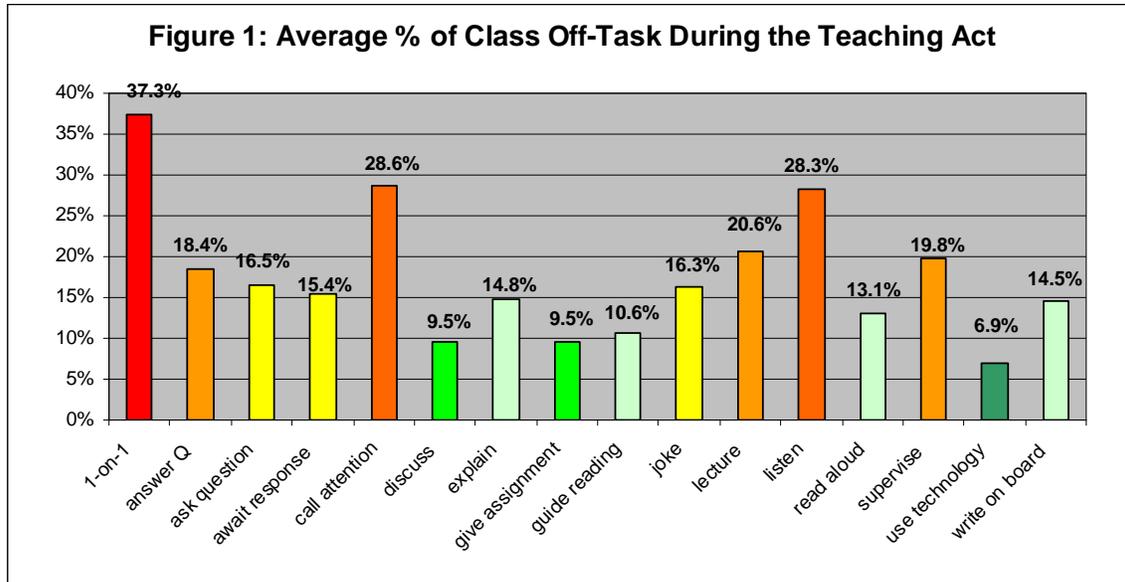
Results

After analyzing the data collected, several trends emerged with relation to student off-task or uninterested behavior and certain teaching acts. **Table 1** contains the data regarding relationships between the specific teaching acts observed and the average percentage of the class that was off-task across the spectrum of those observations. The table also records the number of observed occurrences of each teaching act. As some of the occurrences are substantially lower than others, there is easily room for further investigation, but even with limited observations relative trends for certain acts were apparent. **Figure 1**, below, visually demonstrates these trends more easily.

Table 1:

TeachAct	#observed	avg % off
1-on-1	32	37.34%
answer Q	21	18.43%
ask question	46	16.54%
await response	7	15.43%
call attention	5	28.60%
discuss	2	9.50%
explain	8	14.75%
give assignment	15	9.47%
guide reading	17	10.65%
joke	4	16.25%
lecture	16	20.63%
listen	3	28.33%
read aloud	7	13.14%
supervise	16	19.81%
use technology	7	6.86%
write on board	2	14.50%

The acts with the highest level of enthusiasm, those with the lowest average percentage off-task, were when the teachers used technology, gave an assignment, or participated in open discussions with the class. Of these, using technology is shown to have the lowest levels of off-task behavior or disinterest from the students (averaging only 6.8%). The acts involved in questioning (asking, answering, and awaiting response), while some of the most common, were only average in terms of student enthusiasm. In fact, asking a question was the single most common act (n=46) but yielded an average disinterest level of 16.54%. The next most common teaching act was one-on-one instruction (n=32), which resulted in the highest disinterest level by a sizeable margin, 37.34%.

Figure 1: Average % of Class Off-Task During the Teaching Act

Guiding reading, writing on the board, and explaining instructions resulted in relatively high student enthusiasm, with only 10.65%, 14.5%, and 14.75% uninterested respectively.

Conclusions

An interesting finding from the data analysis reinforces a belief we had entering this research: the more involved in the learning process the student is, the more engaged and enthusiastic they will likely be. Acts like guiding class reading, giving assignments, having open discussion with the class, and explaining complex points brought out more student enthusiasm than less-interactive acts. Supervising classes at work, listening to student replies, and lecturing saw some of the lowest engagement levels in students. The more involved the interaction between students and teacher, it seems, the better.

But there is a balancing point. Teachers that spend too much time focusing on one-on-one interactions may be sacrificing the enthusiasm of the rest of the class. One-on-one interaction showed by far the largest levels of disinterest and disengagement among students. In a few cases, literally *every student* observed during a one-on-one other than the targeted student was off-task or uninterested. This is troubling, since one-on-one interaction is an outstanding way of reaching and helping individual students.

As always, there are concerns about the validity of these results. At times it was difficult to accurately measure whether students were truly engaged or merely "faking it," which might have lead to some false positives. Also of concern are compounding factors, which is to suggest that the teaching acts alone are not the only basis of student enthusiasm at any particular time. Time of day, personal and social issues, or any number of other factors might influence or distract students and thus affect the results.

If anything, the research process and resulting conclusions brought to the forefront the need for further exploration in this area. Expanding the scope of the research to include either more teachers, thus seeing if the trends continue across other educators, or more students observed, providing more reliability in representing a class-wide scale, would be tremendously useful. Similarly, while there were many observations made in the 40 hours of observation, more observations would be preferable to reduce uncertainty and statistical error from smaller sample sizes.

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Students Experience SMART Board through Constructivist Values

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The use of SMART Board technologies as an interactive tool in the field of education is grounded by constructivist theory. A constructivist learning environment is a setting where learners collaborate and support one another using a variety of tools and information resources in the guided pursuit of learning goals and problem solving activities (Rainer, Guyton, & Bowen, 2000). According to Lebow (1995) there are several values that represent a strategy for summarizing the constructivist framework: active engagement, collaboration, community, personal autonomy, reflectivity, and pluralism. Constructivist values are present in student centered classrooms. According to Isman, Yaratan, & Caner (2007) SMART Boards are essential to science classrooms because SMART Boards bridge the gap between science content and technology, and foster active and engaging learning in the classroom. Rochette (2007) believes that SMART Board is a tool that extends the horizons of teaching and learning. However, there is limited research on the use of SMART Board technology in the classroom and more specifically the effect of SMART Board on constructivist theory approaches. Therefore, the purpose of this study is to explore high school students' science classroom experiences with SMART Board instruction. This study intends to help instructors better understand how SMART Board can enhance student engagement levels and cognitive skills. This research attempts to answer the question: How do students experience learning from SmartBoard technology by teachers using a converted PowerPoint lesson?
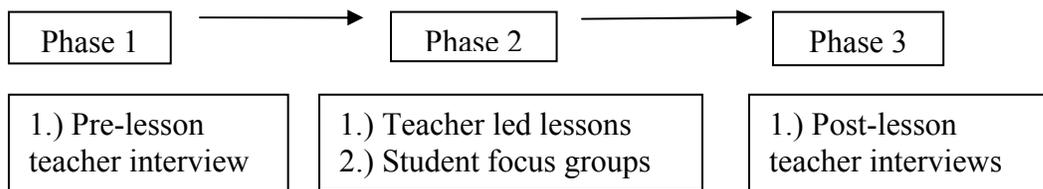
Methods

This study is based on the qualitative interpretive case study model and was conducted in a central North Carolina high school. Participants for this study included one veteran Biology teacher, one experienced Physics teacher, and students from two of

their classes. Students in this study represent diverse backgrounds that can be found at most high schools.

This research study consisted of three phases. The first phase consisted of teacher pre-lesson interviews and teacher training sessions with the researcher to learn how to convert PowerPoint to SmartBoard. In the second phase the participating teachers lead lessons and the researcher carefully collected data on engagement through participant observation. Classes were observed through a classroom observation scale protocol. Additionally, focus groups with participating students were held at the school. Lastly, the third phase consisted of post-interviews with participating teachers. Research activities are illustrated in Figure 1.

Figure 1: Research process.

Phase 1	→	Phase 2	→	Phase 3
1.) Pre-lesson teacher interview		1.) Teacher led lessons 2.) Student focus groups		1.) Post-lesson teacher interviews

This observation protocol examined four aspects of the research question: learning activities, engagement levels, cognitive thinking levels, and learning directors. Learning activities were scored using the observation protocol scoring chart. Engagement was measured by the percentage of attentive, on task and responsive students. Cognitive levels were calculated by observing the level or order of thinking occurring, using Bloom's taxonomy. Learning direction was determined by evaluating who directed learning in the classroom, teacher or student.

Results

Engagement. The classroom observation scale protocol revealed that at least eighty percent of students were actively engaged for the entirety of the lessons. This was determined by observing students' attentive, on task, and responsive behavior every five minutes throughout the lesson. During observations, students remained attentive to the teacher and the student at the board. In the physics classroom students sat attentively and most were totally focused on the student at the board. In a sign of attentiveness, some students moved forward in their chairs to see what other students were writing. Students

indicated their high level of engagement during the lesson was due to the interactive properties of SMART Board. In a biology classes' focus group interview a student responded that they "felt engaged, and the lesson was interactive and I felt apart of the lesson." Another student suggested that novelty played a roll in her engagement stating "you were not use to it (SMART Board), but it helped you remember it." Some students commented how the interactive features of SMART Board engaged them. Students commented: "The lesson was more interactive. People sometimes slack off in PowerPoint, but with SMART Board it is more interactive, and draws people in."

Learning activities. Six main learning activities occurred during the SMART Board lesson: class discussion, student presentation, lecture with discussion, technology – student use, questioning by the teacher and student response (see figure 2).

Figure 2: Classroom Learning Activities. Each graph represents a full lesson. Every five minutes the classroom activities were scored. On the left are biology classes, and right are physics classes.
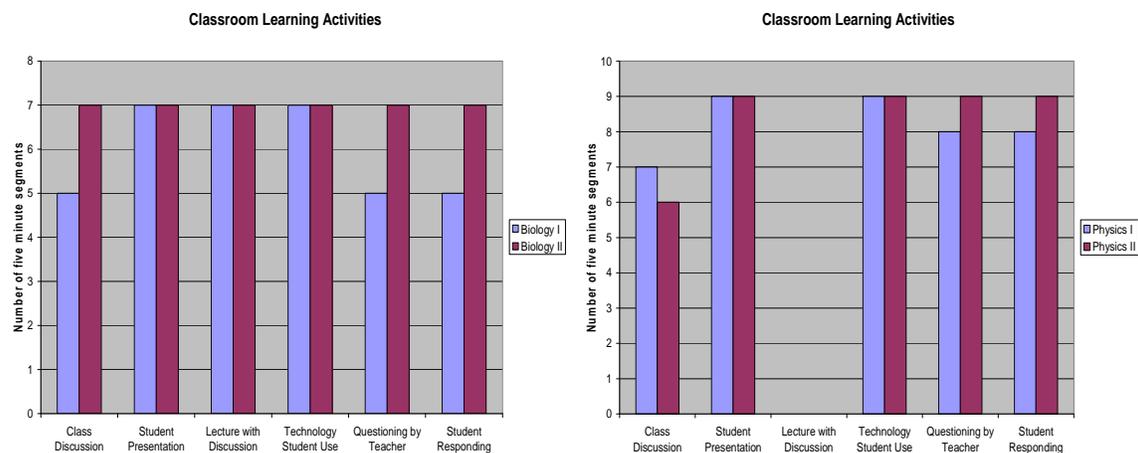
Learning director. Both biology and physics classes began with the teacher directing most of the learning at level two, however, as each lesson progressed the learning director gradually moved from level two to level four. In this case the learning direction progressed from being mostly teacher directed to mostly student directed within fifteen minutes of starting the lesson (see figure 3). By the end of each class students presented much of the material and read aloud their answers. Students also noticed the shift in learning direction. Students responded that the main difference between PowerPoint and SMART Board in the biology class was: "In SMART Board we wrote our own notes, and filled in the blanks, and focused more on the concepts than just writing notes. The teacher had to wait on us before she could go to the next slide, in

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PowerPoint we are just trying to keep up with her." During physics lessons, students were seen presenting the material and the teacher acting as a facilitator of the lesson. Another common theme throughout the focus group interviews was a sense of ownership in the lesson. "With SMART Board it was more interesting, you can't write on PowerPoints, but with SMART Boards you could put in your two cents worth."

Figure 3: Learning directors in the classroom. The scale ranges from zero to five. The zero point represents total teacher control of the classroom. Five represents total student control of learning. Three is an equal combination of student and teacher control of learning.
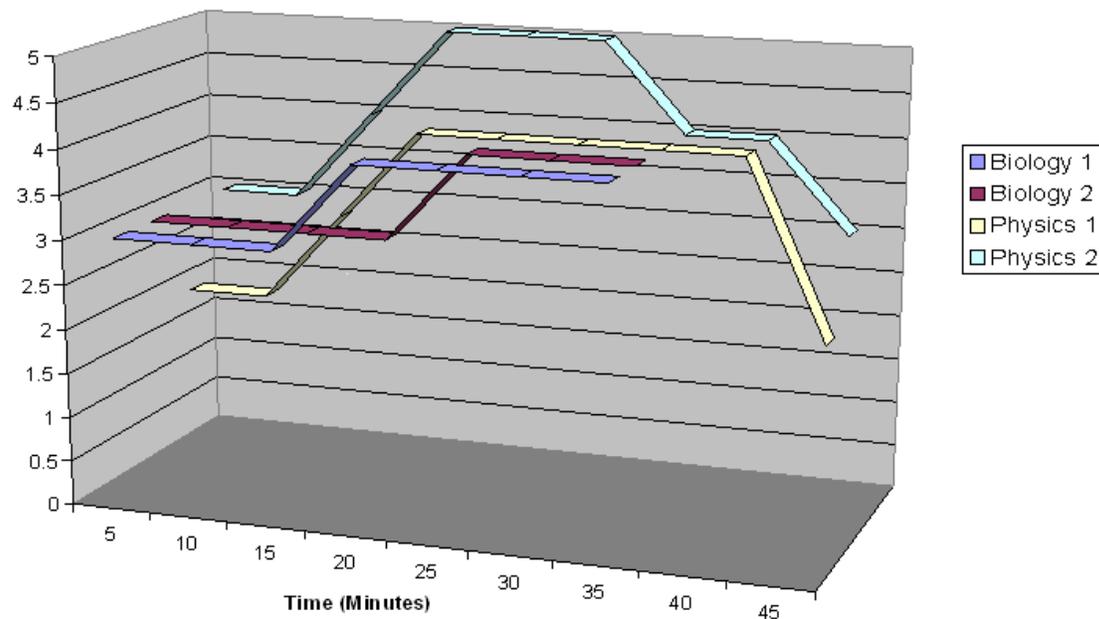
Cognitive activity. Higher levels of conceptual understanding, beyond remembering and understanding on Bloom's taxonomy levels (see figure 4), were incorporated during the SMART Board lessons. Throughout the lessons students were observed answering questions that suggest high level thinking orders, such as creating and applying concepts. However, in both physics and biology classes higher order questioning and thinking occurred later in the lesson. After the SMART Board lesson, the Biology teacher responded that, "students seemed to understand the information from what I gathered from my assessment, so I would say they have a higher level understanding of the information." Students also identified their conceptualization during the focus group interviews: "When we take notes from PowerPoint there are just a bunch of bullets, and we just scan for information, but SMART Board makes you think about what you write."

Figure 4: Cognitive Activity. A score of one represents no evidence of the cognitive skill. A score of two represents evidence of the cognitive level. A score of three represents an excellent representation of the cognitive level.

Biology 1	0-5 mins	5-10 mins	10-15 mins	15-20 mins	20-25 mins	25-30 mins	30-35 mins
Remember	2	2	1	2	1	1	1
Understand	2	2	2	2	1	2	1
Apply	1	1	2	1	2	2	3
Analyze	1	1	1	1	2	2	3
Evaluate	1	1	1	1	2	2	3
Create	1	1	1	1	2	1	3

Biology 2	0-5 mins	5-10 mins	10-15 mins	15-20 mins	20-25 mins	25-30 mins	30-35 mins
Remember	2	2	2	2	1	1	1
Understand	2	2	2	2	1	2	1
Apply	1	1	1	1	3	2	2
Analyze	1	1	1	1	3	2	3
Evaluate	1	1	1	1	2	3	3
Create	1	1	1	1	2	1	3

Physics 1	0-5 mins	5-10 mins	10-15 mins	15-20 mins	20-25 mins	25-30 mins	30-35 mins	35-40mins	40-45 mins
Remember	2	2	1	1	1	1	1	1	1
Understand	2	2	2	2	2	1	1	1	1
Apply	1	1	2	2	2	2	2	2	2
Analyze	1	1	2	2	2	2	2	2	2
Evaluate	1	1	1	1	2	2	1	1	3
Create	1	1	1	1	1	1	1	1	3

Physics 2	0-5 mins	5-10 mins	10-15 mins	15-20 mins	20-25 mins	25-30 mins	30-35 mins	35-40mins	40-45 mins
Remember	2	2	1	1	1	1	1	1	1
Understand	2	2	1	2	2	1	1	1	1
Apply	1	1	2	2	2	2	1	2	2
Analyze	1	1	2	2	2	2	2	2	3
Evaluate	1	1	1	1	2	2	1	1	3
Create	1	1	1	1	1	1	1	1	2

Challenges. At the conclusion of observations an additional theme became evident. Novelty seems to be a factor in the use of SMART Board. Students in both classes appeared hesitant to interact with the board; however, after the student realized how to use the board they were much more comfortable. When students were asked about how easy they found SMART Board was to use they responded: "It took me a minute to get the hang of it." But after trying it out they, "felt comfortable after the first time."

Discussion

The findings of this study reveal that students experience a constructivist environment when learning through SmartBoard technology. Particularly, SMART Board activities provide students with opportunities to collaborate, build community, reflect, stay actively engaged, value different perspectives, and take ownership over learning.

SMART Board fosters shifts in learning directors from teacher centered to student centered classroom environments. These shifts in learner direction are likely explained by students' acknowledgement of personal autonomy with the lesson. SMART Board activities allowed students to dictate the speed of the lesson giving them personal autonomy over the lesson. Therefore, a correlation between learning direction and personal autonomy is evident. The correlation suggests that as the learning director shifts on the continuum from teacher driven to student driven; students' personal autonomy is increased. In this way SMART Board aligns well with constructivist framework, allowing for strong student personal autonomy and student centered classroom environments.

Use of SMART Board enhanced collaboration by fostering a constructivist learning community. Through an essential question, displayed on the board as a group goal, SMART Board provided a tool for fostering a community environment as students worked together. Additionally, SMART Board fostered student to student discourse which aided in the formation of collaborative learning communities in each classroom.

Students experienced high active engagement during SMART Board lessons. Instructional techniques, such as student interaction, student to student discourse and the use of technology all played significant roles in high student engagement.

An examination of students' experience with SMART Board after multiple uses would compare whether SMART Board or novel technologies stimulate students.

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Students' Understanding of Linear Regression

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In 2000 the NCTM published the *Principles and Standards for School Mathematics,* which restated the earlier belief that students must learn mathematics with understanding, actively building new knowledge from experience and previous knowledge. Therefore, the incorporation of teaching and learning with understanding has been a leading part of the education reform (Prawat, R., Remillard, J., Putnam, R.T. & Heaton, R.M., 1992).

Literature Review

Traditional mathematics education has emphasized procedures and rote memorization, and often lacked conceptual understanding. Schoenfeld (1985) showed that traditional mathematics education created successful students who were good at memorizing and following rules, and that rules were used as reason for action, without recognizing why the rule works. Later research studies have shown that the consistent and frequent use of instructional practices related to process and content standards positively affects student achievement on standardized tests in standards-based mathematics curriculum (McCaffrey, Hamilton, Stecher, Klein, Bugliari, & Robyn, 2001; Spillane & Zeuli, 1999; Turner, 1999). In direct contradiction to those results, Gimbert, Bol and Wallace (2007) observed that the higher use of national standards in mathematics teaching was associated with lower student achievement, and that the lower achievement in high standards based classrooms describes a form of lower level of understanding. Sajka (2000) studied understanding of the concept of function with different representations of function, and found that understanding was limited to a combination of formula and graph.

Mathematical modeling is a topic which has a high reliance on using technology, and includes the subject of lines of best fit. In research carried out by Maull and Berry (2000), the use of technology demonstrated students' ability to apply procedural

knowledge to create a regression, without any regard to the conceptual understanding of their action. Lingefjard (2002) observed that common errors of solving modeling problems can involve necessary knowledge, reasoning and logic skills, and the student's experience.

Research has shown that traditional mathematics instruction has limited a learner's ability to gain conceptual understanding and that results for standards-based reform instruction contradicted the levels of improved understanding. It also demonstrated different levels of students' current procedural and conceptual knowledge, particularly in the understanding of functions which are used in mathematical modeling. Research further supported that modeling had a vast amount of possible errors and its high level of technology dependence suggests that modeling is an area of mathematics that might lack conceptual understanding by learners. Therefore, linear regression would appear to be dominated by more procedural than conceptual knowledge in its relation to functions and modeling. Thus, this current study will explore how learners are gaining a procedural level of knowledge and conceptual understanding in the mathematical subject of linear regression.

Methodology

This study was conducted using a qualitative method. It was designed with the intention of focusing on a student's current procedural level of knowledge and conceptual understanding of linear regression (often called line of best fit). Seven students enrolled in an Advanced Functions and Modeling course taught by the same teacher from a single high school in a school district in North Carolina agreed to participate in the study.

Assessment interviews were the methodology of this study. The initial questions asked the student to identify their mathematical background. The primary task involved asking the student to talk aloud as they used a data set to solve for a line of best fit and predict values. The task was adapted from a sample NC End of Course Exam in Algebra I. Supplementary questions gauged the student's comprehension of each task and a broad application of this knowledge. The interview was audio-recorded and students were required to talk aloud through their procedures and reasoning as much as possible. The interview occurred on site at high school's conference room during their lunch period under the supervision of the student's teacher. The audio-recording was analyzed using

coding for conceptual and procedural knowledge with specific interest in student's logic of explanations. The accuracy of answers was analyzed based on student's solution method.

Results and Discussion

Mathematical Background

The math courses that the 7 students have taken while in high course are presented in Figure 1 with all students having completed Algebra II. Three out of the seven students had completed their Algebra I course while not in high school. The importance of the Algebra I and Algebra II completion by all students is that line of best fit with linear models is part of the Standard Course of Study for both courses (NC Department of Public Instruction, 2003a, 2003b). Therefore, linear regression had previously been introduced before their current class. A final observation was that 3 of the 7 students had already completed 3 different math courses.

Figure 1: High School Mathematics Background
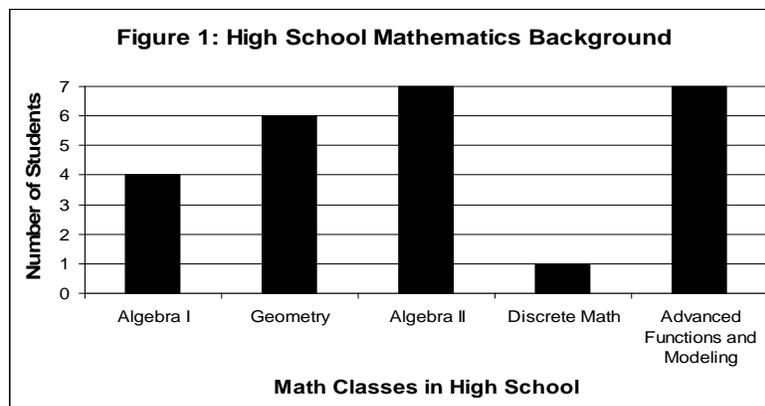
Line of Best Fit Solutions

The primary two tasks that the students performed were based around using data of hours studied and test scores for a fictitious class. Task Number One asked "*according to a line of best fit for the data, what is the predicted test score of a student who studied 1 hour for the test? (with calculator)*" and Task Number Two asked "*if a 70 is passing, then how many hours would you predict a student needed to study to pass the test?*". The answers of the students were coded by correct, no answer, incorrect, or correct by coincidence (Figure 2). The term "correct by coincidence" referred to the use of the Median-Median line which was a close approximation that gave the correct solution. Generally, success on Task Number One implied success on Task Number Two.

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Figure 2: Student Answers to Interview Tasks
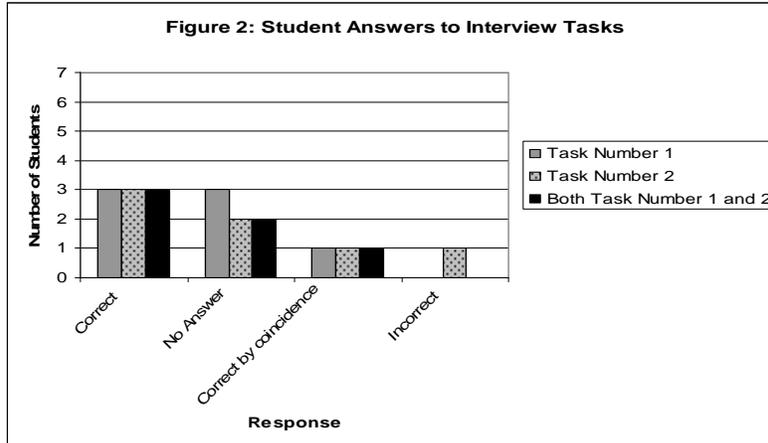
Regression Knowledge

As part of the assessment interview, students were asked supplemental questions about their general knowledge for line of best fit. Responses about the meaning of the line of best fit varied. Three student responses were able to mention in some way that it would relate to a set of data, but not specifically how that relation occurred. The remaining four student responses were able to give an explanation of how this relation occurs, but none of those four responses give the exact definition of the line of best fit. All of these responses have a rather large gap in mathematical content or calculation in how the line of best fit relates to the data and show only a surface level of knowledge about it. Additionally, the students were asked about the properties of a line of best fit including whether any of the data points would have to be on the line of best fit. The other question about the line of best fit was if there were any other lines that might work to fit the data. Figure 3 show students hadn't completely grasped all the properties of a line of best fit because half of the students answered both questions incorrectly.


Figure 3: Properties of Line of Best Fit
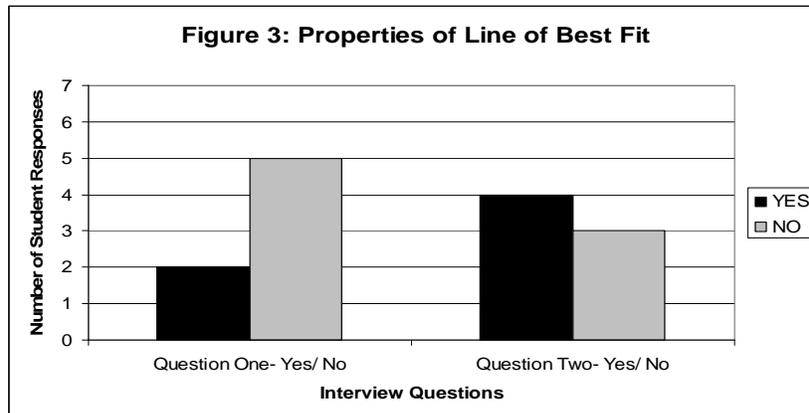
Representation Analysis

A general trend of student responses to the primary tasks suggested that the students didn't recognize that the line of best fit also represented an equation when presented with the formula of y = ax +b from the LinReg command. Students were asked to identify what each symbol represented in the formula in terms of the data. One student misidentified the x and y as test scores and hours studied and another student could not even identify them. Furthermore, only three students defined the slope (a) in terms of relating a rise of hours studied to test scores rising. For the y-intercept term (b), only three could relate it to the test score for zero studying. Students' symbol representation was definitely lacking in a few cases which extremely hindered their ability to use a line of best fit to predict values.

Technology

Every student was initially proficient at stating the necessary procedures to perform a linear regression with their calculator, but several were not able to recall the appropriate procedures to finish their solution method (See Figure 4). Interestingly, only Student #4 who performed the Median-Median Line did not use the same steps.

Figure 4: Technology Procedures Task Number One
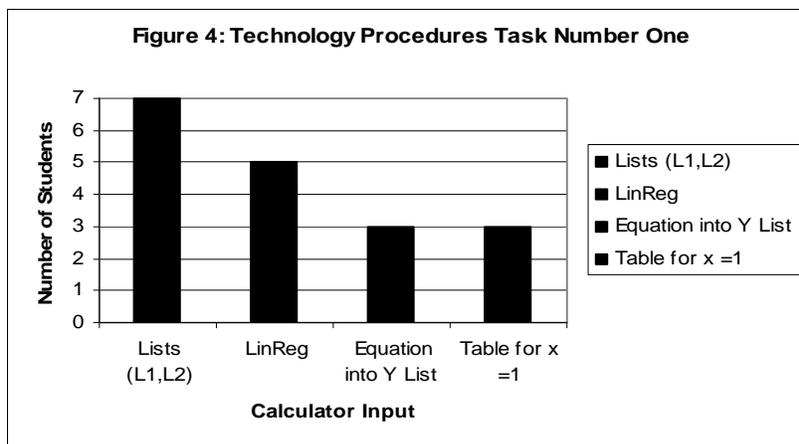
For describing the process of the calculator to calculate the line of best fit two students offered no explanation. Four students assumed it somehow plotted points without discussing any mathematical calculation. Student #7 used the most mathematical explanation that it was taking different data points to get the slopes of the line connecting these points. The students showed a lack of ability to calculate a line of best fit by hand and relied on the computing power of the calculator.

Conclusions

The students in this study had the procedural skills necessary to create and solve for a line of best fit. However, most often the students were highly dependent on the knowledge of a set of calculator procedures so that when a student was unable to recall them, then the student failed. The students' missing conceptual understanding would have helped them overcome the lack of technological recall. The students possessed no understanding of a line of best fit as an equation that could be algebraically solved. Rather than the equation representation of this line, students followed the graphical representation. This representation limited their ability to predict values. Although some students completed the primary tasks with procedural knowledge, no student could demonstrate a detailed knowledge of all aspects of the line of best fit to show a complete conceptual understanding of the subject. Therefore, it is the conclusion of this study that the students still were not learning with understanding in the area of linear regression as prescribed by the NCTM (2000).

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The Effect of Teacher Question Type on Student Engagement: A Study of High School Classrooms at Four Ability Levels

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Teacher efforts to lead students to cognitive development and knowledge should be viewed as a necessarily deliberate act, facilitated in large part by the questions teachers use. By continually assessing student ability and offering challenging instruction in a discursive environment, teachers encourage student growth. It is in the students' responses to these questions that cognitive development can occur. Student engagement is a central component to a student's potential for cognitive development in the classroom environment: "[Student engagement reflects] the student's psychological investment in and effort toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote" (Newmann, 1992, p. 12). Available literature makes clear the importance of a teacher's questioning technique in a student's growth. This study evaluated how teachers utilized question types in four class levels of varying ability and how those questions affected student engagement.

Review of Literature

"In countless situations in the English classroom, questioning is undoubtedly a favored – and often most effective – teaching and learning tool" (Christenbury & Kelly, 1983). Hierarchies are a useful tool to determine a teacher's objectives for cognitive development of their students. The taxonomy was recently tailored to facilitate its use as a tool for, among other needs, "instructional delivery and assessment" (Forehand, 2005). Teachers must be sensitive to student engagement while questioning a class, due to engagement's central importance to cognitive development as well as for the environment of expectations that questions create (Anderson et al., 2001; Feldman & Prohaska, 1979; Nystrand & Gamoran, 1990).

Methodology

Subjects

Four English teachers and their classes in a Winston-Salem/Forsyth County High School were observed during Fall semester, 2008. Between the four teachers, four different levels of English classes were taught and observed: Advanced Placement, Honors, Standard, and Remedial English. All classes ranged in size from 10 to 30 students and represented all four high school grades. Each class level was observed seven times for a total of 28 observations.

Measures

Field notes were recorded concerning the questions asked by the teacher and corresponding levels of student engagement. The teacher act of questioning was noted using the Revised Bloom's Taxonomy of the Cognitive Domain (Anderson et al., 2001) according to what level of response the teacher appeared to seek. By analyzing the syntax of the question and the context the question was asked in, an otherwise subjective assessment of teacher's intent became more reliable. The Revised Taxonomy of objectives is hierarchical moving from lower- to higher-order questions. This research classified Remember, Understand, and Apply as lower-order questions, and Analyze, Evaluate, and Create as higher-order questions. Student engagement was codified as engaged or disengaged. A non-participant observer recorded and sequenced data continuously for question type (capturing every question asked by the teacher) and at five minute intervals for student engagement (nine data points per class period) throughout the 50 minute class periods.

Analysis

Total questions asked, and averages of question types asked were compared between the four class levels. Overall student engagement was assessed for each of the four class levels based on the composite of student engagement for each class. Individual class data sets were chosen from the 28 total data sets and matched with supporting field notes as representative of the trends observed. For each class observed engagement versus question type was assessed by analyzing the trends of the nine, five minute intervals. The trends were compared to the class's engagement during that same interval. To capture a comprehensive view of how teachers utilized different levels of questions,

one analysis addressed all six levels of question type (Remember through Create) to compare across the four class levels. In order to gauge questioning strategy when trending the conduct of a specific class, or data set, the variable "percentage of higher-order questions asked" was used instead of the more granular measurement of the six types of questions in the Revised Bloom's Taxonomy. An overall assessment of higher- versus lower-order questions asked was also conducted to aid in consideration of the patterns that emerged for the four levels.
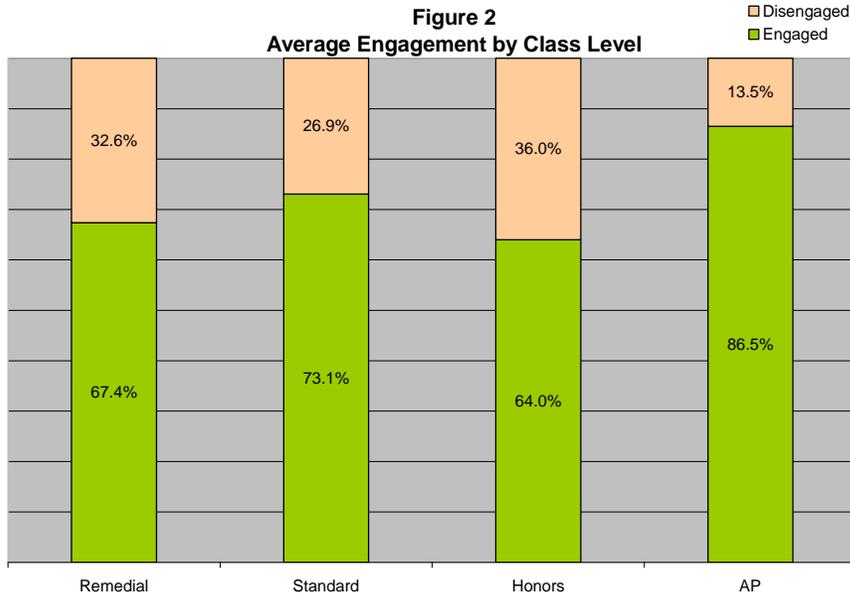
Results and Implications

The average of the total number of questions asked by teachers per class increased according to class level, as did the percentage of higher-order questions (see Figure 1).

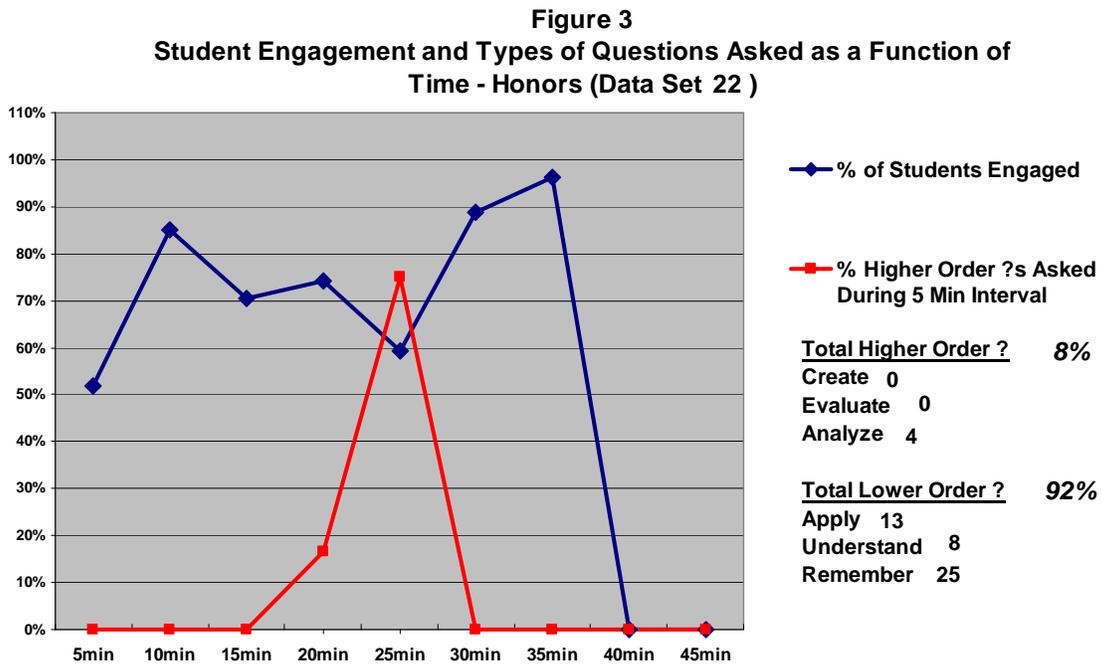**Figure 1**
Average Questions Asked per Class Period by Level
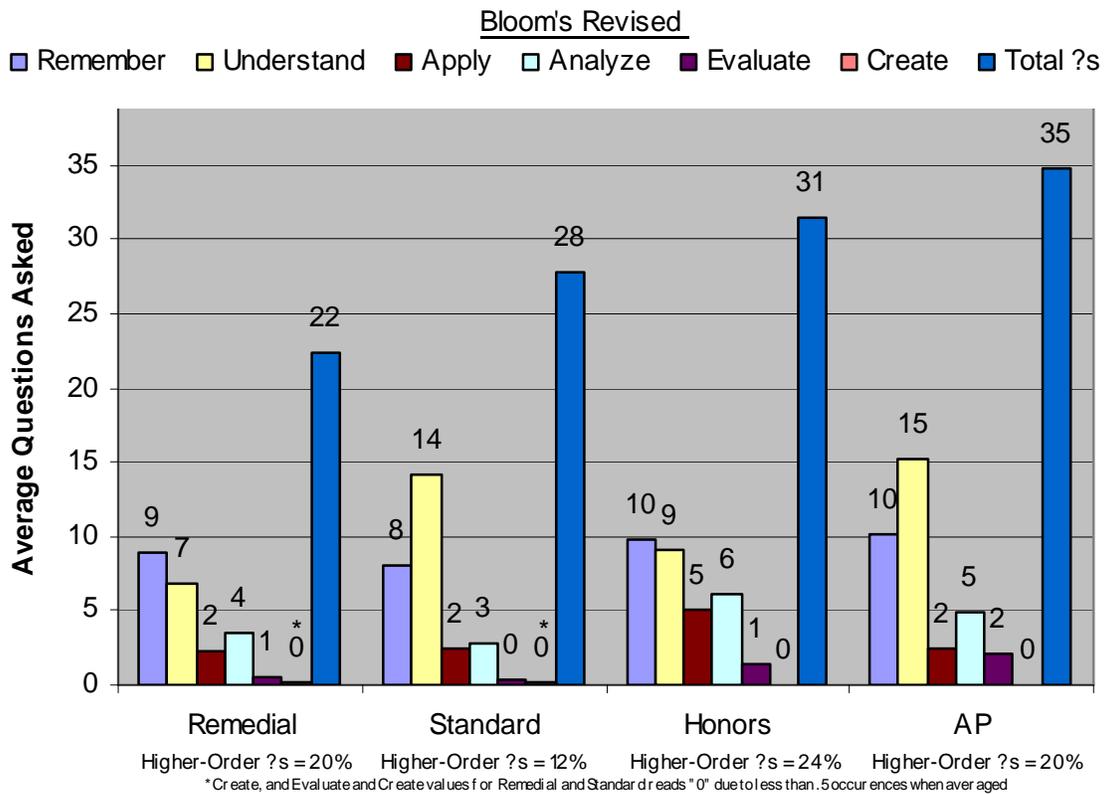
Regardless of class level, this research found a disproportionate number of lower-order questions (see Figure 1). Student engagement also increased by class level (see Figure 2).

Figure 2
Average Engagement by Class Level

Legend: ☐ Disengaged ☐ Engaged

Class Level	Disengaged	Engaged
Remedial	32.6%	67.4%
Standard	26.9%	73.1%
Honors	36.0%	64.0%
AP	13.5%	86.5%

Trending using basic, descriptive statistics implied a relationship between the type of question a teacher asked and the resultant engagement of the class. Student engagement increased as teachers asked higher-order questions. Student engagement

Figure 3
Student Engagement and Types of Questions Asked as a Function of Time - Honors (Data Set 22)

Legend:
◆ % of Students Engaged
■ % Higher Order ?s Asked During 5 Min Interval

Total Higher Order ?   **8%**
Create 0
Evaluate   0
Analyze   4

Total Lower Order ?   **92%**
Apply   13
Understand   8
Remember   25

decreased as teachers asked lower-order questions. This trend appeared across all class levels. In the example provided in Figure 3 a typical lag between the change in the percentage of higher-order questions asked and the corresponding change in engagement

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was seen. Between minute 15 and minute 25 the number of higher-order questions asked increased. From minute 25 to minute 35 engagement increased in response. After minute 25 the teacher asked only lower-order questions resulting in a precipitous decline in engagement from minute 35 through the end of the period.

Feldman and Prohaska's warnings about the transactional nature of expectations between students and teachers seem imperative in light of this data. Their research on the Pygmalion Effect in classrooms demonstrated that student expectations can be transferred to the teacher in the same manner that teacher expectations can be communicated to the students, citing differential teacher performance as a result of student, non-verbal behavior (Feldman & Prohaska, p. 471). This implies that student engagement might be considered as the independent variable and teacher question type as the dependent variable. Possibly inherent in the observed trend of increasing frequency of questions in higher-level classes is the expectation (or lack of expectation) that is communicated to students in lower-level classes. In either case and even with the limited data used in these descriptive statistics, there appeared to be a relationship between teacher question selection and student engagement.

By recording the order in which teachers asked questions, this research intended to use patterns of questions asked as a possible way to differentiate the questioning strategies used in different level classes. Anderson et al. (2001) emphasize the power of the Revised Bloom's Taxonomy when used in a cumulative manner towards students' cognitive development (p. 291). After analyzing the data collected, there was only one instance of what appeared to be a discernible pattern. This data set showed exceeding levels of substantive engagement for a class covering a complex and abstract concept. This single occurrence of a cumulative, hierarchical approach to questioning strategy implies a general lack of an apparent questioning strategy, lost opportunity to encourage higher-order cognitive processes in students, and an opportunity for even the best teachers to improve on already high levels of student engagement.

Conclusion

Considering the ubiquitous nature of the internet and whatever will replace it as a source of extraordinary and immediate access to vast amounts of information the results of this study identify an aspect of pedagogy that can benefit all students. Remember and

Understand become less relevant cognitive processes when learners have instant access to information but are faced with sorting and parsing that information for themselves. Students of all ability levels need to learn in a discursive environment in order to develop the invaluable cognitive ability inherent to higher-order questions and accessed via high levels of substantive engagement. Teachers must help students "reduce the tendency towards entropy" (Postman & Weingartner, 1969, p. 3). Lower-order questions are data points adding to the profusion of information, particularly for low ability students. The creation of meaning through higher-order questions and processes brings order to learners through incorporation of new information, harvested through lower-order processes, into existing or new schemas. To borrow the parlance of many of today's schools, the *essential questions* of students are not Remember and Understand. Students' questions are analytical, evaluative, and creative. Questions not answers stimulate student thought and engagement. Student engagement creates an environment for cognitive growth for all learners.

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Teacher Gender, Student Gender, and Verbal Interaction

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Several studies have examined gender's role in the classroom or relationships between students and teachers; few seem to do both. A Masters thesis by Plitzuweit was based on the differences in girls' and boys' brain. She went so far as to test these differences through observations of her single-sex classrooms. Other researchers, like Nunan, have examined how gender plays into other factors that ultimately contribute to student success; their "study focused on the effects of student gender on responses to teacher-posed questions" (2003, p. 113). In fact, this research showed that "most teachers have a disproportionate number of answers supplied by males" (2003, p. 115)

She (2001) conducted researched that involved middle-school science classes and found that teachers have an impact on students' (particularly girls') self-perceptions of their own abilities in science and math. A teacher, the study implies, can be a significant factor in a student's future choice to pursue or not pursue a career in one of those two fields.

In an article from a 1999 version of *English Journal*, teacher Mary E. Stylslinger wrote of her studies within the high school English classroom, the same observational situation as the one in which this study took place. Stylslinger examined how gender might play a role in peer revision of writing. The boys seemed to refuse to talk while the girls were happy to chat and help each other improve their writing through constructive criticism.

Pearson and West (1991) wrote about their assessments of teacher's gender, students' gender, and "students' psychological sex-role" related to questioning in the classroom and found that "student question asking [is] critical to successful participation

in the educational setting," that male college students asked more questions of their teachers than did female students (p. 22). This could have implications on female students' success in those college classes, but also on the teachers'/professors' perceptions of female students' engagement. Godinho and Shrimpton (2002) dealt with virtually the same issue: they worked not with questioning, but with what they called "talk patterns" of boys and girls in literature discussions. "Boys consistently dominated the discussions (Godinho & Shrimpton, 2002)," which may be a hard to reconcile with Stylslinger's observations regarding peer revision of writing. In this science classroom, Guzzetti and Williams (1996) observed that "in teacher-led, whole-class discussion, boys are spoken to and are asked higher level questions more frequently." Kropff's 2006 study on race and gender made the observation that "black females need constant drive, encouragement, and praise" (p. 98), but it can easily be argued that, to counteract boys' dominance of the classroom, teachers need to give all girls this type of verbal feedback. Physical education researchers Hannon and Ratliffe (2007) looked at the way that single gender vs. coed classes had an impact on interaction. They found that "teachers tend to have a higher rate of verbal interaction with female students in single gender settings" (Hannon & Ratliffe, 2007).

Deborah Tannen's research in the business world reveals some interesting points that could have corollaries in the educational setting. In her article "The Power of Talk" (1995), she writes about the dynamics of power within office communication, pointing out that "the patterns that constitute linguistic style are relatively different for men and women." The basic premise is that boys' and girls' socialization and play will affect them later in the adult world. "That is because we learn ways of speaking as children growing up, especially from peers, and children tend to play with other children of he same sex" (Tannen, p. 140). In these early interactions, "girls tend to learn conversational rituals that focus on rapport dimensions of relationships whereas boys tend to learn rituals that focus on the status dimension" (Tannen, p. 140). Boys, conversely, learn to be men who "learn to negotiate their status in the group by displaying their abilities and knowledge, and by challenging others and resisting their challenges" (Tannen, p. 140).

Part of the problem with this whole situation is that "teachers are usually unaware of gender bias in classroom activity" (Guzzetti & Williams, 1996). Good teachers certainly never intended to show favoritism to any one faction of the class, and they probably take steps to avert that particular disaster. However, it seems that students feel this atmosphere of bias emanating from each other. "Both makes and females consistently reported males' domination of science activity and talk about that activity," wrote Guzzetti and Williams (1996). "These data also indicate that students who do not notice gender inequalities are most likely to be males" (Guzzetti & Williams, 1996); it would seem that female students are more affected, on the whole, and therefore notice the bias more.

Primary Research Question

How do students of different genders interact with their teachers?

Secondary Research Questions

Who does a teacher acknowledge more often, the same sex or the opposite? Who speaks up or contributes more to classroom discussion? Is one gender more likely to be ignored by a teacher than the other gender?

Methodology

This is a qualitative study. The subjects of observation and data collection are four master English teachers of a Forsyth County high school and their students. These teachers were purposefully selected by the principal researcher. Class sizes varied.

Measures.

Observations were done, examining who teachers interact with and how many times these verbal interactions occur. The researcher was looking for students who engage in interactions with the teacher (responds to or asking a question, conferencing, jovial conversation, discussion of directions or grades, etc.) Each time a male student spoke directly to the teacher, a tally mark was made in a particular column. This process was repeated correspondingly for a female student speaking directly to the teacher, and

for the teacher speaking directly to a student, male or female.   At the end of each observed class period, these tallies were tabulated into the four categories: teacher to male student, teacher to female student, male student to teacher, and female student to teacher.

Findings

After all observations were completed, the data was compiled into 2 tables (shown below) showing the number of verbal interactions between teachers and students. Then, percentages were calculated to determine which type of verbal interaction was most prevalent within the context of each observed class period.

It was the researcher's hypothesis that male students, speaking to their teacher, would be the group with highest frequency. This was supported with the review of literature, especially the insights of Deborah Tannen. However, this is not what the data actually showed. There was no pattern to show that male students dominated the conversation in the classroom in any way; it might have been the case on some days, in some class periods, with some teachers, but certainly not always. In reality, each of the four groups came up as the overall leader of verbal interaction in any classroom. Of the four paths of interaction, no one path was most prevalent. No differentiation could be made in the classrooms of the female teachers versus the sole male teacher. In short, the results had no set pattern and were therefore inconclusive.

Implications

Because the data did not show any prevalence of interaction from one group to another, it is fairly safe to say that (1) teachers are not overtly applying of their own personal sexist stereotypes to students during verbal interaction, and (2) male students are not to be disparaged for taking up too much of a teacher's attention. While individual interactions might show a trend towards one of these two ideas, neither was upheld by the data.

This study's results may have been distorted simply by the fact that the number of male and female students in each class was not taken into account; further studies could look into the ratio of students to student interactions.

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The Development of Oral Proficiency in the K-12 Spanish Classroom

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In an increasingly globalized world, the ability to communicate with people whose cultures and languages are distinct from one's own is an ever more valuable asset. Accordingly, world languages are now considered a part of a 21st century skill set that all students in grades K-12 should develop in order to be self-sufficient adults and attractive employees (The Partnership for 21st Century Skills, 2004). The American Council on the Teaching of Foreign Languages (ACTFL) developed the *Standards for Foreign Language Learning: Preparing for the 21st Century* (ACTFL, 1996) which represent the content knowledge students should develop in grades K-12. To complement the standards, ACTFL developed the *Performance Guidelines for K-12 Learners* (ACTFL, 1998) which provide the measurement gauge for how well students perform in the foreign language as they gain proficiency over time. Oral language ability is implicit in these communication standards and guidelines.

Review of Literature

Research in second language acquisition in the 1980s led to the proficiency movement as experts in the field gained more knowledge about how one learns a second/foreign language. Krashen and Terrell (1983) promoted the *Natural Approach,* a teaching methodology that emphasizes the importance of providing students with a large amount of comprehensible input in a language rich environment. Additionally, it is important that students have opportunities to be engaged in meaningful communicative experiences, allowing sufficient time for listening comprehension ability to develop prior to early speech emergence. Curtain and Dahlberg (2004) assert that teachers should consistently use the target language in ways that are meaningful and interesting to students.

The proficiency approach also includes the use of authentic materials (Magnan, 1987). These are materials that are produced by members of the target language culture

for target language speakers of the same culture. Authentic sources such as réalia found in daily life activities, articles, literature, and audio and video presentations give students a chance to see purposeful language usage in context (Shrum and Glisan, 2005). Réalia not only provides cultural information for students, but it can also be used to foment communication through initiating conversation or raising questions (Curtain & Dahlberg, 2004: ACTFL 1996).

In addition to authentic materials, the increasing availability of computer technology offers teachers more tools for promoting oral language ability. At the elementary grades level, Nutta, Feyten, Norwood, Meros, Yoshii and Ducher (2007) found that using computer software with authentic language can help students retain more language, use better pronunciation, and have smoother flow over time. Media can be another source of comprehensible input and a basis for oral language activities in proficiency oriented classrooms. Glisan and Drescher (1993) suggest that authentic video and audio texts can supplement textbooks which may have insufficient amounts of authentic texts.

The *Standards for Foreign Language Learning* describe the content goals of proficiency-oriented K-12 instruction (ACTFL, 1996). The presentational and interpersonal modes of communication focus on language production and the use of language for different purposes. Several types of classroom activities can help students practice their oral language with these two communication modes in mind. Information Gap Activities permit students to practice strategies, such as asking for additional information, asking for clarification, and negotiating meaning (Shrum & Glisan, 2005). Oral ability in a foreign language can also be developed through classroom debates and oral presentations (Omaggio, 1983). Likewise, storytelling can provide students with comprehensible input with the aid of gestures, appropriate intonation, visuals, and réalia. (Curtain & Dahlberg, 2004: Hadley, 2001). Both Hadley (2001) and Todhunter (2007) stress that discussions in the target language for the purpose of activating schema prior to reading, listening and writing activities can provide students opportunities to improve their oral proficiency.

As students develop and gain oral ability, teachers should assess their language progress. ACTFL's *Performance Guidelines* (1998), offer teachers direction as to how

well their students should be performing in all areas of proficiency, including oral language. The *Performance Guidelines* (1998) suggest *comprehension, comprehensibility, language control, communication strategies, vocabulary use* and *cultural awareness* as guidelines for assessment. Audio-taped language samples, role-plays, skits, debates and storytelling can serve as strategies to assess these areas (Hadley, 2001). Like conversations and interviews, these strategies may be practiced as classroom activities and offer opportunities for student creativity. Shrum and Glisan (2005) and Curtain and Dahlberg (2004) stress that assessment practices should align with the standards found in the curriculum.

Teachers have a variety of instructional and assessment strategies at their disposal to provide the content outlined by the *Standards for Foreign Language Learning* and to determine ability level as enumerated by the *K-12 Performance Guidelines*. Given the variety of options instructors have, the purpose of this study was to investigate instructional and assessment strategies used by K-12 teachers of Spanish to promote oral language proficiency. The study also investigated how these strategies align with ACTFL *Standards* and *K-12 Performance Guidelines*.

Methodology

This research study took place between September and December 2008. Subjects of this study were fourteen K-12 teachers of Spanish in a central North Carolina school district, from elementary (4), middle (5), and high schools (5), teaching a variety of levels. The teachers chosen for the study were selected based on the advice of the researcher's advisor and the availability of said teachers. The researcher conducted a two-part study. First, the researcher interviewed each subject using a self-designed instrument. Then, the researcher coordinated with five teachers to observe their class during a typical class period. The researcher observed those five classes to compare data obtained from the interviews with that acquired from the interviews.

Results and Conclusions

The following discussion addresses information gathered during the interviews and observations. It addresses the instructional and assessment strategies teachers use to promote oral language ability as well as their expectations of students' oral language proficiency.

Although all the subjects in this study teach in the same school district, they reported very different expectations for students' oral foreign language development on the school and the district levels. While several subjects mentioned the state curriculum (3), others (7) said the school system and their schools had low/inexistent or vague expectations. Others mentioned some generalities and only a few mentioned specific outcomes. In contrast, teachers had much clearer personal expectations for their students' oral language ability.

While most teachers responded that none of the areas of communication, reading, writing, speaking, and listening, is more important than the other, eight of the fourteen teachers believe that one of the modes of communication is more important than the others. The classes the researcher observed generally had many opportunities for students to utilize the interpretive and the interpersonal modes of communication, but one class observed had clear opportunities for all three modes of communication.

The researcher found that overall, middle school teachers (5) self-reported using less of the target language and more English with students than either elementary or high school teachers (9). The one middle school class that the research observed was consistent with this trend. While not reflected in a specific interview question, other middle grades teachers also referred to the personal and social concerns of middle school students.

A variety of verbal strategies helps students scaffold language as they acquire new language. All teachers reported using a variety of verbal strategies to assist students' oral language production and the researcher observed several of these strategies in action in the classes observed.

The teachers reported a wide-range of the amount of classroom instruction devoted to developing students' oral ability. Generally elementary teachers reported the most, high school teachers less, and middle school teachers even less. Observations were consistent with the self-reporting.

While teachers reported the use of a wide variety of materials and activities to develop oral language ability, activities which require the use of technology during the lesson are least common. Teachers cited a lack of time and access as reasons not to use software or television. Furthermore, teachers expressed doubts about the effectiveness of

software and television compared to the planning time necessary to use them. Likewise, many teachers stated that authentic resources are often difficult to obtain. Nearly every teacher reported using pair/group conversations, games and presentations as activities they use to develop oral language ability. The variety of activities reported and observed are consistent with research supporting numerous methods to present and practice oral language usage.

With respect to assessment of oral language ability, some teachers (4) do not believe that their students reach a level of proficiency high enough to have communication strategies, accuracy, or cultural awareness to assess, despite the fact that these areas are mentioned in the *ACTFL Performance Guidelines* (1998). Additionally, while all teachers affirmed using a variety of assessment measures and strategies, elementary school teachers stressed that their approach to assessment is almost entirely informal in nature, again due to not giving formal grades. Elementary and middle school teachers said that they avoid using oral components on tests/quizzes and all teachers avoid using audio-recorded sample language and classroom debates; generally speaking, teachers found oral tests and audio-recorded language to be time-consuming and not practical with the large numbers of students they teach. Classroom debates were considered beyond the scope of most of the students' ability. The researcher observed several activities that appeared to be informal assessments, such as games and interactive activities which were consistent with the reporting of many strategies to assess oral language ability. The vast majority of teachers who give grades weigh oral assessments as approximately 26-50% of the grade with many of those teachers reporting around a third of the final grade deriving from all oral assessments.

The teachers generally spoke to the importance of ensuring that assessment practices match instructional practices and making a conscious effort to do so. The informal assessment practices observed appeared to align with instructional strategies and how teachers' self-reported their instruction. Notably, when speaking about expected proficiency levels upon completion of the program at the school level and the district level, the teachers were consistent within their own level (e.g. high school), often mentioning specific communicative tasks, although most were not specific about a

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proficiency level on the *ACTFL* scale. This consistency was not found between levels of instruction.

In conclusion, from the interviews and observations, the researcher believes that teachers in this study recognize the importance of oral proficiency, the use of ample comprehensible language input, and the use of a variety of strategies to develop and assess oral language ability. At the same time, constraints of time, limited resources, concerns about student comprehension and the lack of a fully articulated foreign language program appear to limit students' possibilities to develop oral proficiency. The researcher believes that further studies with longer periods of classroom observation as well as comparative studies of school districts with various levels of articulation are necessary to provide more meaningful data about the strategies used to develop students' Spanish oral proficiency to permit foreign language educators to discern the most effective strategies to assist students in developing oral language proficiency in Spanish.

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Teacher Use of Formative Assessment in Science Classrooms

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Ruiz-Primo and Furtak (2006) describe formative assessment as an informal conversation that occurs through a four part cycle. The parts of the cycle are elicit, share, recognize, and use (ESRU) and are shown below in Figure 1 as an adapted diagram.

Figure 1: The ESRU cycle
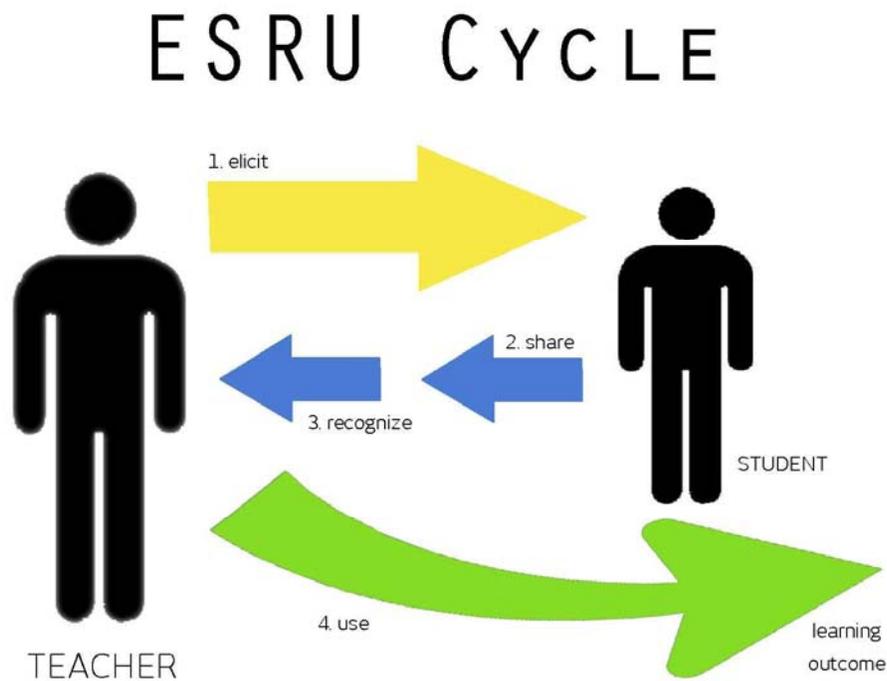
The cycle begins with the teacher eliciting a response from the student. According to Ruiz-Primo and Furtak (2006), "Eliciting requires the teacher to ask questions that allow students to share and exhibit their understanding as completely as possible" (p. 208). Eliciting questions need to evoke student thinking and lead to elaboration, so the teacher may gain insight. Eliciting is a crucial step to put the cycle into motion. The student then

has an opportunity to fully *share* his or her thoughts and ideas with the teacher. Next, the teacher must recognize the student's response. At this point, the instructor has the responsibility of taking hold of what the student says. This might mean restating the student's question as the teacher "[compares the contribution], perhaps implicitly, to some learning goal" (p. 208). Thus, the teacher needs to quickly analyze the student's thoughts with respect to the learning goals the question was intended to address. Finally, the teacher must use the knowledge gained and take action to guide the student(s) to a learning outcome.

Formative assessment is a deliberate and ongoing gathering of information about student understanding that is then used to feed back into the learning environment (Black & William, 1998; Cross, 1998; Gipps, 1994; Ruiz-Primo & Furtak, 2006; Wormeli, 2006). Three essential components emerging from this definition are bidirectional, continuous, and intentional.

Formative assessment is bidirectional by involving cooperation between students and teachers in a way that increases student learning while instruction is occurring (Bell & Cowie, 2001). Formative assessment not only involves a gathering of information by the teacher, but also provides a feeding back into the learning environment (Gipps, 1994) and in this way is also bidirectional. According to Black and William (1998), assessment becomes formative when an action is taken with the information received from that assessment. As seen above in the ESRU diagram, formative assessment must include action on the part of the teacher and the student in order to be bidirectional.

Another essential characteristic of formative assessment is being continuous. In an article about accountability for students, Wormeli (2006) stresses the importance of feedback that occurs simultaneously with instruction. Assessments occurring after the instruction has taken place do not give students an opportunity to reflect on their learning. Womeli (2006) suggests that "real learning of both the topic and personal responsibility comes from specific, timely, and frequent feedback to students during the learning, not after the learning" (p. 24). Liu (2009) supports the notion that formative assessment occurs simultaneously with instruction in the classroom. There is an implication that teachers are constantly using what they learn about their students' knowledge to fine tune

and even alter their instruction. In order for formative assessment to be continuous, the teacher and student must be frequently completing full ESRU cycles.

Formative assessment must be planned and is therefore intentional. According to Black and William (1998), formative assessment can promote learning when the chance for students to express what they know is built into the lesson plan. Assessment must be an intentional component of the instructional time. The lesson and the formative assessment should not be two separate entities, but rather two parts, irreversibly woven together for an instructional whole (Black & William, 1998). Wormeli encourages teachers to devote more time to planning formative assessment activities (2006). Duschl and Gitomer (1997) agree stating, "We describe the assessment conversation, which is a specially formatted instructional dialog that embeds assessment into the activity structure of the classroom" (p. 39). Formative assessment becomes a vital component of lesson planning when embedded into the lesson. In order for teachers to implement intentional formative assessment, they must think ahead of time about questions that will elicit student thinking as well as intentionally plan to move students to a learning outcome.

ESRU provides a conceptual framework for evaluating formative assessment with respect to being bidirectional, continuous, and intentional.

Methodology

A qualitative study was performed to explore the use of formative assessment in three science classrooms. Research was carried out in Winston-Salem/Forsyth County Schools. Three teachers at two schools within the district participated in the study. Penelope is an environmental science teacher who has been teaching science for fifteen years. She has her Bachelor of Science degree in Biology and went back to school for a year of education classes in order to obtain her teaching certificate. Later, she earned her Masters of Science in Geoscience. Denise has been teaching high school science for twenty-two years. She has a Bachelor of Science in Large Animal Agriculture as well as a Masters in Secondary Science Education. Ethan has been teaching high school science for three years. He was an education major during his undergraduate education and went through student teaching. The following year, Ethan went on to earn his Masters in Education.

A two part qualitative study was performed with each participant. The first part was an interview. During the initial part of the interview, teacher's background was solicited to gather information about their education and past teaching experience. Then, questions about formative assessment were asked to determine teacher's familiarity with this strategy. The second part of the research was a classroom observation. Each teacher participated in one to three class observations. The goal during each observation included citing specific examples or non-examples of formative assessment focusing on the interaction between teachers and students.

Results

Understandings of Formative Assessment

Penelope has a naive understanding of formative assessment and defined formative assessment as "…a testing of what students know as they go through the course." She said it sort of reaffirms what students are learning, but she did not mention using that information to feed back into the learning environment. Thus, her understanding was naive.

Denise has a more thorough, but still developing, understanding of formative assessment. She defined formative in this way:

> Formative assessment, to me, is checks in various forms by the teacher of the student's understanding of what's being taught at that moment… oh you know, just to see where are they in this part of understanding what I'm trying to get them to understand.

Denise also considered formative assessment to be a very automatic practice for her. She claimed to have been implementing formative assessment all along and was surprised when the term was introduced to her for the first time.

> When asked to define formative assessment in his own words, he said: Formative is before the end of whatever it is you're teaching (as opposed to summative). Formative is where you're trying to get some feedback as you go along on what they're learning and also too … more important for me is to give [the students] feedback on how they're doing."

Ethan showed the most thorough definition of formative assessment because he included the importance of feedback for students. Ethan did not limit formative assessment to being only a gathering of information. Also, he intentionally implemented

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multiple strategies in his class such as in class quizzes and questions built into his PowerPoint presentations.

Implementation of formative assessment

Despite varying understandings of formative assessment, all three teachers failed to implement full ESRU cycles. Penelope achieves a partial ESRU cycle during her implementation of formative assessment. Her assessment is partially bidirectional, not continuous, and fully intentional. Denise's formative assessment is partially bidirectional, not continuous, and moderately intentional because she considers the practice of formative assessment to be automatic. Ethan, although he is fully intentional in his formative assessment, is also partially bidirectional and therefore not continuous in his implementation of the ESRU cycle. All three teachers asked questions that elicited student thinking while often providing students with times to share a response. However, none of the teachers completed phase three of ESRU which is recognize. They therefore failed to tap into student thinking resulting in a non-continuous implementation of formative assessment.

<div align="center">

Conclusions

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Teachers with varying levels of experience lack proficiency with respect to the three characteristics of formative assessment outlined in this paper. Although the teachers with education degrees showed a more thorough understanding of formative assessment, none of the participants showed a comprehensive understanding and implementation of bidirectional, continuous, and intentional formative assessment. This indicates a possible lack of awareness of formative assessment with respect to the ESRU cycle. As a general trend, teachers' perceptions of formative assessment match their classroom practice. With this in mind, there is an implication that if teachers have a perception of formative assessment that is in line with ESRU, they will be more likely to implement full ESRU cycles.

Teachers did not implement full ESRU cycles resulting in missed learning opportunities. While students may achieve stated learning outcomes without progressing through the cycle, Ruiz-Primo and Furtak (2006) found that full implementation of the cycle increases student achievement with respect to learning outcomes. Thus, the ESRU

cycle provides a valuable strategy for teaching teachers. Since teacher understanding matched their practice, including the ESRU cycle into teacher training might influence teachers' implementation of formative assessment that is bidirectional, continuous, and intentional.

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