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No, Seriously: Humor Use by High School Social Studies Teachers

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For this study, I explored the use of humor in local high school social studies classrooms and categorized its inclusion as a useful component of teaching. Many of the most successful teachers from my own experiences as a student infused the classroom setting with humorous anecdotes, sarcasm, puns, and self-critical humor, while maintaining a witty repartee with the students. Conversely, many of the teachers who failed to awaken my motivation lacked any humorous content in their classes. Although I do not think humor is necessarily the most important factor in effective teaching, I hope to explore its use as a means to engage students in the content and create a more positive classroom setting. Also, since many of the studies that have been done on the topic of humor in the classroom focused mainly on colleges and took place more than ten years ago, I feel my study will contribute to the body of knowledge by showing recent developments and humor usage among high school teachers. Additionally, almost all of the research studies I looked at focused on interdisciplinary use of humor, rather than concentrating on a particular subject such as social studies. With these motivations, I attempted to characterize the different types of humor being used in high school social studies classrooms in order to discover the extent of its use. This was done through qualitative observations in which I recorded the number and type of humorous elements taking place in the classes of seven teachers over the course of several weeks.

Literature Review

Whether trying to entice students to pay attention by telling a funny anecdote about their weekend or presenting the ironic details of Descartes' head being separated from his body after burial, when he had theorized about the dual nature of mind and body (Henry, 2000, p. 64), teachers in high school use humor in various instances. According to some educators, humor not only entertains but also causes students to pay attention. Tatum (1999) uses the example of puns as a specific type of humor which can engage the class, claiming that puns "compel students to pay closer attention" (p. 62). Although puns generally tend to elicit groans rather than laughter,

Tatum claims that, from her experience, frequently switching the meanings of words keeps students on their toes, intellectually speaking. Consequently, students pay attention more studiously to the teacher and content since they are not able to simply slip into a daze.

Mugleston (1989) contends that providing students with items such as humorous stories goes a long way toward invigorating student discussions. Henry (2000) provides the example of telling ironic anecdotes about historical figures and events to elicit greater interest in social studies. Korbkin (1988) states that teachers who possess a "willingness to be spontaneous and 'imperfect' enough to laugh at [themselves] will better enable…a sharing and concerned attitude among all learning participants" (p.155). Bryant, Comisky, Crane, and Zillman (1980) concluded that "humor in teaching has tangible benefits" in interdisciplinary college classroom teaching (p. 517). Meanwhile, Gorham and Christophel (1990) further developed on previous ideas by concluding that the "volume of humor [is] less important than [the] composite of humor" (p. 60).

Some studies conducted in college classrooms have concluded that the use of humor is effective to various extents. Bryant et al. (1979) found that humor was used extensively in college lectures, with self-deprecating humor standing out as the most prevalent. Downs et al. (1988) analyzed humor usage among regular as compared to award-winning teachers, finding that each used different types more frequently. Ziv (1988) analyzed humor usage in Israeli college classrooms, finding that humorous lectures, as determined by *ex post facto* analysis, had students who performed better on tests. While these studies had been conducted exclusively in interdisciplinary college classrooms, Marklin (2001) catalogued humor usage in high school English classrooms, finding that sarcasm was used prevalently. Since none of these aforementioned studies addressed both social studies and high school together, further research is necessary to determine the specific types of humor being used.

There are also studies that have disputed claims about the effectiveness of humor in teaching. Though Kaplan and Pascoe (1977) allowed that the specific material presented humorously would be better retained, they still asserted that "general comprehension and retention of a classroom message is not significantly improved by the use of humor" (p. 65). Also, Downs et al. (1988) compared humor use among random groups of teachers and award-winning teachers, finding that the best teachers, according to award classifications, were actually using humor less frequently in their classes.

Methodology

Data was collected through classroom observation. The participants for this study were selected by random sampling as the first five teachers who responded to an email letter requesting participation in a study on humor in the classroom. Two additional participants were chosen through snowball sampling or recommendations from initial research participants. The subjects were comprised exclusively of teachers from the local county and included three males and four females. The decision to choose subjects such as these relates to their proximity to the researcher and their willingness to help in the study.

My observations of the seven teachers' classrooms took place over several weeks in which I recorded the type and frequency of humor used during each class period. Using the categories of pun, physical humor, mocking students, self-mocking, sarcasm, anecdotes, strange voices, and vocal oddities, all humorous comments were recorded in an initial category. These initial categorizations were reviewed after each class to assess their accuracy and sometimes reassign comments to a more appropriate category. Humorous comments were scored as a pun when the teacher used a play on words. Anecdotes were recorded when the teacher used a humorous story. Sarcasm was recorded when the teacher used sharp irony with words or tone. Self-mocking humor involved all instances of the teacher mocking himself or herself in an effort to elicit a positive response from the class. Physical humor was noted any time the teacher used physicality for humorous purposes. Strange voices encompassed humorous voices such as affected Scottish accents or imitations of famous actors' voices. Vocal oddities included humming, singing, or any other nonsensical verbal output.

Analysis and Discussion

Among the varieties of humor categorized, three types were used the most: sarcasm, mocking students, and anecdotes. Sarcasm and mocking of students, two types of humor that could potentially be perceived by the students as being negative, wound up accounting for nearly two-thirds of all humorous comments by teachers. Sarcasm was the most widespread type of humor teachers used, contributing 40% of all humorous content (See Figure 1). This type of humor far outpaced all other types of humor, aided sometimes by the fact that other types of humorous content were often presented in an ironical or sarcastic nature. For example, many of the comments teachers made mocking students were often represented in both the mocking

students and sarcasm categories, reinforcing the dominance of each. Teacher comments mocking students in some form made up 20% of all elements of humor observed.

The third largest percentage of humorous comments came in the form of anecdotal humor, registering 16% of all comments. Despite its overall prevalence in the number of occurrences, I found that one teacher in particular used this type of humor much more frequently than any of the other participants. While there was some variation between the average use of a humor type and the use by any particular participant, the frequency of anecdotes used by this one teacher was immensely different. While the other six participants used anecdotal humor an average of just over three times overall, this teacher used anecdotes 23 times during the period of observation, a sizable difference which skewed the final study results toward the greater frequency of anecdotes in history classrooms.

The research showed that these teachers used humor an average of just over 19.14 times per 48-minute class period. I found overwhelmingly that humorous comments and other elements were not actually pertinent to the course material, or even the administrative tasks of the class. Fully 73% of all humorous elements were found to be unrelated to learning. As was found in previous studies (Bryant, Comisky, & Zillman, 1979; Bryant, Comisky, Crane, & Zillman, 1980; Downs, Javidi, & Nussbaum, 1988), male teachers in my study, on average, used almost every type of humor more frequently than the female teachers.   Particularly in the most prevalent categories of mocking students, sarcasm, self-mocking, and anecdotes, male teachers used these elements noticeably more often than their female counterparts. The only category that female teachers used humor more often was in vocal oddities, however this was one of the most infrequently used categories across the genders, so it is difficult to assess the difference with much meaning.

There also appeared to be some relationship between humor use and the length of the period. In three of the four most prevalent categories (mocking students, self-mocking, and sarcasm) teachers on a seven-period schedule used humor more frequently than teachers on a block schedule. Teachers on a seven-period schedule used humor more frequently in the three most infrequently used humor types as well; puns, strange voices, and vocal oddities. However, teachers on a block schedule used physical humor and anecdotes more often than their counterparts on the shorter schedule.

This study has shown that various types of humor are used with some frequency in high school social studies classrooms. Though the sample size for this study was small, it is fairly clear that there is widespread use of humor in social studies. While previous studies have looked at the efficacy of humor use, primarily in college classes, this study has illustrated the frequency that specific types of humor were being used in the classrooms of the seven participants.

Figure 1 — Distribution of Humor
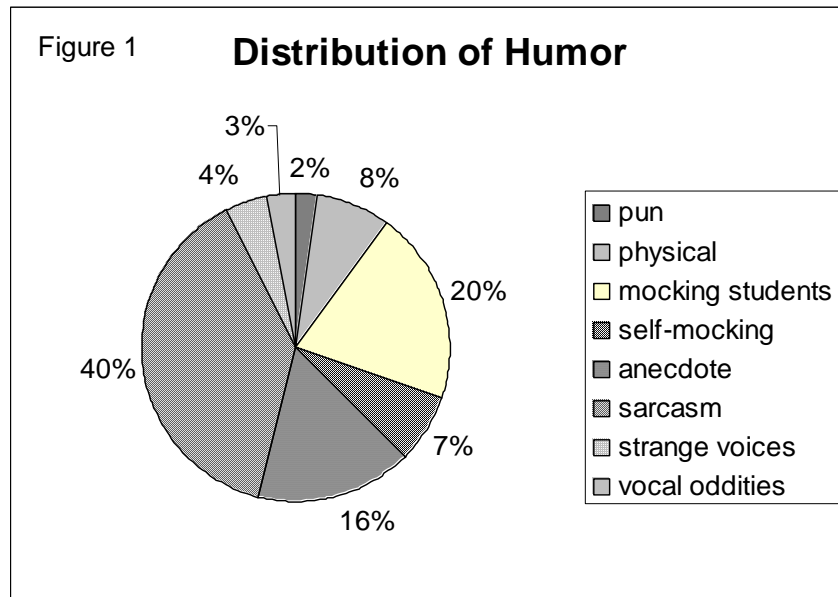
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The Relationship of Teacher Generated Lecture Questions, Lab Questions,

Test Questions, and Student Achievement

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Introduction

The role of questions in education has long been established as an important one. Socrates, a famous Greek philosopher, was known for his method of teaching by only asking questions. His "Socratic Method" set a firm foundation of questioning in education. Since the Greeks, questions have followed education as a way for teachers to assess students' learning. And as a major part of education, questions also serve as a focus of interest in educational research.

Literature Review

Bloom ranks questions in six categories, each more demanding of cognitive processing than the last: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation.

The effect of teacher generated questions has been shown to affect the cognitive level of student thought processes. In a study by Cuccio-Schirripa and Steiner (2000) on 184 middle school students studying research, the effect of instruction on student achievement was shown to be a positive one. In this study, students were broken up into two groups; one received instruction about a lab while the other received no instruction at all. The students generated questions, which were analyzed based upon a generated scale. The levels on the scale, as reported, also relate to the levels in Bloom's taxonomy; the higher the level in Cuccio-Schirripa's scale, the higher the cognitive level of the question, based upon Bloom's taxonomy. The cognitive levels of the questions generated were greatly affected by the amount of instruction and questioning received. Students who received more instruction in the study were able to generate higher cognitive level questions, on a significant level. The study shows that instruction can affect the cognitive levels of students.

A study conducted by Soled (1994), shows that student performance can be affected by question cognitive level and other material handed out in class. Soled grouped seventh grade science students and experimentally altered the type of instruction they'd receive, based upon three variables, including levels of questions asked and cognitive level of materials presented. Soled's study found that students asked higher level questions in class achieved better than those who were asked lower level questions; on both higher and lower level test items. However, Soled's study also proved that students who receive higher level questions and higher level materials in class performed substantially better than students who either received higher level questions and lower level materials or lower level questions and lower level materials. Materials offered in class can be used to augment the benefits received from higher level questions.

Test questions can identify the cognitive level that students are capable of operating on. Bloom (1957) states that there is much difficulty in classifying test exercises, because "before the reader can classify a particular test exercise he must know, or at least make some assumptions about, the learning situations which have preceded the test" (56). By simply observing the learning situations that take place before the test, an observer can classify the cognitive levels of test questions. Similarly, the product of those test questions, the student's answers, can also be analyzed to determine the cognitive level at which the student is answering the question on (Enger 1997).

Consequently, more research should investigate the relationship that teacher-generated questions play in student achievement. There seems to be a relationship between lecture and lab question cognitive levels and student achievement. There also seems to be a link between the cognitive question levels of test questions and student achievement on the questions. Each of the studies involving teacher generated classes involved modifying a teacher's curriculum to fit the study. A natural study, in which the teachers are control their teaching practices, would better simulate the different cognitive levels of questions in a science classroom. A natural study of the relationship between teacher generated lecture questions, lab questions, test questions and student achievement seems warranted.

Methodology

Three high school teachers were chosen, based upon their accessibility. The teachers were selected from two physical science disciplines, Chemistry and Physics, and a life science

discipline, Anatomy. In order to streamline the data collection process, teachers were observed in rounds. Observations for a teacher began the day after he or she administered a test, and continued until he or she administered another test. Questions delivered in this period, then, related only to the subject matter on the final test. Each teacher was observed for an hour and a half; one class period for block scheduling, two class periods for non-block scheduling, and all questions that the teacher delivered during that time were written down. A running tally of the various cognitive levels of the questions was kept during observation. When a teacher administered a test, copies of the graded tests were collected. Each test was analyzed to determine the cognitive levels of the questions, and each student's answers were analyzed for cognitive level and correctness.

The cognitive level of all questions asked were grouped according to Bloom's Taxonomy, with a number assigned to each level: 1 for Knowledge, 2 for Comprehension, 3 for Application, 4 for Analysis, 5 for Synthesis, and 6 for Evaluation. Percentages were computed for each of the teachers on each of the levels: lecture, lab, and tests. Each student test was analyzed, and a percentage of questions answered correctly on each cognitive level was also compiled for each teacher. Finally, each student's answers were analyzed to determine whether or not they were answered on, below, or above the cognitive level of each question.

Finally, data for all of the teachers was entered into SPSS, for correlation analysis. The variables were: Cognitive level of questions, number of questions asked in lecture, number of questions asked in lab, percent of questions answered correctly, percent of questions answered incorrectly, percent of questions answered on the same level, percent of questions answered below the same level, and percent of questions answered above the same level. A Pearson Coefficient correlation was run on each of the variables, to determine relationships between them.

Results and Discussion

All of the teachers asked a large percentage of Knowledge level questions (48.7%), far more than the next highest level, Comprehension (27.9%). The highest levels of questions (particularly evaluation and synthesis) were asked only in lecture, and not repeated on tests. Laboratory questions represent a very small portion (6.6%) of the number of questions asked by all teachers.

Teacher A wrote and administered a 30 question test, and 49 student responses to each question were collected from the copied tests. Teacher B wrote and administered a twelve question test, and 41 student responses to each question were collected from the copied tests. Teacher C wrote and administered a 72 question test, and 20 student responses to each question were collected from the copied tests. Student responses were then analyzed, according to two criteria: whether the student answered the question correctly (according to the teacher's grading), and whether or not the answer was on the same cognitive level as the question.

There is a significant (p=.043) negative correlation (-.647) between the number of questions answered on the same level as the question and the cognitive level of the questions being asked. There is a relationship between the cognitive level of test questions and the percent of answers on the same level of those questions. The negative correlation means that students are more likely to answer higher cognitive level questions (Analysis was the highest observed) on lower cognitive levels, than they are to answer lower cognitive level questions. These results can be expected, as it is impossible for students to answer Knowledge level questions on a lower level. Further support for these findings is found in the study conducted by Enger (1997).

There is an insignificant (p=.146) negative correlation (-.457) between the number of questions answered correctly and the cognitive level of the questions being asked. So, there is a relationship between the cognitive level of test questions and the percent of correct answers of those questions, but it is insignificant. The cognitive level of the question being asked on a test does have a slight negative correlation. This means that students answer more high cognitive level questions incorrectly than low cognitive level questions.

The relation of lab questions to student achievement was not shown by this study. The relationship of cognitive levels of test questions to correctness was not shown by this study. However, the negative relationship of test questions to was shown. Teachers that wish to use high cognitive objectives must be aware that the higher the cognitive level of the question on a test, the more likely a student is to answer the question on a lower level.

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Warring in the Classroom:

How Secondary Social Studies Teachers Addressed the Controversial War on Iraq

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Introduction

On March 20, 2003, the United States of America launched a predawn missile attack on Sadaam Hussein's Iraqi regime. Later that morning, America's youth got up and attended school as usual. Did they conduct their subsequent classes as usual, though? Did teachers interrupt their lesson plans to discuss the war with their students? Did they give students an opportunity to discuss what spurred the attack or how it compared to other historical events? Or did they even mention the War on Iraq? This study considered and explored these questions through interviews with six high school Social Studies teachers who taught as the events of the War on Iraq unfolded in Spring 2003.

The War on Iraq presented high school Social Studies students and teachers with an opportune time to discuss a controversial issue and examine war from a historical perspective. Studies suggest that discussions of such issues are "critical for developing higher level reading skills and for refining understanding" (Santa, Havens & Maycumber, 1996, p. 4). The National Council for the Social Studies even says that "Social studies educators have an obligation to help students explore a variety of positions in a thorough, fair-minded manner" (1994, ¶ 23).

Studies have also shown, however, that many teachers avoid controversial "hot topics" and current events such as the war (Nelson & Drake, 1990). Zeigler (1967) suggested, "Teachers do not regard the classroom as a suitable forum for the expression by teachers of controversial opinions" (p. 101). This study intended to examine how secondary Social Studies teachers addressed the War on Iraq in their classes. The researcher gathered data through interviews with six secondary public school Social Studies teachers in a southern mid-size town and explored specifically how teachers addressed the War on Iraq and what factors influenced their decisions.

Literature Review

According to the *New Encyclopedic Dictionary of School Law*, educators do not have a constitutionally protected right to "say whatever they wish or to use any materials they alone

deem desirable" (Gatti & Gatti, 1983, p. 24). Although many current and controversial events may relate in some way to Social Studies, educators often decide that the topics are either unsuitable for their students or else not pertinent enough to their course content (Haas & Laughlin, 2000; Wilson, Sunal, Haas, & Laughlin, 1999). Still, in a day and age where lawsuits in education are on the rise (Garner, 2000), many educators choose to avoid subjects like current events, regardless of their importance or relevance, simply because they could elicit unwanted attention.

Although formal research has yet to be conducted on how secondary Social Studies teachers responded in the classroom to the War on Iraq, several studies have focused on teachers' attitudes towards current events and controversial topics in general and how they choose to handle them. Zeigler (1967) studied teachers' beliefs about proper classroom behavior and discussions and found that "the greater the perception of probable sanctions, the less proper the behavior is perceived [by teachers] to be" (p. 101). Many of the teachers he interviewed were wary of the complaints they might receive from parents, school board members, principals, and other teachers if they overstepped their boundaries.

Evans, Avery, and Pederson (2000) also noticed a trend of passivity and decided to try measuring teachers' attitudes prior to "in-depth socialization into the school culture" (p.3). They surveyed thirty-two pre-service Social Studies student teachers on their perceptions of general "taboo topics" and found that "the greater the distance in space and time from the individual lives of students, the greater the focus in the curriculum and the less chance of emotional involvement in controversy (Evans et al., 2000). Thus the study implies that teachers' tendencies to avoid controversial issues also stem from their experiences even prior to teaching. It also suggests that Social Studies teachers who taught during and shortly after the War on Iraq would have been more likely to discuss less recent conflicts than the War on Iraq.

McAlister (2000) found, however, that teachers may still avoid topics that are further removed from students in time and space. McAlister conducted a study about teachers' feelings towards the issue of slavery and Reconstruction and found that while teachers enjoy student discussion of controversial subjects, they feel uncomfortable when conflict occurs between students. In addition, many of the teachers in McAlister's study expressed concern that controversial subjects or current events took up class time that could be used to cover material that appears on the end-of-course exams.

Nelson and Pooler (1994), on the other hand, found that teachers were willing to make a current controversial topic – the 1991 Gulf War – a focus of class time. They found that ninety-four percent of the teachers who responded to a survey had interrupted their planned curriculum to study the Gulf War. Still, while a high percentage of the responding teachers discussed the topic in their classes, very few of them created handouts, used textbooks or library resources, or engaged students in research as they did with other topics covered in their classes. The teachers did not consider the Gulf War a high priority in their classrooms and thus did little to actually develop the topic educationally or include it in their learning objectives.

Methodology

This study used qualitative methods to gather insight into how teachers presented the War on Iraq and what factors influenced their decisions. Secondary Social Studies teachers from a southern mid-size town were invited by email to participate in the study. The only requirement of the subjects was that they taught a secondary Social Studies course during Spring 2003. Six teachers voluntarily agreed to participate and signed an informed consent letter and the researcher pledged to maintain the anonymity of both the teachers and their schools.

The researcher interviewed each teacher for approximately forty-five to sixty minutes and recorded information by researcher notes. The interviews were partially structured by a series of open-ended questions on how teachers addressed the War on Iraq in their classrooms. Each of the questions fell under one of the following categories: teachers' opinions on controversial issues in the Social Studies classroom, teachers' decisions on how to address the War on Iraq in their classrooms, the outside influences and reactions that teachers' perceived towards their decisions on how to handle the War on Iraq, and teachers' perceptions of the War on Iraq as a controversial topic. After completing the interviews, the researcher compiled the data and analyzed the results, comparing each category of questions for similarities and differences.

Results and Conclusions

Although we must be cautious in making generalizations from the results of this small sample, some patterns did emerge. All six teachers agreed that controversial topics and current events are an important part of the Social Studies curriculum and must be covered in order to meet students' needs. All six teachers also said that they addressed the topic of the War on Iraq in their classrooms. Overall, the six teachers perceived themselves to be very comfortable with controversial topics in their classes.

While three of the teachers assigned research or graded work, they all agreed that discussion was the primary method used to address the War on Iraq and that discussion was also the best manner to approach the war. Unlike what other studies showed, the teachers did not view discussion as an activity reserved for topics of less importance. All of the teachers considered their discussions to be a forum for students to vent their feelings and make sense of what they were viewing at home on the television. These discussions did not always lead to a consensus but rather, as Teacher E said, "allowed students to explore." The teachers functioned mainly as a resource of information when students could not answer the questions themselves. Five of the teachers said that the discussions were usually initiated by the students and sometimes by the teachers. The overwhelming view among the teachers was that it was okay to sacrifice their lesson plans and curriculum if the students chose to interrupt it themselves.

The general feeling among the teachers was that it was impossible to conduct a class about a controversial topic without being biased. Five of the teachers openly acknowledged that they did not present both sides of the war and said they felt that it was okay to be biased as long as it was made clear to the students that they were sharing their opinion and not fact. Three of the five teachers who admitted to being biased, however, also expressed concern and dissatisfaction about their presentation of the war and Teacher C even claimed to be "scared" when she heard that some teachers were "getting in trouble for being biased about the war."

Teachers perceived students' responses to the discussions of the War on Iraq to be very positive. All six teachers said that their students seemed genuinely interested and curious about the war. According to the six teachers the responses from parents and faculty members were not as positive as the students' responses. As a whole, the teachers said that parents' and school administrators' reactions towards students' discussions of the war were either indifferent or wary. Half of the teachers were unaware of any school policies and the other half mentioned rules such as "being objective" or "turning off live coverage in the classroom." The teachers all agreed that they handled the War on Iraq the same as any of the other controversial topics that they covered in their classroom. All of the teachers expected to discuss the war in their future classes when talking about the future presidential campaign, U.S. involvement in world affairs, and relations with Iraq and other Middle Eastern countries.

The results of this study suggest that controversial topics in the Social Studies classroom will continue to be controversial and that further research on this topic is necessary. As Teacher

E suggests, controversial topics are tied to "deep-rooted social issues in America and they cannot be avoided or else we risk avoiding the reason why we teach Social Studies courses." We can conclude that this sample of six teachers placed great value in addressing controversial topics like the War on Iraq in their classes. At the same time, these teachers also felt strongly about the war and their own feelings influenced how they addressed it in their classes. Still, they felt that it was important to use discussions to meet students' needs and they all intended to continue addressing the War on Iraq and other controversial topics in the same manner. Though they acknowledged that school administrators were wary of offending students and parents, the response from students was positive and the teachers expected to continue allowing students to discuss topics like the War on Iraq. At the outset of this study, the researcher acknowledged that this project was limited by its sample. Thus, these findings are not intended to be extrapolated to all public Social Studies teachers, but rather just to serve as a sample that can provide insight into a topic that still needs extensive research.

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An Investigation of In-class Occupational Education and Its Effects on Student Perception and Interest in the Field of Science.

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The United States' image as a major world power is supported by our continuing advances in the many different realms of science. The sciences penetrate almost every aspect of the important challenge to be a superpower and to remain one of the world's most productive nations. This, in particular, is one reason for the great concern over the emerging statistics showing that U.S. students are lagging behind in science achievement in comparison to their counterparts in many developed countries. The lack of involvement in science among U.S. students is leading to a shortage of native-born scientists and engineers (Gallagher, 1993).

Statistics show that as U.S. students progress through their educational career, they are losing interest and enthusiasm for science at each step along the way. The number of students losing science interest dramatically increases during the high school years and continues to increase on into college (Simpson and Oliver, 1990). The concern then becomes that the U.S. may lose its competitive edge in science and technology (Gallagher, 1993). The focus has become to look at how science is being taught in our public schools and what can be done to decrease the number of students losing interest in science in general and to increasing the number of students pursuing science careers.

A variety of enrichment programs, additions and changes in the school curriculum and pedagogic philosophy are being researched in hopes of discovering how to increase students' science interest. Many themes are emerging from this research, suggesting ways to improve student retention in the sciences. A major reoccurring theme of importance is occupational education (Mitchell 1977, Peterson, Long and Billups, 1999, Shimony, Russon, Ciaccio, Sanders, Rimpici, and Takvorian, 2002).

Review of Literature

Various studies indicate that occupational education is beneficial to high school students in relating education and career, understanding science course registration and maintaining

interest in the field of science (Peterson et al, 1999, Mortimer, 2002). Counselors are relied upon to provide most to the occupational education, but are usually only able to reach a small portion of the students (Mortimer, 2002). Teachers have been shown to play an integral role in influencing students and in increasing students' understanding and interest in their respective subject (Stakes and Mares, 2001). Teachers integrating occupational education into the curriculum may well be the most effective use of career education. In studies where occupational education has been incorporated into the classroom as a part of the curriculum, positive effects have been seen on science achievement and retention (Fouad, 1995, Shimony et al, 2002). Very few investigations have attempted to directly measure increased science interest related to in-class occupational education. This study is an attempt to fill part of that void and the null hypotheses that are proposed in this research are:

1. *The majority of students have had significant occupational education discussions with guidance counselors.*
2. *A majority of those students indicating a strong interest in science will not have had occupational education.*
3. *In-class occupational education is not related to increased student interest in the field of science.*
4. *In-class occupational education is not related to students having higher perceived understanding in science.*
5. *If in-class occupational education causes a self-perceived increase in students science understanding, there will be no relation to perceived increase in science interest.*

Methodology

One hundred students from a middle to lower socioeconomic status, racially diverse public high school in central North Carolina were selected to participate in this study. A twenty-three question anonymous survey was used to investigate occupational education and its effects on student perception and interest in the science field.

Data collected from the surveys was both qualitative and quantitative in nature. Quantitative data was analyzed using descriptive statistics and trends were compared by evaluating percentages for some survey questions. Both Microsoft Excel and SPSS were utilized for statistical analysis. Chi-square tests of independence were used to determine if participants' answers to varying questions were significantly related or independent.

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Qualitative data was organized, analyzed and compared, using Microsoft Excel, to distinguish common trends and then used to supplement the understanding of the quantitative data.

Results and Discussion

The findings of this study support the earlier research (Mitchell,1977; Boyer, 1993) that indicates that students are reluctant to seek out counselors for reasons of occupational education. Only 32% of the students involved in this research indicated that they have ever sought out anyone for career guidance. When they were asked specifically about guidance counselor interactions, only 22% have ever engaged in occupational conversations. With this being true, the first null hypothesis is rejected and the alternative which states that the majority of students have not had significant occupational education discussions with guidance counselors is accepted. Students shared many of the same sentiments in this research that have been expressed in earlier findings (Mortimer et al, 2002) as reasons for not using the school counselor as a better resource. "*They are always too busy*", "*they don't care about us non-honors kids*", and "*my parents help me*" are just a sample of some of the qualitative responses to parts of the survey.

Since most students appear to display a reluctance to visit the counselor, how many of them are actually receiving occupational education in the schools? Fifty seven percent of students in this survey had occupational education brought to them via the classroom. This would seem appropriate since teachers have been documented to be very important factors in directing students toward career paths (Stakes & Mares, 2001). Findings from this research lend even more credibility to the thought that teachers presenting in-class occupational education have the opportunity to increase student interest in the field of science. Seventy two percent of the students in this study, who indicated a very strong interest in science, previously had some form of in-class occupational education. These statistics directly contradict the second null hypothesis, therefore, it is rejected and the alternative which states that a majority of those students indicating a strong interest in science will have had in-class occupational education is accepted.

A chi-square test of independence was used to evaluate occupational education and increased science interest and found that in-class occupational education and science interest are significantly related (x^2(4, N=38)=38.0, p=.05). This comes on the heels of research done by Shimony et al (2002) and Fouad (1995) that recorded the same type of findings. Null hypothesis

three is therefore rejected and the alternative which states that in-class occupational education is related to increased student interest in the field of science, is accepted.

Science understanding is another important concept. Understanding connections (Mitchell, 1977) between school and career are essentially important in science so that students recognize that their educational decisions today have career implications tomorrow. Beyond understanding course and career connections, students must also be able to make informed decisions about the science courses they are taking (Peterson et al, 1999). All but five of the students in this survey gave indications that they had no problem registering for courses. However, the different reasons given for registering for science classes raises some questions. Are students actually aware of the impact of their courses, or are they simply "taking what they are told"? If students aren't accessing the counselors and over 40% of students have had no in-class occupational education, then how are those whom are recommending tracks for these students making sure these recommendations are congruent with the student's career aspirations. It is apparent that understanding related to science and the necessary courses, is important, and that in-class occupational education may assist these difficulties, but do the students perceive occupational education as increasing their science understanding? Yes, according to the results of this study. . When the survey questions concerning in-class occupational education and science understanding were statistically evaluated by a chi-square test of independence, in-class occupational education and increase in understanding was significantly related ($x^2(2, N=38)=38.0, p=.05$).; therefore, the fourth null hypothesis to reject and the alternative which states that in-class occupational education is related to students having higher perceived science understanding is accepted.

Findings from many occupational education studies (Peterson et al, 1999 & Mortimer, 2002, Shimony et al, 2002) imply that better science understanding relates to increased science interest. Students in the present survey were directly asked if they felt that in-class occupational education increased science understanding and interest. Their answers were found to indicate significant relation between science perceived understanding and science interest ($x^2(4, N=38)=38.6, p=.05$). The fifth null hypothesis is therefore rejected and the alternative that states that if in-class occupational educational causes a self-perceived increase in students' science understanding, there will be a relation to perceived increase in science interest is accepted.

Conclusion

This research supports previous findings that suggest that in-class occupational education should be included as a vital part of the science curriculum. It is thought to assist students in drawing connections between education and career, science course registration, science concepts, increasing student understanding of science and thus increasing student interest, and possibly retention in the field of science.

More research needs to be done investigating the relation of occupational education to both student interest and understanding in the field of science. Some limits of this research were relatively small sample size and two of the survey questions that were left blank by most all of the participants. Larger sample size and an extremely well constructed instrument for gathering data would be recommended for further investigation. Thus far in discussion and research, increased science interest has mostly been assumed to predict increased retention in the field. There is a very small amount of research that directly addresses this issue and more research would be suggested to support this assumption.

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But Why?

A Study of High School Mathematics Student's Reasoning Skills With Technology

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Introduction to Reasoning

The National Council of Teachers of Mathematics (NCTM) believes that all students, grades kindergarten through twelfth, "should see reasoning as reasoned and reasonable" (2000, p. 342). At the high school level NCTM states "students should develop an appreciation of mathematical justification in the study of all mathematical context" (2000, p. 342).

In her research of student reasoning capabilities among young children, Russell (1994) compared the ability to reason to a "hammocklike structure in which knots are joined to other knots in an intricate webbing; even if one knot comes undone, the structure does not collapse but still bears weight" (p. 4). At the high school level, reasoning becomes those "outer knots" that make the structure more complex and allow mathematical reasoning abilities to be extended.

Reasoning at any level is better than no reasoning at all. However, as students progress in their mathematical education it is important to ensure that they move from empirical based reasoning to a more abstract form of reasoning. Concrete examples have been found to help facilitate students' reasoning skills, yet educators should expect students to move beyond the empirical evidence of reasoning into a more advanced proof-driven reasoning, especially at the high school level (Cai, 1998). In a study of advanced level mathematical students, Coe and Ruthven (1994) found that very few of the students could extend their mathematical knowledge past the classroom, and that few students could produce intricate reasoning beyond basic empirical reasoning.

Reasoning occurs in many forms and is represented in many forms. Students should recognize when and what to use at appropriate times as their reasoning advances into higher levels. "Inherent in this process [of reasoning] is that students communicate their mathematical knowledge and reasoning in a variety of forms" (Peressini & Webb, 1999, p. 161). Encapsulating many years of research across various ages from young children to collegiate level mathematical

students, Sternberg (1999) concludes that students who achieve high levels of reasoning know when to use appropriate tools and are good time managers with complex problems.

Introducing all the different forms, representations, tools and depths of reasoning creates a diverse reasoning culture. It is recommended that teachers should embrace the diversity of student responses instead of corralling students into a formed answer. Teachers should remain open to various responses and encourage students to refine, revise, and extend their reasoning to achieve higher levels of thinking and reasoning. (Doeer & English, 2003).

Reasoning is complex and involves many ideas and procedures that need to be tied together to develop the sound reasoning to create the intricate webbing. Perhaps if some of the rote calculations of the problem were eliminated by allowing students to use technology as an aid as well as a visualization, this would in turn provide students with an opportunity to think outside the box hence resulting in higher levels of reasoning.

Technology

The National Council of Teachers of Mathematics (2000) believes that "technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning" (p. 24). They go on to say that "when technological tools are available, students can focus on decision making, reflection, reasoning, and problem solving" (NCTM, 2000, p. 24).

How are students' thinking processes altered when they are allowed to use technology? Assessing for understanding in a calculator environment, Beckmann, Senk, and Thompson (1999) found that when allowed to use graphing calculators on a test the focus of the student was shifted from computing to conceptualizing the problem. On the other hand, Cohen and Kim (1992) found in their study that students who used calculators when the chance was offered, did not necessarily have higher test scores. In fact, they found that "inappropriate use of calculators rather than lack of mathematics ability may have been an important contributing factor [to lower scores]" (p. 318).

Technology offers new windows in mathematics to be opened. Patzer and Zhang (2001) found that when implemented effectively on behalf of the teacher, technology allowed students to construct personal ideas, test, and receive immediate feedback allowing them to extend their thinking. Similarly, Healy and Hoyles (1999) found students who did not use technology did not

make mathematical connections or generalizations, yet those who did use technology were able to visualize the connections and extend to a broader context.

Reasoning and Technology

NCTM supports firm foundations in both technology and reasoning skills among students 9-12. Moreover they state "as students use calculators or computers in the classroom, the teacher has an opportunity to observe the students and to focus in on their thinking" (p. 26).

More specifically, Edwards, Graham, Heid, Hollebrands, and Iseri (2001) studied students' reasoning and justifications in a technologically rich environment and found "technologically rich mathematical environments can open new ways for students to extend and capitalize on their mathematical reasoning" (p. 212). Concluding their study, they state that "becoming acquainted with the nature of mathematical tasks and classroom discourse that fosters higher-level reasoning in technologically rich mathematics classrooms also empowers teachers" (p. 218).

The question explored in this study was whether students integrate technology and reasoning to achieve at a higher level? Can technology aid students in their reasoning abilities?

Methodology

The subjects of this study were students from two Algebra Two Honors classes of a large suburban high school. Each student was asked two questions both of which could be done without the aid of technology but both requiring reasoning steps to be shown. On day one of the study, class one answered question A while class two answered question B. Both classes were permitted to use technology on day one. The following day technology was prohibited and students answered the opposite question. Upon completion of the two questions, each was scored for reasoning and numerical answers and a chi-squared test of significance was preformed.

Reasoning Results and Discussion

Upon completion of the data collection, student responses were scored. Table one gives a breakdown of the reasoning scores and technology usage.

The results of this study were statistically insignificant

	Correct Reasoning	Incorrect Reasoning	Totals
Technology Allowed	12	38	50
Technology **Not** Allowed	18	34	52
Totals	30	72	(102)

Table 1. Reasoning (Numbers of Students)

(χ^2 (2, N=102) = 0.391, p=0.53). There is no reason to believe reasoning was affected by technology use among the students.

Results were also analyzed on complexity of the reasoning shown and the type of reasoning shown. The results of this study showed a variety of reasoning skills and methods. Some students showed flow charts, while others showed systematic steps, still others showed paragraph form.

Moreover, the variety of reasoning was also analyzed in accordance with technology usage. Question One was a two-step question, the first requiring mathematical skills and reasoning, while the second part required only reasoning. Yet upon analysis, of those that were allowed to use technology, 5 out of 24 (21%) answered with only numerical answers showing no reasoning at all on part two. Contrasting with those that were not allowed to use technology on the same question, only 1 out of 26 (4%) answered with only numerical answers. In addition, those that were allowed to use technology tended to show more numerical calculations while those that were not allowed to use technology showed more words and "reasoning" thoughts.

Numerical Results

The data from this study was also scored based on numerical results. Table Two displays the raw data scores for numerical answers broken down by technology usage.

As done with the reasoning scores, a Chi-Squared test of significance was performed to see if

	Correct Numerical Answer	Incorrect Numerical Answer	Totals
Technology Allowed	34	16	50
Technology **Not** Allowed	35	17	52
Totals	69	33	(102)

Table 2. Numerical (Numbers of Students)

calculators use was related to numerical scores. These results were statistically insignificant (χ^2 (2, N=102) = 0.006, p=0.94), showing that students' ability to produce correct answers was independent of technology usage. This result mirrors results of Cohen and Kim (1992) who found that calculators (technology) did not provide the assistance and higher test scores for students.

Conclusion and Implementation

Perhaps the most valuable information from this study was gained from analyzing the individual responses and viewing the range of responses from different students. This diversity in

responses has been studied before and many conclusions state that it should be embraced. Students should be encouraged to describe reasoning processes. Many methods are acceptable to show correct reasoning. However, Coe and Ruthven (1994) argue with their results that students at some point should be encouraged to move beyond an empirical reasoning and into theoretical and applied reasoning.

Although it was hypothesized in this study that technology (mainly graphing calculators) would aid students in producing reasoning and perhaps more in-depth reasoning, these results were not found to be statistically significant. A similar insignificant result was found for whether calculators enhanced students' procedural knowledge. The data that forms this study is a small sample, and while it is representative of various Algebra Two students, all students were from the same high school and had the same teacher for Algebra Two. More comprehensive studies of the question of whether technology enhances reasoning in a mathematics classroom are recommended.

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The Effect of Content Based Writing on Students' Achievement in Pre-Calculus

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In the wake of current accountability and assessment trends, it is important for mathematics teachers to search for, and implement the most effective methods of instruction. Trends in mathematics education have varied over the years but recent research indicates that the use of writing within the content area may improve student understanding and achievement.

Review of Literature

Teaching for Understanding

Mathematics education and its reform has been the subject of much debate and research. At the heart of this movement is the goal of teaching for understanding. But what is understanding? Perkins and Blythe (1994) define understanding as, "…a matter of being able to do a variety of thought-demanding things with a topic, like explaining, finding evidence and examples, generalizing, applying, analogizing, and representing the topic in a new way" (p.6). Students need to generalize and carry out applications and work through their understanding in a thoughtful way with feedback and support.

The National Council of Teachers of Mathematics (NCTM) has set forth standards for teachers to follow. One of these standards concerns communication within the mathematics classroom. NCTM (2000) states that, "Communication is an essential part of mathematics education. It is a way of sharing ideas and clarifying understanding. Through communication, ideas become objects of reflection, refinement, discussion and amendment" (p.60). Through communication students are able to build meaning and permanence for ideas.

Talking and Writing

Much has been found to support the link between talking and writing within the mathematics classroom. Whitin and Whitin (2000) argue that developing a personal voice in mathematics is one of the most important goals for students and that writing and talking are powerful tools to help students reach this goal. Since for most children talking comes more naturally than writing, it is helpful to allow students to talk about topics before they write

(Huinker & Laughlin, 1996). Through dialogue with others, students are able to negotiate and clarify their ideas before they put them on paper.

<u>Writing and Its Benefits</u>

When discussing communication within the mathematics classroom it is helpful to narrow the discussion to writing. Writing in math allows students to merge their thinking because they must reflect upon their work and clarify their thoughts about the concepts encountered during lessons. Countryman (1992) offers the following,

> Knowing mathematics is doing mathematics… I believe that to learn
> mathematics students must construct it for themselves. They can only do
> that by discussing, using, describing, investigating, predicting, in short by
> being active in the world. Writing is an ideal activity for such a process
> (p.2).

Writing offers a way for students to personalize their knowledge (Mett, 1989). It is also a way for teachers to cater to the needs of students with various learning styles (Elliot, 1996). According to Pugalee (1997) writing offers a more comprehensive look at students' mental process as they work through mathematical problems and it is a valuable tool for developing metacognitve skills. "Writing helps build thinking skills for mathematics students as they become accustomed to reflecting and synthesizing as parts of a normal sequence involved in communicating about mathematics (Pugalee, 1997, p.308).

<u>Effects on Student Understanding and Achievement</u>

As some teachers make efforts to use writing strategies within their classrooms, it is important to look specifically at its effects on students' learning and achievement to convince others of its stated benefits.   In response to this need, several researchers have looked at the implementation of writing and its benefits in different areas and levels of mathematics.

Kasperek (1996) implemented an integrated writing curriculum in an Algebra II course. In the study, one group was taught using the integrated technique. A pretest, a midtest, and a posttest, were then administered. Students in the experimental (writing) group showed growth but results were not shown to be statistically significant. Kasperek (1996) explains that the data collected indicated that a longer study might produce more significant results.

 Use of writing in upper level mathematics is scarce but some research has been done on the effect of writing in upper level high school and introductory college math classes. Masingila

and Prus-Wisiowska (1996) used writing as a means of developing and assessing mathematical understanding of Calculus concepts. They found that writing allowed them insight into students understanding and they were able to effectively offer feedback to students.

Previous research and thought about effective mathematics teaching indicate that communication and writing can have positive effects on student learning. This study hypothesizes that student understanding is enhanced by the use of writing within the mathematics classroom and seeks to determine the effect of content based writing assignments on the conceptual knowledge and understanding of eleventh and twelfth grade students enrolled in Pre-Calculus.

Methodology

This study was conducted in a large suburban high school. The subjects involved were a convenient sample from two sections of a Pre-Calculus course taught by the same teacher. Sample groups, made up of eleventh and twelfth grade students, were predetermined by the high school and the two intact classes involved in the study where similar.

The context of this study was an instructional unit on trigonometry in the regular curriculum. One group was taught the relevant material in a conventional manner. The other group was taught the same material, with the addition of supplementary writing assignments. Writing assignments where given during class on each day of the instructional unit, and each assignment was related to the material covered in class.

At the conclusion of the unit both groups where given identical tests. The writing group's tests were then scored and compared to the control group's scores. Adjustments were made for student performance on a previous class test using an analysis of covariance (ANCOVA).

Results

The treatment (writing) group had a sample size of twenty seven (n=27), and the control (no writing) group had a sample size of twenty two (n=22). The mean scores and the adjusted mean scores for the treatment and control groups are contained in Table 1.

Table 1.

Means of Sample Groups

Group	N	Score		Covariate	
		mean	sd	mean	sd
Treatment	27	78.3	8.982	83.89	13.571
Control	22	80.59	10.888	83.09	10.757

ANCOVA (analysis of covariance) revealed no significant difference between the treatment and control groups (F (1,46)=1.074, p>05). This suggests that there is no difference between the achievement of students who encountered writing as part of their mathematics instruction and the achievement of those students who did not. These results can be found in Table 2.

Table 2.

ANCOVA Results

Source	df	F	eta	sig.
Group	1	1.074	0.023	0.305

Conclusions

This study was undertaken to examine whether the use of writing in the mathematics classroom would affect student achievement. Based upon previous research on the integration of writing, talking and communication skills within mathematics instruction, it was hypothesized that the use of writing activities would have a positive effect on student achievement in Pre-Calculus. Although the results of this study do not support this hypothesis, the value of such instructional techniques within the mathematics classroom cannot be dismissed.

The results of this study may have been affected by several factors outside of the researcher's control. The time allowed for the completion of this study was limited and constrained the length and depth of the treatment. If students had been exposed to writing for a longer period of time, perhaps results would have been significant. This is consistent with

previous research on integrated writing curricula which also indicates that longer studies tend to produce more significant results (Kasperek, 1996).

Another factor that affected this study was the fact that the treatment was implemented by a regular classroom teacher who was not the researcher. The cooperating teacher had other factors, not related to this study, influencing the nature of the instruction. The writing assignments and the degree to which they were emphasized and/or valued in the classroom were dependent upon the teacher. Therefore any effects this may have had on the results of the study were beyond the control of the researcher.

The key to effective mathematics teaching lies in finding ways for students to make connections and process the information they encounter in their mathematics courses. This study and others have worked to offer insight to the use of writing as a means of teaching and learning. Still, much more thought and research needs to be done on the use of writing in the classroom. Teachers and researchers must continue to work together to find the most effective strategies for all students.

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Teacher-Student Interaction Before and Immediately After the Bell

in Secondary English Classrooms

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Introduction

There are many different ways to begin an English class. A teacher might demand that all students be seated in their seats before the bell and get into the subject right away. Some teachers might take their time chatting with their students and/or letting the students chat with each other. Some teachers might even have a specific startup activity before they delve into the core content of the class. Is there any importance to this beginning few moments of class? Does it matter what teachers do during that small frame of time?

The topic of classroom startup procedures and its importance continues to be studied because it has a profound impact on the rest of the class period and its productivity. The purpose of this study is to examine what kinds of student behavior patterns occur when teachers begin their classes with various types of personal interactions, if any, with their students.

Review of Literature

Teacher-student interaction is an integral part of high school classrooms, because it builds rapport between the teacher and students. When students feel that they can respect and trust their teacher, they tend to not only perform better academically but also grow more confident in themselves. Many studies have shown the importance of positive teacher-student relationships.

In his study, Burke (1996) has found that multi-year teacher-student relationships yield positive results for both teachers and students. When teachers stay with their students for multiple years, they are better able to understand their students, therefore, better able to aid them in their needs. A group of teachers who taught the same students for three years have reported that they were able to "use more positive approaches to classroom management," know more about their students; the "students were better able to see themselves as important members of a group, to feel pride in that group, and to feel pride in the school as a whole" (p. 360). In

Worcester, Massachusetts and West Bloomfield Minnesota, the two schools that tried the multi-year teacher/student relationship approach has observed that these teachers were "the happiest people in [the] building," and the students to "step back into the classrooms with ease" (p. 362). This study shows that the relationship between the teacher and the students is something that is not to be ignored, but encouraged and nurtured.

More specifically, Pomeroy (1999) interviewed 33 excluded high school students (meaning, students that had to be permanently removed from regular schools and attend Behavioral Support Services Center) and found that students weigh their relationships with their teachers as one of the greatest factors for their behavioral problems. The teacher behaviors that the students regarded as antagonistic and humiliating included "shouting, telling them to 'shut up', responding sarcastically, putting young people down and name-calling" (p. 469). These behaviors often made the students feel devalued and disliked. One of the most consistent and common grievances was that "teachers do not listen to students" (p. 470), making students feel as if their point of view is not valuable enough to be heard.

Though most of the interviewees in Pomeroy's study experienced negative interactions with teachers, majority also spoke of positive qualities possessed by some teachers. These included sense of humor, "willingness to provide students with the help and attention they need in order to learn," (p. 472) and effective disciplinary skills. This study concludes that the ideal model of the teacher-student relationship revolves around dialogue and "mutually respectful treatment between individuals in the working relationship" (p. 480).

As the vice president of a high school in Huntington Beach, Shore (1998) observed that personalization was the most important factor in keeping the students engaged in school. The students used to throw out the school rules and regulations when they were handed to them on a piece of paper. However, when the administrators decided to talk to the students in their English classes about the rules and regulations, the students better understood the rules and actually followed them. Students were in a personal environment where their comments and questions could be heard.

Pigford (2001) refers to the lack of teacher interest in developing personal relationships with their students as *the* problem in today's schools. Many discipline problems and lack of student interest in the classroom can be improved by personal interactions between the teachers and the students. Pigford suggests that greeting students as they enter the classroom, being warm

and friendly, and expressing high expectations will help improve the classroom environment. When students develop a positive relationship with their teacher, they feel inclined to pay attention and to perform satisfactorily in that particular teacher's class.

Like Pigford, Belton (1997) also observed that "A teacher must not only patrol the classroom, but must also have an excellent relationship with the students" (p.67). If the students have a positive relationship with their teacher, they are more likely to try harder in order to please the teacher. Teachers will also encounter less cheating if they are liked and respected by their students.

The topic of teacher-student relationship and its importance continues to be studied because, as research shows, it has a profound impact on the students. The purpose of this study is to examine what kinds of student behavior patterns occur when teachers begin their classes with various types of personal interactions with their students, if any, and whether these interactions (or lack thereof) influence the rest of the class period and its productivity.

Methodology

The subjects in this study were four English teachers in a suburban high school located in North Carolina. Each teacher was observed ten times over the course of a two-month period. In order to secure confidentiality and anonymity, each teacher was assigned a letter (A-D) for identification purposes. The researcher took detailed field notes on what each teacher was doing before the bell as students shuffled into the classroom. For the remainder of the class period, the researcher recorded the kinds of behaviors and attitudes displayed by the students by observing their verbal expressions, facial expressions, and body language.

Results and Conclusions

All four teachers observed in this study had their own unique way of interacting with their students. Though the four teachers differed from one another, they each showed varying effects of their choice of interaction with their students.

Teacher A's (T-A) utmost concern seemed to be focused on student-engagement. For two minutes before the bell, T-A was absent from the classroom for 40% of the observation time period. T-A was not in the room even as the bell rang for 30% of the time during the first minute of class. However, T-A's rapport with the students was positive and the students responded well to T-A. The students found their teacher's use of sarcasm and humor entertaining and interactive. The first 15 minutes into class after the bell did not change T-A's method of interaction with the

students. The students participated in discussion with interest and enthusiasm. They were more eager to voice their views and opinions, interpretations and understandings of the text. T-A's response to the students, such as "Yes! Great job," "Keep going," "That's an excellent observation," seemed to invite more participation and engagement from the students.

Unlike teacher A, teacher B's (T-B) interaction with the students were more traditional. T-B was always in the room before the bell during the time of the researcher's observation. As the students shuffled in, they approached T-B standing at the desk or podium to ask various questions regarding class materials or even to simply exchange casual conversation. T-B devoted the beginning minutes of class to review work for 40% of the time during the observation period. For 30% of the time, T-B's beginning minutes were devoted to homework: checking for completion, going over answers to a vocabulary worksheets, or having volunteers read aloud their writing assignments. For the 20% of the time, T-B posed open-ended, critical thinking questions relating to the literature they were reading or discussing in class; the remaining 10% of the time, T-B assigned a creative opening activity to help students remember their new vocabulary words before the exam. By the students' demeanor and attitude toward the teacher, the researcher noticed that T-B also had a positive rapport with the students.

Unlike the first two teachers, teacher C (T-C) was very task-driven. There was little or no interaction between T-C and the students prior to the bell. For 80% of the observation period, T-C did not interact with the students as they shuffled into the classroom. For 70% of the observation period, T-C took care of housekeeping procedures, such as setting dates for make-up work, clarifying due dates, or explaining grades for the first five to ten minutes of class before beginning the day's lesson. For the other 30% of the time, T-C delved right into the class material by either prompting discussions about the previous readings or giving them an in-class vocabulary, writing, or reading assignment. Students responded well to T-C's authoritative and prescriptive methods of teaching, and they seemed to possess a healthy rapport regardless of T-C's stern demeanors.

Of all the teachers, teacher D's (T-D) observation results were the most fascinating. Before the bell, T-D was always inside the classroom, or outside of the door of the classroom, greeting students as they entered. As students came in one by one, T-D offered casual conversation, to which students responded positively. After the bell, 90% of T-D's observed classes began with an opening activity that was interesting and engaging. However, regardless of

the engaging opening activities, T-D inevitably lost most of the students' interest after about 20-30 minutes into the class period. Students' disinterest was displayed by talking, doing completely unrelated/unassigned activities, or simply going to sleep.

Looking over the results of the research, the observer noticed that each teacher's method of interaction (or lack thereof) was unique to their own personalities. Teacher A and teacher B's methods seem to denote that personal teacher-student interaction in the beginning moments of class is a crucial element in engaging students. Through their interactions, these two teachers seemed to have successfully earned the respect and fondness of their students, thus allowing them to reach their students on various levels.

On the other hand, though Teacher D's interaction with the students and the engaging opening activities seemed infallible, both measures failed. Teacher D's rapport with the students seemed to be based on fondness, but lacked respect. Students did not seem to feel the need or desire to please the teacher in terms of their performance, or feel it a formality to fulfill their role as students for this teacher. It seems that a stable balance is needed between teacher C and teacher D. Teacher D was too activity-driven that often, the purpose of the activities seemed to get lost in its execution. Teacher C lacked any interaction with the students, but had earned their respect through stern and authoritative demeanor. Perhaps a stabilized balance between these two teachers would yield positive student-responses as seen in teacher A and B. Further suggestions for this research include longer period of observation and interviewing students to get a feel for their attitudes toward their teachers' efforts, or lack thereof, to interact with them.

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Effective Teaching Strategies in Foreign Language Classes on the Block

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Introduction and Review of Literature

Teachers, parents and administrators are constantly looking for innovative approaches to improve and reform education. The lack of cohesion during the traditional school day (North Carolina Department of Instruction, 1996), the shortened amount of time used for instruction (Cusick, 1973; Seifert & Beck, 1984), and the increase in graduation requirements (Rettig & Canady, 2001) have all contributed to educational reform focused on class time and school schedules. School boards and central office policymakers on the East Coast, in the Midwest, and in the West are turning to alternative scheduling approaches to address these issues (Johannessen & Lorenz, 2001). One alternative model is the block schedule which lengthens class periods to between 80 and 100 minutes permitting students to complete four year-long courses each semester. In addition, block scheduling decreases the divisions in the school day and gives teachers additional time to get to know their students and then execute diverse teaching strategies accordingly (Wisconsin Association of Foreign Language Teachers, 1995).

Despite the benefits lauded as a result of this new schedule, foreign language teachers are voicing concerns (Wallinger, 2000). The most widespread block schedule format reduces total instruction time (Trenta & Newman, 2002; Wallinger, 2000). In addition, scheduling sequential foreign language classes is difficult, and according to Queen, Algozzine and Isenhour (1999), students may wait two years or more between the first level of instruction and the second, which makes it difficult to attain proficiency. Finally, researchers have recognized that it is imperative for teachers to vary their teaching techniques to prevent student boredom and decreased energy levels that are often the result of longer class periods (North Carolina Department of Public Instruction, 1996; Robbins, 2000).

The success of block scheduling rests with each individual foreign language teacher's ability to rise above these issues (Wisconsin Association of Foreign Language Teachers, 1995; Rettig & Canady, 2001). Teachers in a block schedule should continue to model instruction

based on the five goal areas of the *Standards for Foreign Language Learning* (ACTFL, 1999), using the proficiency approach summarized in the *ACTFL Performance Guidelines for K-12 Learners* (ACTFL, 1998) so that students are able to develop proficiency in an effective manner. Therefore, the purpose of this study is: 1) to investigate how foreign language teachers on a block schedule plan and carry out instruction and 2) to determine the most effective instructional practices teachers use in a standards-based and performance-based program on the block.

Methodology

To determine the most effective teaching strategies used in the foreign language program on the block schedule, the researcher pursued the study in two parts. Seven high school foreign language teachers who currently teach Levels I – IV of French, Latin, or Spanish in public schools on the block schedule in a small city in the Southeastern United States were randomly selected to participate. In the first part of the study, each teacher was interviewed in the month of October 2003. The purpose of the interview was to elicit teachers' opinions on the advantages and disadvantages and the challenges and opportunities that present themselves when teaching on a block schedule. In addition, the researcher was interested in each teacher's instructional planning and the teaching and assessment strategies used by teachers who teach during an extended class period. The second part of the study involved teacher observations. The researcher observed each teacher during one class period to witness firsthand the teacher's instructional and assessment strategies. The observation was used to substantiate the information provided by the teacher during the interview process. All of the information collected was reviewed and synthesized to identify recurring themes related to effective foreign language teaching strategies.

Results and Conclusion

The following analysis synthesizes information and opinions acquired during participant interviews and observations. The teachers interviewed varied between less than five years to twenty years of teaching experience. Experience teaching on a block schedule varied from one year to eleven years, but the majority of the teachers have taught on the block and the traditional schedule. Each school observed has identical block schedules that are a slight variation of the 4/4 semester plan in which each course meets daily and lasts ninety minutes. All teachers teach three class periods each semester and have one planning period.

Four of the seven teachers prefer teaching on the block while one teacher prefers teaching on the traditional schedule. The reasons behind these preferences varied, and teachers were asked to affirm or negate perceived advantages and disadvantages of the block schedule. The majority of the teachers do not agree with studies that show a reduction in discipline problems as a result of the block schedule. Five of the seven teachers do not feel that the block schedule improves student attendance nor do they agree with studies that note a decrease in time teachers devote to administrative tasks. Six of the seven teachers interviewed agreed that the block schedule reduces stress for students and teachers. Four of the seven teachers feel that the block schedule creates additional time for students to develop communication ability, though five teachers feel that this schedule does not lead to increased foreign language proficiency. Three teachers went even further to say that they have difficulty developing students' proficiency on the block schedule. Two other teachers stated that this results from the underlying issue of scheduling sequential foreign languages. All teachers interviewed concurred that the scheduling of foreign language classes is the greatest disadvantage on the block. All teachers deal with issues that arise as a result of non-sequential scheduling of classes, and four of the seven teachers deal with issues involving the availability of foreign language classes. Each teacher admitted to spending anywhere from three to six weeks at the beginning of the semester reviewing as a result of non-sequential scheduling of foreign language classes.

In order to create a successful classroom where students develop proficiency based on the *Performance Guidelines for K-12 Learners* (ACTFL, 1998) and the five goals of the *Standards for Foreign Language Learning* (ACTFL, 1999), teachers are continuously examining and strategizing new ways to best carry out instruction during the ninety minute class period. All teachers recognized that students have difficulty focusing attention on one task for the duration of the period, and the researcher observed the most effective instructional practices were those that broke the class down into several different blocks of time. The number of activities teachers said they planned for one period varied from three to as many as eight activities, while the number of activities actually carried out in class was typically on the lower end of the spectrum. Teachers appeared to include a mix of interactive and independent activities during the ninety minutes as suggested by the Wisconsin Association of Foreign Language Teachers (1995).

Teachers acknowledged the importance of integrating diverse teaching strategies as they target various aspects of language acquisition, and they all consider instructional flexibility to be

the primary advantage of the block schedule. Teachers were asked about specific strategies used
to develop foreign language proficiency and meet the needs of diverse learners. When asked
whether or not they use the strategies given in the below list, the number of affirmative responses
was as follows:

Strategy	# of Teachers	Strategy	# of Teachers
Art/drawing activities	7	Group and/or Pair Work	7
Graphs / charts / semantic maps	5	Authentic L2 activities	5
Visuals / réalia	7	Physical movement activities (Total Physical Response)	7
Virtual tours, internet, WebQuests	3	Independent reading / writing	7
Reflections/ journals	3	Student / Group presentations	7
Games / music	7	Note taking	7
Teacher lecture	6		

Teachers further identify the most effective strategies as the use of white boards, learning
stations, creative activities in which learning is personalized, Total Physical Response activities,
and group/pair work. The least effective strategy identified was teacher lecture. It was apparent
to the researcher that each teacher knew her students well enough to determine what types of
activities worked best in her class, perhaps as a result of the extended class period.

　　　Additional class time and use of varied activities led teachers to use more comprehensive
and alternative assessment strategies. Most teachers formally assess their students once a week.
Several teachers mentioned the ability to administer comprehensive assessments that measure
listening comprehension, vocabulary, grammar and writing all in one period as a result of the
longer class period. Additionally, teachers actively focus on language proficiency as a result of
the lengthened class period and work to assess students' oral proficiency both informally and
formally. All teachers are actively working toward increasing student proficiency as outlined in
the *Performance Guidelines for K-12 Learners* (ACTFL, 1998).

　　　Research points out the many advantages and disadvantages for foreign language
education on the block schedule. Perhaps the most beneficial aspect of the block schedule is the
opportunity and freedom it provides teachers. With the longer class period, teachers have time to
vary their instruction and include activities that are not feasible during a shorter period. This
creates opportunities for teachers to include additional cultural activities and to link the
classroom to the target community where students have the chance to use the foreign language.

After completing the teacher interviews and observations, this researcher concludes that it is ultimately up to each individual teacher to adapt teaching strategies and techniques to take advantage of the positive aspects of the block schedule and surmount the negative aspects of the block schedule. All teachers should be continually looking for innovative ways to vary instructional practices. Foreign language teachers on the block schedule, however, would benefit from periodic professional development workshops to aid them in adapting to teach on the block. Foreign language teachers should voice concerns so that administrators and school policymakers are made fully aware of the challenges they face in helping students attain proficiency in the target language as a result of non-sequential scheduling of classes. In an effort to validate the importance of continuous, articulated language programs, the researcher believes that additional long-term research should be undertaken to quantify the impact that the non-sequential scheduling of classes has on proficiency development. With this data, it is hopeful that school administrators and school policymakers will respond and implement the block schedule in a manner that is beneficial to the foreign language program.

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Methods High School English Teachers Use to Correct Student Responses

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Introduction

Questions are a vital part of high school English classes; however, students do not always answer them correctly. Students often give wrong responses that prompt the teacher to correct them for the purposes of generating an understanding of the right answer and preventing repeated mistakes. While teachers often use a variety of corrective methods to address incorrect responses, certain methods are more effective than others.

This study attempts to identify the methods teachers use to correct wrong responses in honors and regular classrooms as well as identify which methods appear to improve student learning and which methods hinder it.

Review of Literature

One of the most commonly explored topics in educational research is the relationship between teacher behavior and student achievement. The phrase "teacher behavior" refers to the different methods teachers employ in class every day, whether they are conscious of it or not. In a paper aptly titled "Teacher Effects," Good (1984) identifies "reacting to student responses" as one of the five most potentially influential methods. The findings that Good (1984) and other researchers have reported also suggest that even the most astute teachers are at risk of inhibiting their students' achievement because of certain behaviors they might involuntarily exhibit. Out of the five teacher behaviors Good (1984) identifies, perhaps the most important methods to consider are the ones that explicitly involve student participation: questioning the students and reacting to student responses.

While teachers can positively interact with students by asking good questions, they can also promote student achievement by modeling and encouraging proper ways to respond to questions raised in the classroom. Sankey (1999) suggests that, regardless of the methods teachers use to respond, they should take measures to make sure their classrooms are safe places for both students and teachers to be wrong and learn from their errors.

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While Rosenshine (1976) suggests that extensive interaction between teachers and their students promotes student achievement, the act of questioning and responding is sure to generate a surplus of incorrect or unwanted responses. It is important to note the many different types of student mistakes that often occur in classes. Students might answer a question incorrectly, mispronounce a word, misread a selection, misuse a word or phrase, or give an incorrect interpretation of an issue addressed in class.

Since conflicting research exists on the best course of action for teachers to take when addressing students' incorrect responses, this study attempts to identify the methods teachers use to tackle student mistakes as well as distinguish the most effective methods to use in order to promote student achievement.

Methodology

The participants of this study consisted of four English teachers and their students at one high school in the Winston-Salem/Forsyth County school system. Three of the teachers were male and one was female, and they taught World, American and British literature to remedial, regular, honors and seminar students. The teachers were chosen to participate in the study by the Education Department at Wake Forest University and will be identified throughout the study as Teacher A, Teacher B, Teacher C, and Teacher D.

In an attempt to identify the most effective methods for addressing students' incorrect responses, the researcher observed the interactions between teachers and students for a total of thirty-six hours over a period of two months in the fall of 2003. In this research study, the term "incorrect responses" denotes wrong answers, mispronunciations of words, misuse of words and phrases, and incorrect analyses of issues being discussed in class. All of the incorrect responses identified in this study were also related to the specific lesson being taught during the class period. The researcher observed randomly chosen classes and used field notes and charts to collect and organize the data. Every time a student gave an incorrect response, the researcher noted: 1) the type of mistake, 2) the teacher's reaction to the incorrect response, and 3) the student's subsequent reaction to the teacher's response.

The teacher responses to incorrect responses fit into one of the following categories: chastisement, providing the student with clues to arrive at the right answer, re-asking or rephrasing the question, or immediately deferring the question to another student. The student's reaction to the teacher's response fit into one of the following categories: visible embarrassment

or discomfort, visible or verbal gratitude, revision of the incorrect response, or ignoring the teacher's comments altogether.

After the data was collected, the researcher organized the data using three separate tables: methods and reactions grouped by class level, methods and reactions grouped by teacher, and the combined totals of methods and reactions for all classes. Using the collected data, the researcher attempted to identify two things: 1) Which methods were used most often in each class level, and 2) Which methods consistently produced the most positive student reactions (i.e. gratitude and revision).

Results and Conclusions

The participants in the study used a variety of methods to correct student responses in their classrooms. Some teachers displayed a dominant method of correction without regard to the type of incorrect response or class level, while others varied their methods of correction according to the level of the class and/or the type of miscue. While some teachers corrected incorrect responses by utilizing a combination of all the methods (i.e. chastisement, prodding/clues, re-asking the question, and deferring to another student), others tended to favor a method and used it to continuously address incorrect responses in all of their classes. The range of student reactions was also extensive, and certain methods of correction routinely produced distinct student reactions. The data collected in the study indicated that certain methods were responsible for producing positive student reactions, whereas other methods continuously generated negative student reactions.

The data indicated that there were dominant methods of correction utilized in each of the class levels, regardless of the teacher and the type of incorrect response. In Practical English classes, the most common method used was prodding (i.e. providing the student with clues to arrive at the correct response). In Regular English classes, the most common corrective method was re-asking/rephrasing the question. As in the other class levels, the most common type of incorrect response in Honors and Seminar English classes was the wrong answer, and the predominant method used to address these incorrect responses was to defer the question to another student.

While each of the participants in this study used a variety of methods to correct student responses, only Teachers A and C displayed a dominant method of correction in all of their classes. Teacher A re-asked or rephrased the question in 44% of his/her responses to student

errors. He/she used this method most often in all of his/her classes, regardless of the level he/she was teaching. Teacher C also favored a corrective method in all of his/her classes and prodded his/her students with verbal and visual clues 55% of the time. Teachers C and D continuously used an assortment of methods in their classes.

When analyzing the data from all of the class levels, the researcher found that certain methods teachers utilized to address incorrect responses produced distinct student reactions. Not surprisingly, chastisement by the teacher most often resulted in the student's physical embarrassment or discomfort. On the other hand, students were most grateful when the teachers prodded them towards the correct response by giving them verbal and visual clues.
The corrective method utilized by the teacher also had an effect on the students' subsequent treatment of his or her incorrect response. The method that most often resulted in the student's revision of his or her response was re-asking or rephrasing the question. On the other hand, deferring to another student was the method that most often resulted in the student ignoring the teacher and making no attempt to adjust his or her incorrect response.

In this study, the most positive student responses generated were student gratitude and revision, while the most negative responses were embarrassment and student failure to adjust his or her answers. Chart 1 depicts the percentages of corrective methods that resulted in positive student responses.

Chart 1

Methods that Generated Positive Responses

- Chastisement
- Prodding/Clues
- Re-Asking
- Deferring

13% 3% 46% 38%
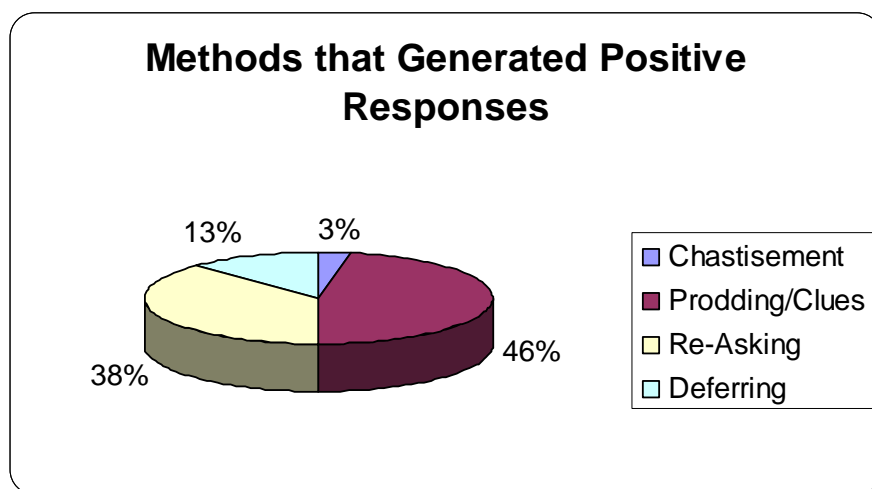
The method that generated a combination of the two positive student responses with the most regularity was the prodding method. Conversely, chastisement was the method that resulted in student embarrassment and disregard of the correct answer with the most frequency.

Although further research is needed in order to draw a sound conclusion about which corrective methods are most effective in high school English classrooms, this study found a relationship between the prodding method and positive student response. By providing the students with clues to arrive at the correct answer, the students were able to feel that they were capable of arriving at the correct response without feeling like failures in front of their peers. However, when the teacher singled the student out to ridicule him or to make disparaging remarks, the student was less likely to revise his answer or respond to the next question that was asked. Teachers who empowered their students by helping them attain the correct response tended to have more student participation; whereas teachers who chastised their students for their incorrect responses tended to have less student participation.

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The Relationship between Students' Educational Background and

Environmental Attitude

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Introduction

Concern for the natural environment is not an innate attribute. Sensitivity towards the environment is developed through nurturing role models, education and life experiences. Due to our dynamic society, our planet is in need of an environmentally aware and concerned populace to make important informed decisions about the future of our natural resources. There is a concern that the education system may not be reaching all students with environmental literacy to create positive environmental attitudes.

This study intends to examine the relationship between students' science educational background and environmental attitude. This research will survey environmental attitudes of high school students and investigate relationships concerning science educational background and demographic features, including age, grade level and gender.

Review of Literature

Several researchers have shown links between science education and environmental attitude, concern, and awareness. Sivek's (2002) research showed that developing concern for the environment, that is positive environmental attitudes, have been shown to be related to education, role models, experiences with nature, locus of control, and personality. In a study of environmental sensitivity of Wisconsin high school students, Sivek (2002) defined environmental sensitivity (ES) as "having empathy for or relating to other living things or ecosystems" (p.157). During focus group interviews of environmentally sensitive students Sivek (2002) found that infuences from the outdoors and role models are important factors for environmental sensitivity.

During a short term environmental program, Eagles and Demare (1999) performed a study with 6th grade students in Canada that attended a week long residential environmental camp called Sunship Earth. The participants were surveyed on their moral and ecological

attitudes before and after the program. The camp results did not indicate a significant change in the students' attitudes. Although the authors were surprised with this finding, they noted that the students had a moderate level of environmental experience before they began the Sunship Earth program and the program duration was short. Also they noted that families had an influence on attitude. However, unlike Sivek's results, this study also suggested a significant influence from the media on positive environmental attitudes.

Yount and Horton (1992) designed a study to look at the relationship between a university introductory course in environmental science and its effect on environmental attitude of college students. They explored a link between the course material and its use to defend their preset environmental attitudes, which they called attitude defensibility. The study involved a control group who were enrolled in a physical science course and an experimental group who enrolled in an introductory environmental science course. Both groups were non-science majors. The study found that there was no significant change in environmental attitude after taking the environmental course, but it did find a significant change in the environmental attitude and the attitude defensibility. The authors conclude that students who synthesize and apply knowledge will be the ones who are more likely to use knowledge in a decision, and to change their attitude.

Concern for the environment was shown to be related to several factors including education, role models, experiences with nature, outside influences and personality. Several authors noted that previous environmental experience influenced positive environmental attitude of children and college students. College biology majors were found to be more environmentally sensitive than engineering or business majors, indicating that type of education has an influence on environmental attitude. Science majors also tended to be more concerned and more active in environmental issues. The goal of this research was to further investigate the relationship of science education to students' environmental attitude. A quantitative survey and qualitative questions on environmental attitudes of high school students are used to investigate relationships between environmental attitude and science educational background, and demographic features, including age, grade level and gender.

Methodology

The sample population was forty-one out of a possible fifty-eight high school students in grades 9-11. The students were chosen from a local North Carolina high school with a population of 650 students including grades nine to twelve. Two classes of Introduction to

Biology and one Earth Science class participated in the study. A fifteen question confidential paper and pencil Environmental Attitude survey and five open-ended questions were administered to the sample group. The study consisted of the quantitative survey and qualitative questions answered by the whole research group and qualitative interviews with nine chosen students. Basic descriptive statistics and correlations were performed on the data using SPSS. Qualitative data was coded and categorized.

Results

The mean of the fifteen survey questions was 38.7, which indicated a favorable environmental attitude of the sample. Sixty-two percent of the students had taken 2 sciences courses including earth science and biology. Most were females in the sample and 34% were freshman with 66% sophomores and juniors.

Favorable environmental attitudes were indicated on statements such as the following: " Special habitats should be set aside for endangered species. Laws regarding water quality should be stricter. Hunting and fishing are important environmental management activities." Unfavorable environmental attitudes were indicated on statements such as the following: "Animals that provide meat for people are the most important animals to protect. Farmers should be held responsible for any damages to the environment. Management of wildlife populations should be left to nature."

Correlations were preformed on the data. No significant correlation was found between number of science courses taken and environmental attitude. Only one significant correlation was found between two coded questions, which examined the relationship of having a person that influenced their environmental concerns and items that increased their environmental concern. The Pearson correlation coefficient was -.363 with a significance level of 0.23. This indicated that the more items they listed that increased their concern for the environment the more likely that they had a person that influenced their environmental concern.

Qualitative results indicated that 81% of the students were concerned about the environment. Their concerns included pollution (air, water), animals, ozone layer, trash, trees, and rain forest. Those not concerned either did not care or were not informed. Interviews yielded similar results, but also included concern about burning trees. When asked if science courses had increased their environmental concerns 48% indicated they had and 53% said they had not. Earth science and biology were courses that had increased their concerns as one student

said, "Earth Science, because it has taught me a lot of stuff that people do to the world and the animals." Most of the negative responses were due to other things that increased their concerns like animals, TV or pollution. Only 49% of the students indicated that a person was responsible for increasing their concern. The majority of those indicated that a teacher was responsible. One student wrote that, "Teachers (increased my concern), by teaching me the things I needed to know to take care of the environment." In addition items like zoos, museums, books and nature TV shows increased the students' environmental concern.

Discussion

There was no significant correlation found between the number of science courses and environmental attitude. A correlation was found between things and people that increased their environmental concern. The more items they listed that increased their concern for the environment the more likely they were to have had a person that influenced their environmental concern. Teachers combined with outside influences may have an impact on a student's environmental concern. The mean survey score indicated that the students have a favorable environmental attitude. Qualitative results indicated that most students were concerned about the environment and that a teacher increased their concern. Concerns included pollution, animals, trash, trees and the ozone layer.

The small sample size may have affected the results. The sample group was relatively homogenous, consisting of a majority of women that were in 10th grade, who had only two science courses in high school. This group may have impacted the results. For further research it is suggested that a larger more diverse group of 9th-12th graders be sampled. Also comparison of groups from different schools with more diversity may yield different results. In addition, individual, instead of group interviews may yield better data.

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Table 1. Correlations

Correlations

		sumS1-15	# of Courses	Q4	Things that increased concern	Things that decreased concern
sumS1-15	Pearson Correlation	1	-.057	.127	.022	-.053
	Sig. (2-tailed)	.	.724	.441	.889	.753
	N	41	41	39	41	38
# of Courses	Pearson Correlation	-.057	1	-.231	.174	.201
	Sig. (2-tailed)	.724	.	.158	.277	.226
	N	41	41	39	41	38
Q4	Pearson Correlation	.127	-.231	1	-.363*	.122
	Sig. (2-tailed)	.441	.158	.	.023	.478
	N	39	39	39	39	36
Things that increased concern	Pearson Correlation	.022	.174	-.363*	1	-.226
	Sig. (2-tailed)	.889	.277	.023	.	.173
	N	41	41	39	41	38
Things that decreased concern	Pearson Correlation	-.053	.201	.122	-.226	1
	Sig. (2-tailed)	.753	.226	.478	.173	.
	N	38	38	36	38	38

*· Correlation is significant at the 0.05 level (2-tailed).

Figure 1. Favorable Environmental Attitudes

S1: Special habitats should be set aside for endangered species

S2: Laws regarding water quality should be stricter.
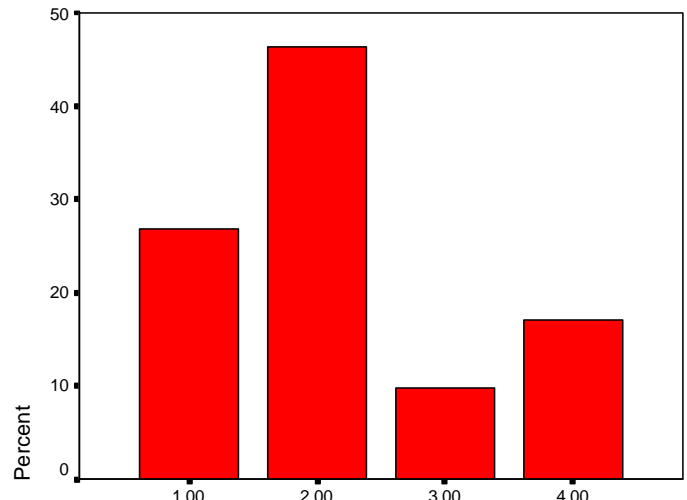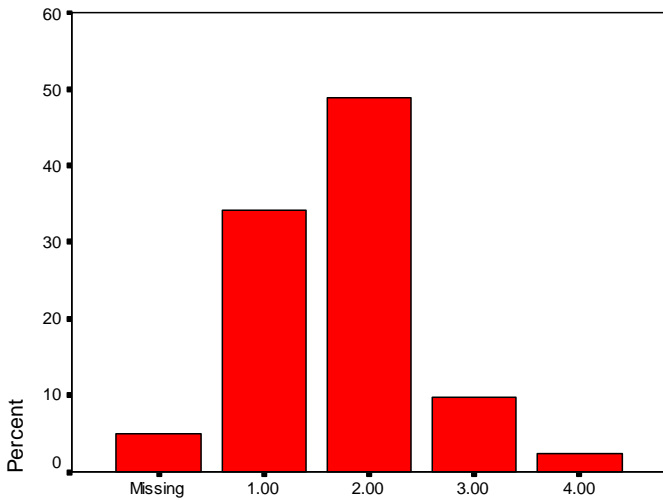
S1   Responses

S2   Responses

1= strongly agree 2= agree 3 = neither 4= disagree

The Effect of Ability Grouping on Student Attitudes and Achievement in Science Labs

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Introduction

With the growing reliance on cooperative learning in classroom instruction, there is a need for assessment of the effectiveness of grouping strategies. Recent studies are starting to uncover the complexities of cooperative learning and are evaluating the impact that students' differing abilities have on the overall achievement of students in the group. It has been shown that who a students works with influences how much a student gains from cooperative learning (Carter, 1994). If students are grouped homogeneously, there is the fear that low-ability students will be denied opportunities to learn and be unmotivated to learn because of peer, personal, and teacher expectations of poor performance. On the other hand, there is a concern that it is "unethical to retard" the achievement of high-ability students by assigning them to heterogeneous groups where they might spend their time instructing other group members rather than learning information they did not already know (Lou, Abrami, Spence, Poulsen, Chambers & d'Apollonia, 1996). Because of this, it is important to know how to group students most effectively. Therefore, the purpose of this study is to determine which grouping method produces the highest achievement for the greatest number of students in the laboratory setting while also examining the emotional and social aspects of grouping.

Review of Literature

There have been many research studies done on how to group students for maximum academic achievement, but the results are conflicting. In a meta-analysis by Lou et al. (1996), homogeneous and heterogeneous ability grouping had a differential effect on student learning. In general, homogeneous ability groups achieved more than heterogeneous ability groups in studies that directly compared the two. However, the benefit of being grouped homogeneously is not the same for all ability levels. Low-ability students actually learned significantly more in heterogeneous groups, while medium-ability students benefited significantly more in homogeneous groups. Group composition did not make a significant difference for high-ability

students. Overall, there is no evidence in the meta-analysis (Lou et al., 1996) that one form of grouping is uniformly superior for promoting the achievement of all students.

It is not just the academic achievement aspect of cooperative learning that must be considered; one must also take into account the impact it has on students' self-esteem, attitude towards school and their fellow classmates. Teachers have to be mindful of what effect each grouping conditions will have on a student. Feldhusen and Moon (1992) argue that heterogeneous grouping of high-achieving students leads to lowered motivation as well as poorer attitudes toward school. Homogeneously grouping high-ability students, however, may damage their social or emotional well-being. Melser (1999) measured the self-esteem of gifted students in homogeneous groups and compared them to those working in heterogeneous groups. The self-esteem ratings of the two groups differed significantly when compared. While the gifted students working in heterogeneous groups had an increase in self-esteem, the gifted students who worked cooperatively with homogeneous groups had a decrease in self-esteem. Further, Shields (1995) found that students of all abilities exhibited greater academic self-confidence in heterogeneous groups.

Methodology

The subjects were students from three intact honors biology classes of one teacher from a high school in North Carolina. The cooperating teacher assigned ability levels to the students as either high, middle, or low according to their first quarter grades. In order to study the effects of ability grouping, students were purposefully placed into either homogeneous or heterogeneous groups based on ability. All of the students completed two labs, one in a homogeneous group and the other in a heterogeneous group. All students completed the labs in the same order, but approximately half the students were grouped heterogeneously and the other half were grouped homogeneously for the first lab and then the grouping types were switched for the next lab. After completion of each lab, each group turned in one lab report. Each student then took a posttest measuring their mastery of the concept presented by the lab and completed an attitudinal survey consisting of Likert scale questions. After completion of both labs and posttests, students completed a final open-ended survey about their grouping experiences. The group lab reports were used to assess group achievement and the posttests were used to assess individual achievement.

Results and Conclusions

A Univariate Analysis of Variance (Factorial ANOVA) showed that there was a significant interaction between the level of students and the type of grouping which affected the group report grade (F=4.750, p<0.05). The Scheffé post hoc was used to examine multiple comparisons in order to determine which means were significantly different from which other means. The Scheffé post hoc analysis revealed that the scores of the different ability levels were not equal (F=4.224, p<0.05). The scores of high ability (mean=92.92) and low ability students (mean=76.24) in homogeneous groups were significantly different when compared to their scores in heterogeneous groups (mean=87.28), p=0.012, p=0.025, respectively. High ability students did significantly better on their lab reports than the low ability students in a homogeneous setting, p=0.029 (alpha=0.05).

The interaction between ability level and grouping did not have a significant effect on quiz grades (F=1.334, p>0.05); however, the level of the student did have a significant effect, p=0.0 (alpha=0.05). As shown in Table 1, the quiz scores increased as the ability level of the students increased. This appears to be especially evident when students are grouped heterogeneously. However, the method of grouping did not have a significant effect on individual quiz grades for students of any ability although the difference is closest to being significant for the middle ability students.

Table 1. Individual Quiz Grades

	Homogeneous		Heterogeneous		*t* value	p value (alpha=0.05)
	Mean Quiz Grade	n =	Mean Quiz Grade	n =		
High ability	79.64	25	**81.28**	25	-0.453	0.652
Middle ability	77.92	24	**69.65**	20	1.978	0.055
Low ability	65.32	22	**59.16**	25	1.082	0.285
Average of All Students	74.62	71	70.06	70	1.561	0.121

The interaction of grouping and ability level did have a significant effect on student's attitude (F=0.016, p<0.05). A paired samples T-test revealed that there was a significant difference in the attitudes of high ability students in heterogeneous and homogeneous groups (*t* value=2.442, p=0.019). There was not a significant difference in the attitudes of middle and low ability students in heterogeneous or homogeneous settings. There is, however, a slight preference for heterogeneous grouping by the middle and low ability students as seen in Table 2.

Table 2. Results from Attitudinal Surveys

	Homogeneous		Heterogeneous		t value	p value (alpha=0.05)
	Mean Score	n =	Mean Score	n =		
High ability	**44.86**	21	**42.52**	24	2.442	**0.019**
Middle ability	42.22	23	44.79	19	-1.223	0.216
Low ability	43.22	18	44.74	19	-0.689	0.494
Average of all students	*43.43*	62	*42.84*	62	0.620	*0.538*

The open-ended survey that students completed after finishing both labs provided further information about the students' grouping preferences that may not have been evident in the responses from the attitudinal survey. High ability students had a significant preference for working in homogeneous groups (chi-square=12.250, p=0.00) whereas, middle and low ability students preferred working in heterogeneous groups though it was not significant (chi-square=2.571, p= 0.109 for both). Table 3 illustrates the reasons students had for preferring one grouping situation over the other.

Table 3. *Comments Classified by Grouping Preferences*

	Homogeneous	Heterogeneous
High ability	"Everyone contributed and we all worked together in this group."	"I did not like the homogeneous group because one girl just took over thinking she was the only smart girl in the group."
Middle ability	"Everyone did their part instead of someone doing all the work."	"Because our group stayed on task and we were all committed to the lab project. The people in my group gave their idea and opinions more than in the [homogeneous] group."
Low ability	"I had more fun and learned more working with someone who was more like me, I felt uncomfortable in the other group."	"Because they were smarter people."

When asked "Do you usually prefer to work with students of your same ability?" the responses of the lower ability students were surprising given their answers to the other questions. Just over half of low and middle ability said that they preferred to work with students of their same ability even though on the other questions in the survey the majority of the same students indicated that they preferred working with their heterogeneous groups. For example, one students said, "I fell more comfortable working [with people of my same ability] so I don't have to feel like I am the only one who doesn't understand." Other low and middle ability students responded by saying that, "The communication is better and we have similar expectations," and "We can better relate and all work equally, but if one person is smarter, than that person does all of the work." The students seem to value their comfort and ability to participate in the group

work over potential academic achievement. This is important because if the students do not feel comfortable in the heterogeneous groups then they will probably distance themselves which would detract from the learning potential.

High ability students had a significant preference to work with members of their same ability level (chi-square=13.762, p=0.000). They responded that it would be beneficial for them to work with other high ability students so they can learn from them. One of the high ability students also said that they would prefer to work with other students of their same ability so they do not feel like the entire lab is their responsibility simply because they are the smart student. High ability students do not appear to mind helping lower ability students, but they just want an equal opportunity to learn more as well.

The primary question of this research was the effect of ability grouping on students' achievement and their attitude towards group work. Because the results of this study show that neither homogeneous nor heterogeneous ability grouping is uniformly superior for promoting the achievement of all students, it may be more important to consider the social and emotional effects of different types of grouping.

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Does the Integration of Concept Map Activities Affect Student Achievement?

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For over a decade teachers have been encouraged to initiate meaningful learning in their students (Hiebert & Carpenter, 1992; National Council of Teachers of Mathematics [NCTM], 2002). Meaningful learning in mathematics is the process of understanding concepts and how they relate to one another rather than rote memorization of facts and mathematical procedures (Kinchin & Hay, 2000). Teachers promote student discovery of connections between concepts and use of writing to reflect and clarify the concepts that they have discovered (Bolte, 1999; NCTM, 2000; van Boxtel et. al., 2002).

One means of promoting meaningful learning is the use of concept maps. "A *concept map* is a diagram representing the conceptual structure of a subject discipline as a graph in which nodes represent concepts and connections represent cognitive links between them," (McGowen & Tall, 1999, p. 2). It is a graphical representation of concepts and how the learner perceives their relationship with prior knowledge. Currently, there are various methods to construct a concept map. There are hierarchical or chain, (Novak & Gowin, 1984), spoke or spider, and mobile or net representations of concept maps (Kinchin, 2000). Every type of concept map is a valid way to graphically represent the relationships of concepts. Concept maps involve the learners in the learning process. Learners are able to physically represent their cognitive structure so that the learner and others may evaluate what they really know (Novak & Gowin, 1984). This provides the learners with another mode in which to communicate understanding.

Studies have shown that concept maps cultivate and assess understanding and produce meaningful learning. Most research done on concept maps has been within the field of science, since concept maps are a convenient fit into science curriculum. Little research has been done in the area of mathematics. Mathematics is a subject in which concepts build upon other concepts both vertically and laterally. Concept maps can allow students to not only see the connections between concepts in a specific content area but also with other content areas.

Laturno (1994) studied five remedial mathematics courses at a community college where most of the students were minorities or were from low socioeconomic status families. Concept map activities were integrated in the courses. The students' concept maps were graded and interviews were also conducted afterwards. She concluded that concept maps did indeed assist in academic progress. Similarly, Williams (1998) studied 28 students in a Calculus I course at a major university. Each student had completed the course and then was asked to provide a concept map containing all the major terms and concepts covered in the course. The concept maps were then assessed. She found that students' concept maps correlated with the students' level of understanding of the material.

Research has concentrated on usefulness and cognitive development. While these are all practical, higher achievement is another possible outcome from implementation of concept map activities into classrooms. This study was designed to examine the effect of concept map activities on student achievement, specifically in the high school mathematics classroom.

Methodology

Using quantitative causal-comparative methods, two Algebra 2 classes from a local high school were selected by convenience to participate in this study. Both classes had approximately the same race, gender, ability levels, and socioeconomic status. The content that they covered was part of their regular curriculum.

A unit on polynomial functions was taught to one class integrating concept maps in the lessons while the other class was taught without using any concept maps. Both groups were taught by the regular teacher. The test at the end of the unit was used to assess achievement. The test was made by the teacher as she usually designs her tests, with two additional open-ended application problems. A rubric was designed to score the open-ended questions. The rubric was viewed by a panel of experts in the subject area in order to validate it.

The two classes covered the same material through similar methods except that one used concept maps and the other did not. SPSS was used to calculate a t-test statistic to compare the two groups on their level of achievement on the application section of the test.

Results and Conclusions

When the research started there were twenty-one students in the first group and twenty-four students in the second group. The second group lost a student during the data collection due to behavioral issues, so the total number of students who participated in this study was forty-four.

The two groups were asked to answer two questions. These questions were application problems dealing with rational functions. Students in each group had as much time as they needed to complete the questions, the same resources, and were not able to seek help from any human source. Students were asked to show their work on their paper for grading purposes.

Both groups answered the two questions. The scoring of each question was out of a total of three points. Each question contained two parts. A student received a score of three when they were able to give correct answers for both parts. The scores for the questions were then added together to get each students' total score. The rubric used to grade the questions is shown below.

3	Gave both correct answers to problem.
2	Gave one correct answer to problem.
1	Could set up the problem correctly.
0	Could not solve or set up problem correctly.

The treatment group scored on average 2.9 points higher than the control group. This indicates that the treatment group's achievement was significantly greater than that of the control group. This was the expected because the group with concept map activities integrated into the lessons had a better understanding on how to set up the equations and how to find the answers. The control group had many scores where the students were not able set up the problems. The table below shows the results of the t-test.

Table 1: Results for Questions						
	N	Mean	Std. Deviation	t	df	Sig.
Group 1 (Treatment)	21	3.5268	0.87287	10.330	42	.000
Group 2 (Control)	23	0.6087	0.98807			

Mean Scores
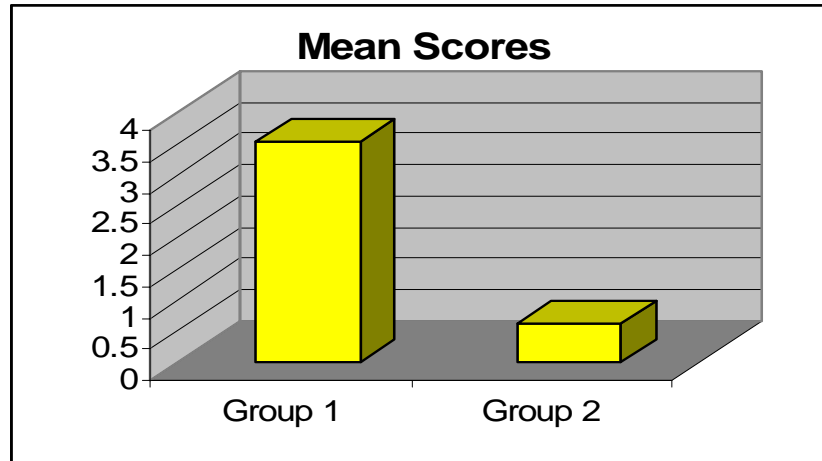
The t statistic was t(42) = 10.330, ρ = .000. So there was a significant difference between to the two groups' means. Therefore concept map activities did have a positive effect on student achievement. Both groups also followed a pattern in what areas of the questions they got correct or got wrong. It was observed that the group with the concept map activities scored higher on certain concepts within the questions.

On question 1, many students got one of the correct answers but not both. The answer was a parabola and at a certain y value there were two x values. The control students generally could not set up the problems as well. The most common error was putting the given information in the wrong parts of the given equation. Another area that both groups struggled with was maximums and minimums. The treatment students could generally give the maximum but not the minimum. The control students rarely gave either.

In answering the questions, most of the students chose to use the graphing calculator. Unfortunately, this led to many students not showing any of their work. In turn, this may have had an effect on the scoring. If the answer given for the question was wrong and they did not show any work, they may have lost points they could have been given for setting up the problem correctly.

Preliminarily, the two classes were judged by the teacher to be at approximately the same ability level. One limitation to this study was that the two classes were not pretested to determine their exact variance in ability or achievement. Still, t-test results showed a significant difference between the average scores of the treatment and control groups (t(42) = 10.330, p = .000). The group with the concept maps integrated, scored considerably better on both questions.

Another limitation to this study was the size of the sample. The sample of two intact classes was too small to generalize to the entire high school mathematics classroom population. A larger sample would provide more data so that results could be more generalizable.

The results indicate that concept maps integrated into high school mathematics lessons had a positive effect on student achievement. The students who used concept maps set up the problems with better accuracy, showed a better understanding of maximums, and scored much higher overall. It is reasonable to conclude that concept maps may provide a conceptual framework for understanding many mathematical concepts. Therefore, concept maps should be further explored as an applicable tool for the mathematics classroom.

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Methods Used in Classroom Management: Are They Effective?

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The purpose of this study is to determine the effectiveness of various classroom management methods employed by teachers with a particular focus on the interaction of teachers and pupils following disruptive behavior.

This research is based on Wragg's (1995) study and examines post-disruption methods of classroom management employed by secondary social studies teachers. The teachers' responses to classroom disruptions and their effect on subsequent student behavior will be analyzed. Where as Wraggs's study was conducted in England with students aged 5-12 in 1995, this research will be done in secondary school classrooms in a Piedmont North Carolina School District.

Review of Literature

According to the Gallup/Phi Delta Kappa Polls of Public Attitudes Towards the Public Schools, discipline was cited over the prior decade as the first or second most serious problem (Elam, 1996).

When observing a number of classroom disruptions and the teacher responses to those disruptions Wragg (1995) found that the most common student offenses were talking, inappropriate use of materials, and inappropriate movement. The most common four responses to these misbehaviors were ordering, reprimanding, involving in work and naming the student/students.

In respect to class size's relationship to student behavior, Achilles (1998) states that "students from smaller classes have far better behavior (as measured by discipline referrals)" which results in "less time and money being spent on discipline". He also points to studies done which find that crowding changed behavior in negative ways. Consequently, since there is less crowding in smaller classes, less negative behavior will occur. Achilles (1999) also points out that teachers have an easier time managing their classrooms with fewer students which allows them to devote more of their time to teaching (Bohrnstedt and Stecher, (1999)). Ellis (2003)

goes further concluding that discipline problems in smaller classes are minimized because teachers can "keep a better eye" on the students. Due to teachers being able to know their students better and attend to problems immediately, a reduction in discipline problems was reported by teachers that taught in smaller classes (Halbach, Ehrle, Zahorik, Molnar, 2001). Furthermore, fewer discipline problems result in the emotional strain decreasing for the teacher (Ellis, 2003). A study on schools in Fairfax County Virginia found that smaller class sizes are more effective for students from low socio-economic status backgrounds. Achilles & Finn (2000) concur with this statement and also found that members of minority groups greatly benefit from class size reductions as well.

Methodology

The two central queries of this study were which classroom management techniques teachers use when their students misbehave, and were these methods effective? Three of the eight schools in a Southeastern school district were randomly selected and a list of social studies teachers in each of those schools was obtained. Every other teacher on that list (n=16) was sent a letter requesting their participation in the study. When only two subjects responded to the letter, a follow-up e-mail message was sent to the non-respondents.

The subjects consisted of two males and four females, two of whom had been teaching for less than five years and two for less than ten. The remaining two teachers had various levels of experience, but all had been teaching for at least ten years. Five of the six were certified to teach, the sixth was in the process of receiving a certified teaching license. Two of the six had a Master's degree.

Observation was chosen over interviews because it was the researcher's belief that more accurate results would be obtained by observing action rather than having subjects report on their actions after having time for reflection upon the various classroom situations. Data was collected during the observation of six classes from the two schools on a regular schedule of 45 minute periods and five and one-third classes for the school on a block schedule. Before the beginning of each class a seating chart was drawn up and each desk was numbered. During the class, the occurrences of certain student misbehaviors along with the response of the teacher were recorded. When the whole class was disruptive, it was recorded on the empty space on the paper. After the student misbehavior was recorded, the response of the teacher was recorded beside it.

Results

       This section will discuss the three most frequent disruptions in detail along with the four most popular teacher responses.
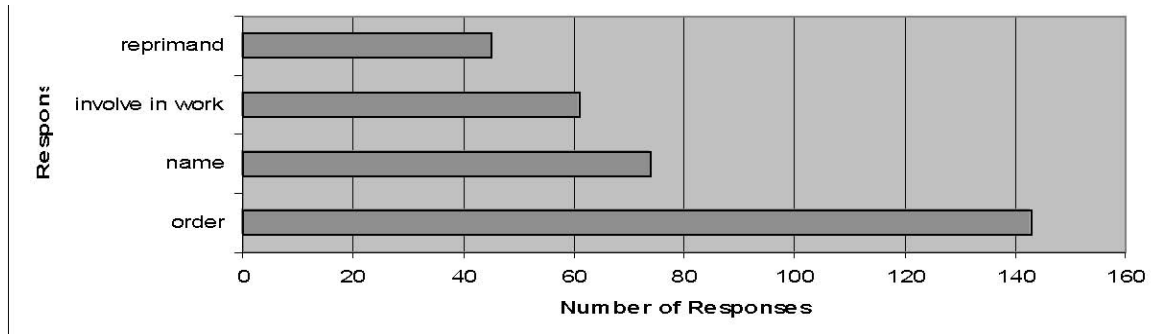
Figure 1. The four most frequently used responses to misbehavior, reprimanding (n=45), involving the students in work (n=61), naming (n=74), and ordering (n=143).

       Out of the 359 student behaviors that teachers responded to, talking, inappropriate movement, and inappropriate use of materials accounted for 338 disruptions or 94% of the total. Talking was by far the most common disruption, occurring 82% (n=295) of the time. Much less so were disruptions caused by inappropriate student movement (8%, n=28) and inappropriate use of materials (4%, n=15).

       When teachers responded to students talking, they 'ordered' their students to cease 37% of the instances (n=92), tried to 'involve the students' in work 21% of the time (n=53), 'reprimanded' the pupils 14% (n=35), and 'named' the student/students 13% (n=34). In response to talking, 'naming' was the most effective response (n=25), with 'reprimanding' (n=13), 'ordering' (n=47), and 'involving in work' (n=17) following in decreasing order of effectiveness. 'Naming' the student resulted in preventing further instances of talking 74% of the time. 'Reprimanding' and 'ordering' the students only worked about half of the time, 52% and 51% respectively, while 'involving the students in work' was the least effective at 32%.

       With regards to inappropriate movement, the four most frequently used methods used can be seen as effective. The results are illustrated in Figure 4. 'Ordering' was again used most frequently with 'reprimanding', 'naming', and 'involving the students in work' following in descending order of use. 'Ordering' was used 16 times, while 'reprimanding', 'naming', and 'involving the students in work' was used 6, 2, and 1 time respectively. The misbehavior of inappropriate movement was only repeated twice. Both times an 'order' was given first. In response to the second infraction, the students were 'reprimanded' and 'ordered' once again.

Following the second instance, the inappropriate movement did not occur again for the rest of the class period. Where the other responses were effective 100% of the time, 'ordering' was ineffective 13% (n=2 out of n=16) of instances.

Teacher response to inappropriate use of materials occurred 15 times in the 30 hours of observation. 'Ordering' and 'naming' accounted for 73% of the responses while other methods made up the remaining 27% of teacher reactions. 'Naming' the students (n=2) resulted in the cessation of misbehavior every time. However, 'ordering' the students to cease was not as effective. Out of the nine times used, an additional 'order' was used four times or 44%.

The effectiveness of the three most common disruptions and the four most common responses were also studied in relation to class size and individual teacher.

Conclusions

From the data, it is suggested that teachers 'name' students when reacting to talking, inappropriate movement, and inappropriate use of materials. Overall, 'ordering' was not a good method to use with honors, elective, or standard level classes. 'Reprimanding' was not effective in the two classes where it was used (standard and elective), which leads to the conclusion that it should not be used at all. 'Involving in work' was the least effective in the honors classes and effective about half of the time in the regular and elective classes   Therefore, if one is going to attempt to 'involve their students in work' as a form of discipline, it should be done less so in honors classes and according to the research will be more effective in standard and elective level classes.

In conclusion, this research supports 'naming' as the most effective method of classroom management. Based on these findings, teachers should refrain from using 'ordering' and 'reprimanding' in their classrooms and should not attempt to merely 'involve students in work' to halt disruptions. This is not to say that these methods can never be used effectively, but that they should be used sparingly and complementarily with 'naming'. During the study the same classroom management methods were used despite varied educational backgrounds, ages, and experience of the teachers. Future research should be completed on why the same methods are used even when education and experience vary.

This research has provided some basic guidelines on the successful management of certain types of classrooms. Consequently, it has raised even more questions about how and why

certain methods are used. After further research when these answers are found, one of the most

important facets of our teaching, classroom management, can be better understood.

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A Study of the Relationship between Religious Beliefs and Confidence in the Theory of Evolution in High School Students and Their Science Teachers'Culturally Sensitive Instructional Responses

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Some teachers might agree that it is a serious detriment to students that the theory of evolution, which is considered by them to be extremely important to developing an understanding of biology, is avoided in many classrooms and in many districts because it is perceived as negating a view favoring the involvement of God or a supreme being in the creation of life on earth. Some students may operate with this either-or mentality, thinking that because they hold certain religious beliefs the theory of scientific evolution is automatically wrong or vice-versa. This either-or mentality, however, is not representative of some religious teachings. Official support for the validity of the theory of evolution from religious groups has been found for Presbyterians, Methodists, Catholics and Baptists (Ostrander, 2003; Polkinghorne, 2003; United Methodist Church, 2003; Pope John Paul II, 1997). Similarly, there is much support from the scientific community for the validity of religious teachings (Staver, 2003; Silman, 2003).

Literature Review

The relationship between religious beliefs and the confidence one has in the theory of evolution has been assessed by many researchers using university undergraduate students of diverse, non-science backgrounds (Bishop & Anderson, 1990; Brem, Ranney & Schindel, 2002; Demastes, Settlage, & Good, 1995; Sinatra, Southerland, McConaughy & Demastes, 2003; Anderson, Fisher & Norman, 2002). It has been determined that, if an undergraduate, one's religious belief is inversely related to one's confidence in the theory of evolution (Bishop et al., 1990; Brem et al., 2002; Dagher & BouJaoude, 1997; Demastes et al., 1995; Lawson & Worsnop, 1992; Sinatra et al., 2003), meaning that students who classify themselves as having a larger strength of adherence to religious teachings are less likely to have confidence in the theory of evolution. Further, in university undergraduates, no relationship exists between knowledge of the

theory of evolution and confidence in animal or human evolution (Brem et al., 2002; Sinatra et al., 2003). The Sinatra et al. (2003) study also revealed that students who were identified as evolutionists had more exposure to "pro-evolution" messages, while creationists reported approximately equal exposure to "pro"- and "anti-evolution" messages. The students in the Brem et al. (2002) study tended to agree that the theory of evolution has serious social negative consequences, including a reduced sense of purpose (78% creationists, 75% evolutionists) and decreased spirituality (83% for both), and agreed that both evolution and creationism should be presented in the science classroom. No studies have been conducted that measure all of the above criteria for high school students.

Methodology

The subjects were 9th and 10th grade students who were enrolled in ESL, standard or honors general biology classes and 12th graders enrolled in environmental science classes. The subjects represented a range of ages, races, religious backgrounds and socioeconomic classes, at a public high school in central North Carolina. The students and their three classroom teachers were selected by convenience and appropriateness of course content, as scientific evolution is included in both types of courses surveyed.

Out of approximately 325 students who were given parental informed consent letters, 164 were returned, three of which refused permission. The rate of return in the environmental science classes was 60% and the rate of return for the other two sets of biology classes were 57% and 36%.

Seventeen Likert scale items were developed for the survey, which also included one religious identification question that asked students to share their religious affiliation and denomination and four free response items. A five-question interview protocol was developed to use with the science teachers of the high school students being surveyed. The protocol was designed to document the teachers' previous instruction in the theory of evolution, to determine whether the teachers felt that religious beliefs should or can be addressed in the classroom, and to collect teachers' suggestions for ways that the topic of evolution could be taught in a way that is sensitive to religious beliefs held by students.

Permission to conduct the study was obtained by the researcher's Institutional Review Board, the school district and the school principal. Permission from the teacher subjects, students, and their parents was obtained by informed consent and assent documents.

Results were analyzed using SPSS to determine Pearson correlations between strength of religious belief and responses to the 16 other Likert scale items on the survey. Percentages of students reporting agreement, uncertainty and disagreement with the statements were reported and qualitative data for the teachers and students were analyzed for frequencies and trends.

Results

Hypothesis: There is no relationship between a student's strength of religious belief and his/her self declared and measured knowledge of the theory of evolution.				
Survey Item	Pearson correlation	% agree	% unsure	% disagree
I am very knowledgeable about the theory of evolution.	0.024	45.3	32.3	22.4
	% providing a scientifically accurate response			
How do you define evolution?	38.1% (57.1% of least religious students; 33.3% of most religious students)			

Hypothesis: There is no relationship between a student's strength of religious belief and his/her confidence in the theory of evolution.				
Survey Item	Pearson correlation	% agree	% unsure	% disagree
Humans evolve over time.	-0.179*	77.0	10.0	13.0
Plants and other animals evolve over time.	-0.158*	80.7	8.1	10.6
The earth is over 1 million years old.	-0.076	70.2	19.3	10.6

Hypothesis: There is no relationship between a student's strength of religious belief and his/her opinions about the teaching of evolution and inclusion of religious beliefs in the public school classroom.				
Survey Item	Pearson correlation	% agree	% unsure	% disagree
Creationism should never be taught in public schools.	-0.066*	13.0	10.0	77.0
Understanding evolution is a very important part of understanding biology.	-0.250**	80.7	8.1	10.6
It is important for students to have the opportunity to share and discuss their religious beliefs in science classes when learning about evolution.	.316**	70.2	19.3	10.6
	% advocating inclusion of religious beliefs			
How would you like to see your teacher teach evolution or teach it differently?	38.0% (14.3% of least religious students; 45.8% of most religious students)			

Hypothesis: There is no relationship between a student's strength of religious belief and his/her perceptions of the nature of science and religion.				
Survey Item	Pearson correlation	% agree	% unsure	% disagree
Evolution has been proven.	-0.210*	48.0	30.0	22.0
Religion and evolution can both be correct.	-0.250**	59.0	21.1	19.9
No supreme being(s) has ever played any role in the evolution of life on Earth.	-0.358**	11.2	45.0	44.7
People who are confident in the theory of evolution have decreased spirituality.	0.132	17.4	39.0	42.9
People who are confident in the theory of evolution have a lower sense of purpose in their own lives.	0.127	59.6	13.0	26.7
A religious belief can be a scientific theory.	0.049	9.3	29.8	60.2
	% reconciling religious beliefs and science			
Is there anything else you would like to share concerning this topic?	11.8			

Hypothesis: There is no relationship between a student's strength of religious belief and the pro and anti-evolution messages received from family, friends.				
Survey Item	Pearson correlation	% agree	% unsure	% disagree
My religious identification informs me that evolution is incorrect.	0.231**	26.7	39.1	34.2
My family tends to show confidence in the theory of evolution.	-0.136	33.6	32.9	33.5
My friends tend to show confidence in the theory of evolution.	-0.133	33.5	37.3	29.2
	% referencing God or a supreme being			
How do you define creationism?	36.0 (14.3% of least religious students; 45.8% of most religious students)			

The greatest number of students surveyed were nondenominational Christians (28%) followed by Baptists (21%) and atheists/agnostics (9%). Overall, 66% of students surveyed considered themselves to be religious, while 12% were unsure and 22% did not.

Discussion

Overall, the study has reported misconceptions about the nature of science, and mainly that students do not understand the difference between the nature of a scientific theory and a religious belief. However, it has shown that students are perceptive of some aspects of the nature of science, such as its lack of association with larger world-views and its ability to coexist with religious beliefs.

The study has also reported a great deal of controversy surrounding the issue of evolution, as students have insufficient knowledge as to their religious group, family and friends'

confidence levels in the theory of evolution, perhaps due to avoidance of this subject by the parties cited.

From the study, it can be concluded that there is a lack of knowledge of the theory of evolution among high school students, and this may or may not be due to their teachers' presentation of evolutionary concepts in science classes.

Lastly, this study has reported that there is a high value that students place on being able to air and have their religious beliefs respected in the science classroom, which is matched by their teachers' hesitation in two-thirds of the cases in suggesting that this dialogue occur in their own classroom. However, the teachers participating in the survey did make suggestions for teaching evolution in a way that is sensitive to religious beliefs held by the students, mainly by addressing the issues surrounding the nature of science and the nature of religion, and assuring students that they do not have to be mutually exclusive.

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Oral Proficiency and Error Correction in the High School Spanish Program

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Introduction

The proficiency approach has become the most widely used approach to foreign language instruction in the United States as the need for language-proficient citizens has become increasingly essential (Shrum & Glisan, 2000). Proficiency in a foreign language refers to the level of communication ability one has in both oral and written communication. The amount of exposure to the foreign language over time corresponds to the level of proficiency one is able to attain. The proficiency approach emphasizes language usage that is contextualized, that is, language practice that focuses on meaningful communication needs (Curtain & Pesola, 1994). An important aspect of proficiency-oriented instruction is the use of grammar for communication. In order to help students develop proficiency, foreign language teachers should focus attention on accuracy of language usage. As foreign language teachers formally assess students' language development, it is necessary to pay close attention to oral error correction (Shrum & Glisan, 2000). That is, at what points during instruction should teachers correct students' errors, what are the specific errors they should correct, and which strategies should they use to correct them?

Review of Literature

In 1996, the American Council on the Teaching of Foreign Languages (ACTFL) introduced the *Standards for Foreign Language Learning* (ACTFL, 1996). The Standards are the expectations for content knowledge in a foreign language that students should develop in grades K-12. The standards outline five interconnected goal areas: Communications, Cultures, Connections, Comparisons, and Communities.

Grammar is an important aspect of the Communications Goal because one cannot communicate effectively without accuracy of grammar usage. When speaking orally in a foreign language, the student experiences correction of errors by the teacher on a continual basis. There are many variables that determine when error correction should be used. In a study about the effects of error correction, Dekeyser (1993) found that error correction does not lead to an

"across-the-board improvement" (p.510) of target language achievement.   On the contrary, he found that error correction interacts with individual learner differences such as previous achievement, extrinsic motivation, and anxiety. Mings (1993) found in a study about the effectiveness of error correction that 1) learners make different types of errors, 2) errors do not all produce identical consequences, 3) errors originate from a variety of causes, and 4) learner errors serve a useful purpose in language development. This research supports the need for foreign language teachers to pay attention to the individual characteristics of each learner in instruction.

According to Lyster and Ranta (1997), once a foreign language teacher understands at what point to correct errors and the specific errors to correct, he/she should focus on the frequency of correction and specific strategies to use. It is generally accepted that students should not be interrupted during speech production and that oral errors should be corrected when a student is finished speaking (Hadley, 1993; Bragger, 1985). At this point, there are several effective strategies that the teacher can use. A study done by Lyster and Ranta (1997) determined six different oral error correction strategies: explicit correction (teacher provides correct form), recasts (teacher reformulates utterance minus the error), clarification requests (teacher indicates the need for clarification, metalinguistic feedback (teacher comments without providing correct form), elicitation (ask students to reformulate response) and repetition (teacher repeats, in isolation, the student's error). Lyster and Ranta's research shows that the recast strategy is used most often, but this strategy also proves to be the least effective because it does not require the student to attempt to correct his/her own error. Four of the other six methods of feedback require the student to generate a correct answer. Lyster and Ranta found that the four types of feedback that allow for negotiation of meaning (elicitation, metalinguistic feedback, clarification requests and repetition) were more likely to lead to students correcting their own errors than were recasts or explicit corrections. The research of Lyster and Ranta indicates that elicitation is the most effective strategy because it requires the student to elaborate on the message conveyed, a process that leads to the correct answer. These researchers found that, in order to promote oral proficiency, teachers should avoid recasts as much as possible because they do not require the student to try to self-correct errors. The purpose of this study is to determine specific instructional techniques that high school Spanish teachers use to help their

students develop oral language proficiency and specific methods of error correction teachers use to help students increase their oral proficiency.

Methodology

Six high school Spanish teachers who teach Levels I, III, IV, V and Advanced Placement in a small city in North Carolina participated in this study. The study was conducted in two parts. First, the researcher interviewed six high school Spanish teachers. The interview questions were designed by the researcher to evaluate specific instructional practices teachers use to promote oral proficiency, strategies they use to assess students' development of oral proficiency, and the frequency and timing of error correction. In the second part of the study, the researcher observed twelve classes, two classes taught by each of the six teachers. During the observations, the researcher noted instructional practices of the teacher and methods of error correction.

The researcher looked for similarities and differences between teacher responses and the data gathered from observations. The interview questions and information gained during the observations were both examined to determine how teachers promote oral proficiency and what methods of error correction they use.

Results and Conclusions

The researcher found that the data gathered from the interviews corresponded to the data gathered from the observations. As the teachers indicated during their interviews, they did many activities during instruction that required oral communication by the students in order to promote oral proficiency. They also spoke in Spanish in addition to requiring that students speak mostly in Spanish so that students become accustomed to hearing and using the language.

Table I shows the percentages of how often each teacher indicated in his/her interview that he/she uses each method of error correction. The teachers were asked how often they used each method on a scale of 0-20%, 20-40%, 40-60%, 60-80% and 80-100%.

	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F
Explicit Correction	0-20	0-20	0-20	20-40	80-100	40-60
Recasts	80-100	20-40	40-60	80-100	60-80	40-60
Clarification Requests	40-60	40-60	0-20	40-60	60-80	60-80
Metalinguistic Feedback	20-40	80-100	0-20	20-40	60-80	60-80
Elicitation	40-60	80-100	40-60	20-40	80-100	80-100
Repetition	40-60	80-100	60-80	40-60	60-80	40-60

Table I

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Table II shows the frequency of each method of error correction as noted by the researcher during two class periods of each teacher.

	Teacher A	Teacher B	Teacher C	Teacher D	Teacher E	Teacher F
Explicit Correction	4	2	1	8	6	15
Recasts	5	11	6	18	8	18
Clarification Requests	2	0	1	7	0	2
Metalinguistic Feedback	2	0	0	2	1	2
Elicitation	4	1	1	2	0	6
Repetition	2	0	0	0	0	14

Table II

In comparing teachers' estimations of the frequency of error correction as stated in the interview with the researcher's observations of practices, half the teachers had an accurate estimation of how often they use each type of error correction. Three of the teachers used recasts most frequently, although they stated in the interview that a different strategy was the most effective. The other three teachers believed that recasts were the most effective and used this strategy most frequently in instruction.

In conclusion, the researcher found that the majority of instruction time was dedicated to oral communication and was conducted in Spanish. During these oral communication activities, the researcher found that teachers most frequently used recasts, the strategy that research says is the least effective. Elicitation was one of the strategies that was least used, yet research has found this method to be most effective. The researcher encourages foreign language teachers to implement error correction strategies that require students to generate correct answers because this process helps the student to internalize the correct answer. As teachers implement these strategies, it is likely that students will be able to communicate more effectively in the foreign language and with fewer errors.

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How Teachers Phrase Discussion Questions

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Introduction

Classroom discussion is one of the most important teaching techniques used to help students learn and understand the information they are being taught. Discussion allows the students to become engaged with the material by formulating their own opinions, listening to other students' opinions, and applying specific information to a broader situation (Santa, Havens, & Maycumber, 1996). When students are faced with probing and open-ended questions, they are given "an opportunity to question their assumptions and opinions and enlarge their critical thinking capacities and gain professional knowledge" (Wood & Anderson, 2001, p. 6). This study analyzed how teachers successfully implemented discussion in the classroom. Specifically, the researcher examined how teachers phrased questions and the student responses that were elicited. Student-to-student interaction and student-initiated questions and comments were also examined.

Literature Review

Larson (1997) defined discussion as a back-and-forth conversation involving students and teachers at a high cognitive level about a specific subject. Teachers often classify discussion more broadly than Larson, however, including any type of verbal interaction with students, be it a closed-ended question or a simple recitation. Alvermann, Dillon, and O'Brien's (1987) comprehensive study of discussion revealed that discussion should have three components that recitation does not: multiple points of view with students ready to change their minds after hearing other students' perspectives, the students must interact with each other as well as the teacher, and verbal interactions must be longer than two or three word phrases. These criteria are all necessary for a true discussion to take place.

Researchers have categorized discussion into several different types, each with their own purposes. In Gallagher and Aschner's (1963) study, discussion was divided into four categories:

cognitive-memory operations, convergent thinking, divergent thinking, and evaluative thinking. Cognitive-memory operations were defined as the reproduction of facts and convergent thinking was defined as the analysis and integration of facts, but within a structured framework. Divergent thinking allowed students to take information in a new direction or add a new perspective, while evaluative thinking challenged students to think about situations and make a judgment or a choice. The study found that when teachers began to ask only slightly more questions in a divergent manner the students' responses in number were exceedingly high. Divergent questions allowed up to 15 and 20 student responses per question, instead of one answer for every question, allowing more students the chance to apply the information in a new way (Gallagher & Aschner, 1963).

In a case study of two Australian teachers, it was found that questioning was important in the transfer of knowledge, skills, and attitudes (Mitchell, 1994). In a meta-analysis of twenty studies, Redfield and Rousseau (1981) found that "teachers' predominant use of higher cognitive questions has a positive effect on student achievement" (p. 244). These findings show the importance of how teacher questioning behavior affects student learning. While discussion is not the only way to accomplish these goals, it is proven to be very effective.

With the knowledge that discussion helps students process information in a relevant way, and that there are effective ways to hold a classroom discussion despite the difficulties, more research is needed to discover how teachers successfully implement discussion consistently in the classroom (Gall & Gall, 1993). In order to thoroughly understand how teachers' questions can be used to elicit better classroom discussion, observation into the workings of a classroom discussion is necessary. Gallagher and Aschner (1963) urged more research into this field by illustrating that if we know desirable outcomes, by working backwards it should be possible to determine effective teaching methods which produced these results.

Methodology

This study attempted to find specific techniques used by teachers to engage students in high-order thinking through discussion. Six teachers, who first responded to an email sent to all secondary social studies teachers in a suburban school district, were observed for a total of five hours. Those teachers who taught block schedule classes were observed for three class periods, and those teachers who taught the regular schedule classes were observed for five class periods. During the observation, teacher questions and student responses were recorded. The exact

phrasing of the teachers' questions was a crucial part of this study. Student involvement and engagement in response to teachers' questions and comments during the discussion was also important, as it revealed which questions were the most effective in eliciting discussion.

Results and Conclusions

Questions were analyzed as to whether they fit into the lower and higher level thinking categories only, by applying Bloom's taxonomy (Woolfolk, 2001). The observation of six social studies teachers generated 269 questions to be analyzed. Student responses to teachers' questions were recorded as either short, extended, or student initiated. Answers classified as short were one or two word responses, simple definitions, or brief thoughts. In the 144 questions that received only short responses all of the questions asked for only lower-level thinking. Most of the teachers' questions asked for the students to recall specific information: "What form of government started in Athens?" "How many legal immigrants are accepted each year?" "What is dissent?" These questions only asked the student to remember information he or she had read or been taught, and no deeper understanding is demonstrated by the answers. The questions did not drive towards any higher level of thinking. Of these 144 short-response questions, there are further divisions that can be examined. Only one student was involved in answering 113 of the questions, rather than multiple students responding. Not only are the questions focusing only on remembering information, but the teacher is really only able to see if one student remembers the information. Eleven of the questions that received only short responses were answered by more than one student, but the students' answers were directed to the teacher. No discussion resulted even though multiple students were involved.

There were also twenty questions, of the 144 short-response questions asked by the teachers, which elicited entire class responses in unison. These responses were always short (generally one word) and the class would answer together. Some of these questions were "Where are the Swahili?" "Are they in Europe?" "Who makes up the religious class?" These questions were all lower level thinking and only required students to recall specific information. In total, 144 questions out of 269 generated only short responses.

Student responses classified as extended thoughts involved the student explaining information and connecting it to new situations. Out of the 269 questions asked, 103 received only extended responses. Most of these questions forced the students to use higher level thinking skills to answer them. Some of these questions were "How did trade cause the rebirth?" "If you

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had the opportunity to write your own textbook, what would you include?" "Should a prince be clement or cruel?" These questions ask the students to break information down into parts, create something new by combining different ideas, and judge the value of materials. There were still questions that only incorporated lower level thinking, however. Questions such as "What is a turning point?" "What happened in the aftermath of the bomb?" and "Why is that a threat to the church?" only ask students to recall information and use the information to solve a particular problem. Despite the fact that these questions received extended responses from students, they did not force the student to use higher level thinking.

Many of the questions that received extended responses from students asked the student for his or her opinion. Questions such as "Is war justified?" "What would you rather see your society do?" and "Which Crusade was the most successful?" all ask the student to judge the value of the material and apply it to a particular situation, the evaluation stage of Bloom's taxonomy. Students respond well to the questions when they have been given the chance to work their way up to the higher levels of thinking. Opinion questions allowed students the chance to make a personal connection to the material.

Only 22 of the 103 questions that elicited extended thoughts provoked responses that lasted over one minute. All of these questions elicited participation from multiple students and all were extended responses. Of these questions, half asked the students their opinions. This shows that most questions asked by teachers do not elicit the type of discussion that is most effective in helping students learn.

Twenty-two questions, of the original 269 total questions, also received both short and extended responses, however. With multiple students responding to the same question, some of the responses were short, while others were extended. Only four of these questions called for higher order thinking, yet extended thoughts were still generated from students. At the same time, however, short responses were also received to the questions. The 144 short responses, 103 extended responses, and 22 short and extended responses show the frequency of student responses to the teachers' 269 questions.

Not only was the length of the student responses to teachers' questions analyzed, but student-to-student interaction, number of students participating, and student-initiated thoughts were also analyzed. Questions provoking multiple students to respond only occurred with about one-quarter of the questions. In the 88 questions that had multiple student responses gathered,

most of those responses were extended thoughts. Yet, even with multiple students participating most of the responses were directed towards the teacher, not other students. Student to student interaction was very rare. Most of the questions started with one of the interrogatives "who," "what," "why," and "how."

Only 19 questions orchestrated student-to-student interactions with the material or student-initiated thoughts out of the entire 269 questions analyzed. All of these questions fell within the category of eliciting extended thoughts. Several questions that elicited these responses were "What is the modern day equivalent?" "Would you kill your immediate family to save the world?" and "Relate to Iraq: at any points, are US soldiers justified in killing a prisoner?"

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Effective Instructional Methods in Relation to Negative

Learning Instances in the English Classroom

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Teaching offers many opportunities for positive interaction with and among students, yet one of the most common complaints from teachers relates to the amount of time spent dealing with negative student behaviors. Teachers must be sensitive to the individual needs of students in order to practice instructional methods that will most effectively engage students in the learning process. One way to define the effectiveness of an instructional method is through measuring the amount of negative learning instances that occur in each classroom and within each instructional method. Under the assumption that less negative learning instances occur when students are actively engaged in learning, the purpose of this research is to determine which instructional methods produce the highest level of student involvement, based upon the occurrence of negative learning instances within the classroom.

Review of Literature

One of the greatest challenges all secondary English teachers face is that of maintaining student engagement within the classroom. Cockman (2002) states that many high school students feel disenfranchised in the English classroom, but teachers should do all that is possible to make certain no student leaves their classroom with this sentiment.

A key component in maintaining student engagement lies in the effectiveness of the instructional method(s) utilized by the teacher. Edith Sims, the principal of an award-winning inner-city high school, states in his article, "Successful Programs, Policies, and Practices Employed at Corliss High School" (1988), that his teachers were well prepared and constantly exhibited effective teaching behaviors in their classrooms, while also using a variety of strategies and materials to meet student needs and cover the course content. No school is immune to the devastating effects of ineffective instructional methods. For example, 'the pedagogy of poverty' that often permeates the educational environment of poor, urban students reveals itself through a

combination of teaching activities that do not engage students but rather lock them in a routine that does not allow for student creativity or methods of alternative learning (Stevens, 1993). A similar phenomenon could just as easily occur in schools largely attended by students from upper-class families if the teachers are not attuned to student needs and are not willing to employ instructional methods that will best meet these needs and actively engage students.

Researchers have investigated instructional methods in great detail. For example, studies by a number of researchers found that small group discussions often elicited the participation of students more effectively than did entire classroom discussions, by providing a safer place for students to speak (Connolly and Smith, 2002). The underlying idea throughout educational research regarding instructional methods seems to be that every method has both advantages and disadvantages, depending upon the instructional situation (Weston and Cranton, 1986).

Star teachers consider themselves "on task" as long as they are "seeking ways to involve students in learning activities" (Haberman, 1995). One instructional method can be more effective than another, depending on a number of factors within each specific learning situation. A better understanding of how to effectively engage students will aid in helping teachers "become knowledgeable of the conditions or variables that will promote quality teaching and produce high academic achievers regardless of racial/ethnic or socioeconomic distinctions" (Stevens, 1993).

Methodology

The participants in this study included the teachers and students of four high school English classes in a public school system in the southeastern region of the United States. Classes ranged from grades ten through twelve and included students of both genders, varying ethnic and socioeconomic backgrounds, as well as students of various academic abilities. The teachers were assigned the letter A,B,C, and D for the purposes of data analysis. Data was analyzed based on thirty-two class periods, as research was conducted during eight class periods in each teacher's classroom. Research was based on classroom observation with the intent of viewing teachers and students in their natural learning environment.

During each class, the researcher focused on the aspects of teacher and student behavior that highlighted effective instructional methods in relation to the occurrence of negative learning instances. Negative learning instances were defined as any student behavior that impeded or disrupted the learning process. Such negative learning instances included sleeping, conversing

with other students about non-curricular topics, obvious daydreaming, moving about or from the room without permission, making disruptive comments or actions, writing and/or passing notes, placing one's head on the desk, working on something not related to class, primping, and not following directions.

The researcher maintained a detailed time log for each class period that specifically noted the amount of time spent within each of the following instructional methods: Group Work, Individual Work (Structured and Unstructured), True Discussion, Teacher-Based Discussion, Partial Lecture, Worksheet Review and Alternative Learning Activities (Student-based and Non Student-based). The amount of time allotted to other classroom activities, such as beginning class, making transitions between instructional methods, testing, taking care of classroom business matters, and ending class was noted, as well.

The researcher also recorded the number of negative learning instances that occurred during the implementation of each instructional method or other classroom activity. Each negative learning instance was noted in the research by a specific symbol.

At the conclusion of the observations, results were analyzed to compare the proportion of class time spent within each respective instructional method or other class activity to the amount of negative learning instances that occurred during each instructional method.

Results and Conclusions

The teachers in the study varied in their use of instructional methods (See Table 1).

Table 1 – Instructional Methods in Relation to Percentage of Class Time Utilized

	A	B	C	D	Total
Group Work	--	--	5%	--	1%
Individual Work (Structured)	21%	18%	7%	4%	12.5%
Individual Work (Non-structured)	--	--	12%	3%	4%
True Discussion	--	8%	--	24%	8%
Teacher-based Discussion	7%	26%	16%	31%	20%
Partial Lecture	10%	1%	8%	1%	5%
Worksheet Review	8%	9%	--	2%	4.5%
Alternative Learning Activity (SB)	40%	10%	--	9%	15%
Alternative Learning Activity (NSB)	--	2%	28%	--	7.5%

*SB = Student-based / NSB = Non student-based

An instructional method was considered highly effective if the percentage of total negative learning instances that occurred during the implementation of the method was less than the percentage of class time devoted to the instructional method. If the percentages were close to equal, then the instructional method was considered neutral, neither effective nor ineffective. If the percentage of total negative learning instances during an instructional method was higher than the percentage of class time allocated to the instructional method, then the method was considered ineffective (See Chart 1).

Chart 1
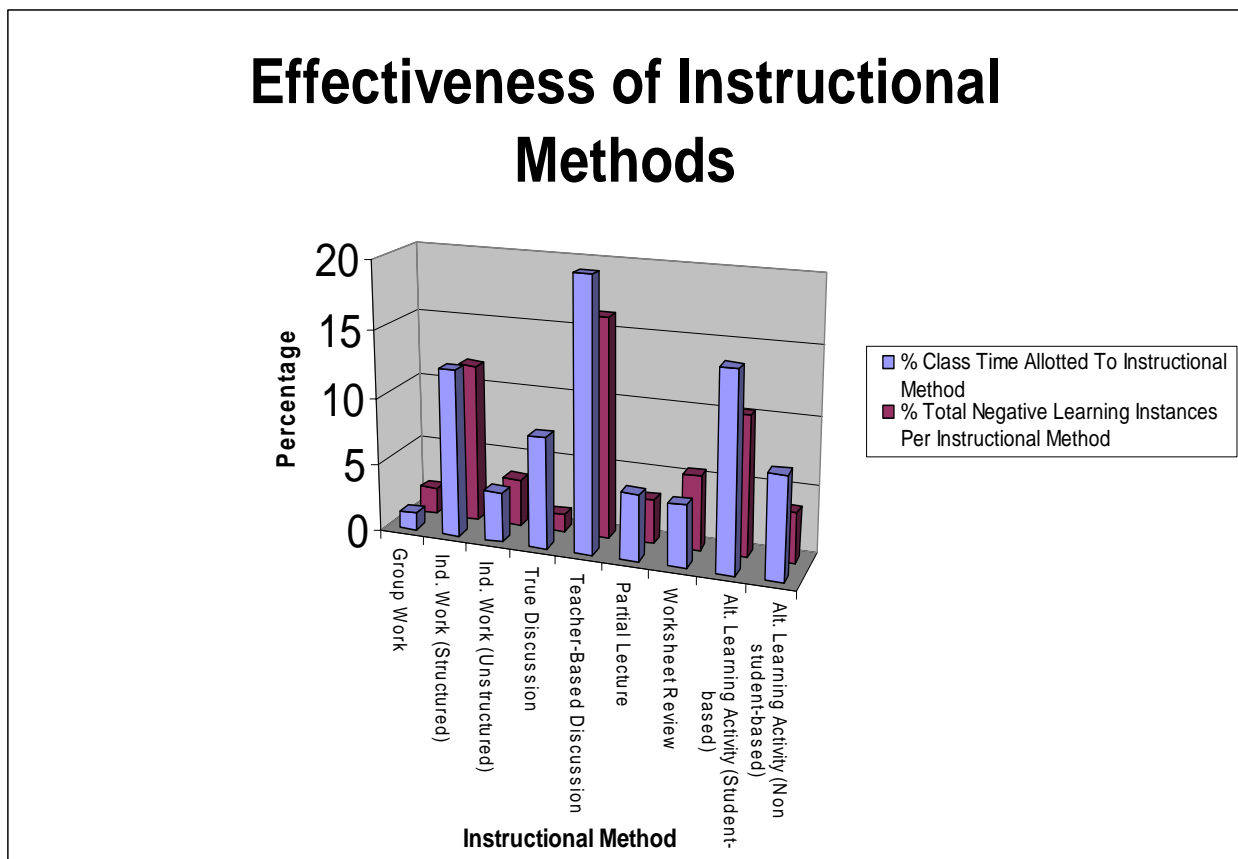
Based upon the results of the study, the most effective instructional method was True Discussions, with a -6.75% relationship between the percentage of class time and percentage of total negative learning experiences. Alternate Student Learning Activities proved the next most effective, as Student-based Activities had a relationship of -4.75% and Non Student-based Activities had a relationship of -3.75%, along with Teacher-Based Discussions. Both Structured

and Unstructured Individual Work were fairly neutral, as the percentage of class time and percentage of total negative learning experiences during these instructional methods were separated by less than 1%. Although only separated by +1%, Group Work and Worksheet Review were the least ineffective instructional methods.

Recognizing that every teacher has different gifts and abilities, and that each class has students with different needs, there are some universal ideas to apply in any classroom. First of all, teachers should be aware of how time is spent in their classrooms, for this study suggests that too much time is spent on activities that do not actively engage students in the learning process. In order to aim for the fewest number of learning instances and thus engage students more effectively, teachers should practice instructional methods that are based on students and their active involvement in the learning process. A key to more actively engaged students in the English classroom lies in limiting negative learning instances and thus increasing the possibility of positive learning instances.

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Anxiety in the Secondary Foreign Language Class

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Introduction and Literature Review

Many students can experience anxiety in different academic settings. One of the most common subject areas in which middle and high school students feel anxious is foreign language. This is a unique experience for students because they are removed from the comfort zone of their native language and must learn an entirely new way to communicate. This can be a frustrating experience for some students who find themselves having difficulty learning a foreign language.

Horwitz, Horwitz, and Cope (1986) identified three types of foreign language anxiety: 1) communication apprehension, 2) test anxiety, and 3) fear of negative evaluation (p. 127). The most common type of foreign language anxiety is communication apprehension which is anxiety related to interpersonal settings such as oral presentations and group work. In her research on anxiety and speaking, Young (1990) found that many students dread being "put on the spot" (p. 550), and they cite oral language production as the situation that produces the most anxiety for them when learning a foreign language. This type of anxiety occurs when the student believes that others will have a difficult time understanding him/her, and as a result, the normally talkative student often becomes silent in a foreign language class (Horwitz, Horwitz, & Cope, 1986). In her research on listening comprehension anxiety, Vogely (1998) found that some students become anxious when they do not understand the conveyed message. These situations, in addition to the unique process of learning a foreign language, can create feelings of anxiety in students.

The second type of foreign language anxiety is test anxiety. This concerns the fear of failure and occurs when a student is in an evaluative situation such as a listening comprehension activity, a written evaluation, or an oral assessment. The most anxiety-inducing tests for students are oral language assessments; however, students who experience anxiety in this situation may

also feel anxious when taking other types of tests (Young, 1991). Many foreign language students who experience test anxiety perceive anything less than a perfect test score as failure (Horwitz, Horwitz, & Cope, 1986). Students who experience this type of anxiety are at a marked disadvantage in a foreign language class as quizzes and tests are frequently given to assess students' progress (Horwitz, Horwitz, & Cope, 1986).

Lastly, fear of negative evaluation has to do with others' perceptions in evaluative situations. Students with this type of anxiety are concerned about the views other students and the teacher have of them. In foreign language instruction, the teacher continually evaluates students, and they are also vulnerable to other students' judgments (Horwitz, Horwitz, & Cope, 1986).

It is important to recognize situations that can cause students to become anxious because increased anxiety may create difficulty in acquiring a foreign language (Krashen, 1982; Horwitz, Horwitz, & Cope, 1986). The purpose of this study was twofold: 1) to investigate specific situations related to test anxiety, fear of negative evaluation, and communication apprehension that create anxiety in students learning a foreign language and 2) to determine how teachers address these students' needs through instructional practices in order to make learning more effective for them.

Methodology

The researcher conducted the study in a public school district in a medium sized southeastern town in the United States in the fall of 2003. The study was carried out in two parts. First, the researcher interviewed four French and Spanish teachers of Levels I-V. The purpose of the teacher interview was to determine the specific instructional strategies teachers use to alleviate feelings of anxiety in their students. The researcher wanted to examine ways in which teachers modify their instruction to accommodate anxious students through the use of evaluation techniques, group work, and error correction.

The second part of the study took place one week following the interview. The researcher administered a questionnaire to students in three Level I classes and one Level III class taught by each teacher in order to better understand specific situations that cause students to become anxious in foreign language class. The subjects were 55 public high school students enrolled in a Level I or III foreign language class, and they ranged in age from freshmen to seniors.

The student questionnaire and teacher interview questions are researcher-created instruments based on foreign language anxiety research and the foreign language anxiety questionnaire developed by Horwitz, Horwitz, and Cope (1986). The student questionnaire included Likert Scale statements and open-ended questions to determine specific situations that are the most anxiety inducing to the students. The teacher interview format was also a Likert Scale that included open-ended questions. It focused on situations that the teachers perceived to cause student anxiety and what they do to alleviate anxiety in their students. The student questionnaire and interview questions are the basis for the results, comparisons, and recommendations that follow.

Results and Conclusions

In the analysis of the results of the student questionnaire, the researcher distinguished the high-anxious learners from the low-anxious learners by looking at all respondents' answers. The researcher classified students as being low-anxious or not anxious if they did not report anxiety of any kind on their questionnaire. The researcher discarded nine surveys from students classified as low-anxious because they did not report on their questionnaire any anxiety when learning a foreign language. Students classified as mid-anxious indicated on their questionnaires that one or more specific situations cause them some degree of anxiety, such as taking a test or giving an oral presentation, but they are not, in general, high-anxious learners. Eighteen respondents were classified as mid-anxious.

Once the researcher determined the student's anxiety level, she then classified him/her into the situation that caused the most anxiety. The categories are test anxiety, fear of negative evaluation, communication apprehension, and overall anxiety. If a student indicated two or more situations that cause him/her anxiety, the researcher classified the student as being overall anxious. If a student indicated a 4 (often) or a 5 (always) answer on one of the Likert-based questions (section II, questions 1-10) and answered "yes" to one or more of the specific situations that cause anxiety (section III, questions 1-4), the researcher classified the student as high-anxious. Twenty-eight students were classified as high-anxious.

Both teachers and students reported that certain instructional techniques are more helpful than others in alleviating anxiety, including group work and the interviewed teacher's repetition of questions in a variety of ways for the student. The researcher noticed, however, that the teachers did not seem to be aware of the high number of students in their classes who are anxious.

Forty-six of the 55 students who answered the questionnaire (83.6%) indicated that they experience mid to high levels of anxiety when learning a foreign language, whereas all four of the teachers responded in the interview that they are aware of anxiety some of the time in their classes.

The researcher was surprised to find the proportion of females to males that are anxious foreign language learners. Three times as many females as males reported feeling anxiety even though 38% of the participants in the survey were male.

Research shows that some students who tend to be anxious learners often have difficulties in their native language, which can then lead to difficulty learning a foreign language (Sparks & Ganschow, 1991; 1993; Ganschow & Sparks, 1996; Sparks, Ganschow, & Patton, 1995; Ganschow, Sparks & Javorsky, 1998). However, the researcher did not find this to be the case in this study. Of the students who were classified as high-anxious, 25 of 28 (89.2%) reported receiving a grade of C or higher as their final grade in the previous year of English.

It is also interesting to note that 64.3% of the high-anxious learners had some type of experience with a foreign language outside the classroom, such as visiting a foreign country or being exposed to experiences in the United States in which they communicate with a native speaker. This finding contradicts current research, which indicates that students who are exposed to the target language in a non-classroom setting often feel less anxiety than those students whose only experience with the language is in an academic setting (Onwuegbuzie et al. 1999). The findings of this study indicate that, for students who completed the questionnaire, exposure to the target language outside the classroom does not seem to alleviate foreign language anxiety.

Research also shows that students experience the most anxiety in communication situations where they use the language orally or when they hear the target language (Horwitz, Horwitz, & Cope, 1986, and Young, 1991). Thirty-nine point three percent (39.3%) of the high-anxious students reported feeling anxiety in these situations, and half (50%) of the 18 mid-anxious students indicated that these situations cause them to feel anxious. This study finds that additional research regarding the correlation between oral communication activities and anxiety would be beneficial to understand better how foreign language instruction can be modified for these learners.

In conclusion, the researcher recommends that future studies be conducted to examine more in depth the following topics: the reason that such a high number of students experience anxiety in the secondary foreign language classroom, why more females than males are classified as high-anxious, and why students are most anxious about using the target language orally. It would also of interest to examine effective strategies foreign language teachers can use to modify instruction in order to accommodate anxious learners their classes.

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Cooperative Learning in the Mathematics Classroom

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Introduction

Student attitude affects classrooms across all levels of education from preschool to college. In high school, students are becoming more accustomed to showy presentations like those they encounter on the internet and television. The attitudes that students bring to the classroom not only affect how they behave in class but whether they actually learn the material. The teachers challenged with reaching high school students are required to adapt their teaching so that today's students are successful in their learning. The National Council of the Teachers of Mathematics states that, "to be effective, teachers must know and understand deeply the mathematics they are teaching and…use a variety of pedagogical and assessment strategies" (NCTM, 2000, p. 16).

Teaching style must be varied and changed through any given class section so that students will not become bored with the teaching and thus with the subject. The variable of teaching style versus student attitude is a concern for all teachers. Cooperative learning is more than just putting students into groups and allowing them to work together (Woolfolk, 2001). It is a structured lesson style that requires each student to be responsible for a specific task that is integral to the successful learning of the group.

Review of Literature

Many studies of students' attitudes toward mathematics have linked attitude with achievement within mathematics. Attitudes were defined by Iben (1991) as students' mathematics confidence, extrinsic mathematics motivation, mathematics usefulness, and intrinsic motivation to study mathematics. Iben (1991) concluded that students' attitudes toward mathematics are affected by their cultural status, ethnicity and gender.

However, these factors are not the only ones that can affect student attitude within the classroom. Abu-Hilal (2000) found that attitude toward school in general was the most important and it affected all major content areas. Abu-Hilal (2000) also found that student goals

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and perceptions about specific subject areas affected the attitude and academic performance of the students. Abu-Hilal warned that the type of assessment (standardized versus classroom grades) may have played an important role in student's attitudes.

The National Educational Longitudinal Study of 1988 followed a group of 8th graders from 1988 until their graduation in 1992. From this study Butty (2001) obtained a sample of 364 African American and Hispanic students. The findings of this study were that the correlation between instructional style and student attitudes toward mathematics was not as strong as instructional style and student achievement in mathematics. Through these studies it is easily seen that attitude affects students in all parts of their educational career and more specifically within their mathematical track.

Traditionally a teacher-centered lecture style is employed in many mathematics classrooms in the United States. This method can be very effective when it is not the only method implemented in a single classroom. Another method that is widely accepted within the educational field is cooperative learning. Johnson and Johnson (2000) stated,

> "a cooperative learning group is one that has positive interdependence, where shared goals link group members; individual accountability, where each group member needs to know the material; and cooperative skills, where students support one another rather than put one another down" (p. 1).

Woolfolk (2001) emphasizes that cooperative learning is "more than simply putting students in groups" (p. 340). Cooperative learning can be difficult to implement without careful planning and clear instructions to the students (Berg 1993). Researchers claim that cooperative learning has many positive effects in the mathematics classroom if it is properly implemented (Walmsley & Muniz, 2003). Berg (1993) also cited a positive reaction from students about their attitude toward preference of teaching style received. Walmsely and Muniz (2003) found similar results when using cooperative learning in a high school geometry classroom and focused on a need for individual and group accountability standards for each student in order to successful implement cooperative learning.

Research done by Whicker, Bol and Nunnery (1997) found that the results of earlier studies held true, "that cooperative learning promotes mathematics achievement in the secondary grades" (pp. 46-47). However, much of the research that has been done on cooperative learning has been done in non-secondary classrooms.

Stuart (2000) conducted a study with fifth grade mathematics students hoping "to see how their own attitudes, as well as those of the people around them, affected their confidence level. [Stuart] also wanted to know what teaching strategies the students thought worked best for them." (p. 331). Stuart found that student attitude toward cooperative learning groups were very positive citing student responses, "that sometimes peers could explain things better than the teacher" (p. 333).

Throughout the research on cooperative learning most studies looked at achievement but very few looked solely at attitude. Nichols and Miller (1994) began to move away from solely looking at achievement and incorporated student motivation into their research. Attitude toward mathematics and school in general sets the tone of a classroom and can either foster or hinder learning. Walmsley and Muniz (2003) concluded that, "cooperative learning has a positive effect on students' achievement and attitudes toward mathematics" (p. 116).

Methodology

This study involves descriptive survey-based research was carried out to try to determine if a change in attitude occurred in students who were using cooperative learning in their mathematics courses. A survey was given both before and after the implementation of the cooperative learning activities into a traditional classroom setting. The survey, adapted from Walmsley and Muniz (2003) was a Likert-style scale with ten questions concerning a student's attitudes and self-perceptions with regards to mathematics. The survey also had a free response section where the student could elaborate on anything about cooperative learning they felt was important but not covered on the survey. The classes chosen at the high school were two algebra two classes consisting of about 20 students per class. Cooperative learning was implemented a minimum of three times during each of three weeks of the study. Students were placed into teacher-assigned groups consisting of three students. During the study a variety of different cooperative learning activities were implemented. These included: writing a daily group journal entry recapping the important ideas and concepts from the day's lesson; cooperatively doing a review carousel (students work through teacher and student posted problems around the with a specific interval of time at each station); cooperative practice involving group presentations (presenters drawn at random at from group); cooperative review activity that asked students to work through practice test problems and be prepared to answer them as a group.

Results

The focus of the research was on the implementation of cooperative learning into a traditional classroom setting. The effect of this implementation was measured by both student attitudes toward cooperative learning and attitudes toward mathematics in general. The pre and post survey had seven questions that dealt with student attitude toward cooperative learning. The questions were worth from one to four points each, so that a score between seven and 28 was recorded for each student during both the pre and post survey. A score of seven indicated a strong dislike of cooperative learning while a score of 28 indicated a strong like of cooperative learning. Table 1 shows results for the study. The t-test indicated that the positive change seen in the attitude toward cooperative learning was non-significant (t (59) = -.090, p > .05).

Table 1. Cooperative Learning Attitude

Survey	Mean	Standard Deviation	N	T	Degrees of Freedom	Significance (2-tailed, p)
Pre	18.16	3.287	31	-.090	59	.929
Post	18.23	2.956	30			

Three questions on the survey asked students about their attitude toward mathematics. These questions were quantified with a point value and then compared for the pre and post surveys. Again, the items were worth one to four points, so the possible scores for the attitude mathematics were between three and twelve; three being a very negative attitude toward mathematics and twelve being a very positive attitude toward mathematics. The results are listed in Table 2. The t-test of independence indicated that the change in student attitude toward mathematics was non-significant. (t (59) = .322, p > .05).

Table 2. Mathematics Attitude

Survey	Mean	Standard Deviation	N	T	Degrees of Freedom	Significance (2-tailed, p)
Pre	7.87	2.825	31	-.322	59	.749
Post	8.10	2.734	30			

Conclusions

Does student attitude become more positive toward mathematics when cooperative learning is implemented in a traditional classroom? This is the first question this study intended to answer. Since the data collected was non-significant, the slight change in attitude toward

mathematics and cooperative learning is only due to chance and no relationship between the implementation of cooperative learning and attitude toward mathematics or cooperative learning can be formed. The data collected did show that students had a slightly more positive attitude toward both mathematics and cooperative learning before implementation of cooperative learning in a traditional classroom environment, even though this difference was non-significant..

This lack of change can be due to many factors. The most obvious noted by the researcher was the duration of time used during this study. The span of three weeks is not enough time with the students to get them fully accustomed to the changes involved in correctly implementing cooperative learning into a normally traditional classroom setting.

Other insight gained by the researcher was that to successfully implement cooperative learning in a traditional classroom skilled and careful planning is a must, agreeing with Bassarear & Davidson (1992) and Berg (1993). It was also noted that both group and individual accountability must be present for cooperative learning to be successful as stated by Artzt (1999).

While the research at hand does not allow for much to be added to studies like the canon of research knowledge already present on cooperative learning, it leads this researcher to further question whether cooperative learning is a key to helping students improve their attitudes toward mathematics.

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The Effect of Mythic- Archetypal Criticism on Student Response in the English Classroom

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Introduction

Franz Kafka has stated that literature can serve as the "ax for the frozen sea within us" (1977). When students analyze the evocative power of story, they can use it to illuminate their own lives. This research examined the effectiveness of mythic- archetypal criticism in the English classroom and how the implementation of it affects student responses.

Review of Literature

There are various approaches to language arts teaching that are based on "mythic" or "archetypal" ways of experiencing and knowing. These approaches address the inner lives of students more directly than do instructional methods such as whole language or student-centered instruction. A mythic approach to learning can help to promote imagination, creativity and imagery production in the classroom. Such an approach will aid teachers and researchers in beginning to better address instinctive, holistic functions of students (Roberts, 1989).

"All stories consist of a few common structural elements found universally in myths, fairy tales, dreams, and movies" (Vogler, 1998). In his book, Vogler sets forth archetypes common in what he calls "the hero's journey," the mythic structure that he claims many stories follow. He lists the different kinds of typological characters who appear in stories, discusses the stages of the journey through which the hero generally passes, and explains in detail how modern pieces of literature and films follow the patterns he has outlined.

Carl Jung (1966) defined the term "collective unconscious" as a level of awareness from which we see the images in our minds when we are at the ending phase of our sleep and when we awaken from dreaming. He calls these images "archetypal," and believes that the archetypal images in our collective unconscious are ever- present in all humans. Jung claims that throughout time, myth has followed particular patterns because humanity has always shared a mutual unconscious set of experiences. And it is our common experiences that provide the basis for symbols, imagery, and myths around the world. (Birenbaum, 1988).

By incorporating Jung's theories of myth, Crow (1986) encourages teachers to become aware of the archetypal model in much of literature, and by making students aware of the model, to incorporate that model into the classroom. Crow suggests ways to encourage students to analyze their own experiences that might contain archetypal themes and then to use those discoveries as inspiration for their own writing. Crow (1986) also takes introspection a step further when he challenges teachers to help their students use "steppingstones" such as journals or writing workshops to divide their lives into sections. Students then write about their lives not by analyzing conscious life, but by exploring dreams, fantasies, and what Crow calls "twilight imagery," which is the images and ideas that a person experiences in the weak- minded time just before sleep. Students who write and reflect on their unconscious minds will discover their own mythic-archetypal patterns. And by traveling from the unconscious experience to the objective writing process, students can realize the connection and disconnection between their inner-most selves and the self that they (and others in their lives) allow the world to experience.

Simply put, an archetype is a universally recurring pattern of character, symbol, or situation found in mythology, religion, and stories. In the context of myth and archetypes, Campbell defined his work as a search for "the commonality of themes in world myths, pointing to a constant requirement in the human psyche for a centering in terms of deep principles" (Campbell, 1988). Jung defined his idea of the archetype as a formula which has resulted from "…countless experiences of our ancestors. They are, as it were, the psychic residue of numberless experiences of the same type" (Jung, 1966). Both men felt that the experience of being human can be examined collectively regardless of time, space, and culture, and that our commonality can be traced to extremely primitive origins of our human consciousness. And it is at this point where language arts can challenge the introspection of men and women to aid them in discovering themselves, their direction and their own value systems.

Methodology

Participants

The participants for this study were secondary language arts 12th grade students from a private high school in the Southeastern United States. The students were honors level students and were engaged in a Socratic seminar language arts class based around the power of story.

Measures and Procedures

This study determined the students' reactions and experiences to the use of story as the driving force in the classroom. The researcher informed the students that their time was greatly appreciated and that their personal information and answers would remain confidential. The researcher immediately began performing numerous observations which sought to determine if there were increases or decreases in participation, engagement with class material, and enthusiasm for subject matter.

To determine the level of participation, the observer noted each student's habits and average number of responses per class period at the school year's beginning and watched the progression or regression of those responses as the year continued. Engagement with class material was noted according to the number of times students spoke about works outside of set class time and number of references students made to various works studied during class. Enthusiasm was judged by noting students' general disposition and attitude toward class and its subject matter and the changes that occurred in these dispositions.

By analyzing the data of increases and decreases in the various sections of observations, the observer noted how many students felt positively about the use of story in the classroom, how many students felt negatively, and how many students were indifferent to the use of story in their language arts classrooms.

Analysis

After researcher recorded and categorized observations, the analysis portion of the study began. The researcher compiled the categorized student response averages at the beginning of the semester and compared those findings to the categorized student response averages at the end of the semester. The researcher noted the variation in averages from beginning of the semester to the end of the semester in each category stated and then ran a Chi-Square statistical analysis test to determine if the differences in response were significant. Through observation and data analysis of participation, engagement and enthusiasm, the researcher determined which specific aspects of student responses were in fact affected by mythic- archetypal analysis being brought into the classroom, and in which aspects the analysis proved tedious or inconsequential.

All background literature, research, and data were then compiled into an abstract and a paper. The abstract highlights the main ideas of the research and entices readers, while the paper breaks down the steps of the research and the analysis of data.

Results and Conclusions (Discussion and Implications)

After the students became accustomed to the use of story and archetypal approaches to their literature classroom, more students commented on the information presented, offered more in depth comments in class, initiated conversations more often, and most importantly, related the literature being studied to their own lives. The changes between the averages of each event occurring at the beginning of the semester and at the end of the semester (after the archetypal and story approach had been established) are recorded in Table 1.

Table 1: Alteration of Student Frequency Averages over Semester of Course

Student	Number of Student Comments	Number of in-depth comments	Student-initiated discussions	Connection between literature and self
1	0.2	0.3	0	0.1
2	3.0	0.6	0.6	2.3
3	0.3	0	0.2	0.6
4	0.9	-(0.3)	0.1	0.4
5	2.2	0.2	0.6	1.2
6	1.5	0	0.1	0.4
7	0.2	0	0	0.4
8	1.3	0.2	0	0.4
9	-(0.1)	-(0.2)	0.2	0.7
10	0.9	0.4	0.2	0
11	0.8	0.1	0.3	0.4
12	0.8	0	0	1.2

To determine whether or not the discrepancies in the averages were significant, I conducted one Chi Square test for each category listed. The statistical analyses results are recorded in Table 2.

Table 2: Chi Square Statistical Analysis Test

Category	Chi Square Test Results
Student Comments	$X^2 (1, N = 42.2) = 3.41, p > .05$
In Depth Student Comments	$X^2 (1, N = 23.9) = .071, p < .05$
Student- Initiated Discussions	$X^2 (1, N = 4.1) = .061, p < .05$
Connection Between Literature and Self	$X^2 (1, N = 16.1) = 4.08, p > .05$

The results of the above Chi Square test indicate that the use of story and archetypal analysis of literature had a significant impact on the number of student comments offered during class and the connections made by the students between themselves and literature. Though my study is by no means conclusive, it indicates that, because the power of story brings literature to life in the classroom, it creates a comfortable environment in which students are more comfortable presenting their ideas and opinions about literature and are better able to make a connection between the literature that they are studying and their own lives.

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Differentiating Questioning Techniques

in Social Studies for Regular and Advanced Classrooms

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Introduction

The purpose of this study is to investigate questioning techniques teachers use to generate critical thinking in all students by comparing levels of thinking implicit in their questioning between regular and advanced sections of the same course. This method assumes that the types of questions a teacher asks are related to the level of thinking they are intended to produce. Questions high school social studies teachers asked were classified according to Bloom's taxonomy of educational outcomes (Bloom, Engelhad, Furst, Hill, & Krathwohl, 1956).

Social studies classes are often associated with names, dates, and places. What students should be learning are the meanings of those facts to help them learn from the past, make sense of the present, and prepare for the future. The knowledge they gain must also be comprehended, applied, analyzed, synthesized, and evaluated. Brain research and developmental psychology have continually informed educators of the importance of stimulating learners to use these higher order thinking skills (Caine & Caine, 1991). Yet the issue becomes increasingly difficult to address as standardized testing, most of which measures lower order retention of curriculum and not higher order thinking, becomes ever more pervasive in public education (Tindal & Nolet, 1995).

Traditionally, critical thinking skills were taught to gifted students in the context of an enrichment program or advanced course of study. However, different levels of thinking can be tapped into whenever teachers ask questions and lead students to ask their own questions (Foote, 1998; Graesser & Person, 1994). Social studies in particular provides a naturally rich environment in which students can learn and practice the arts of critical thinking to be applied in all subject areas (Hynd, 1999; Kaplan, 2002; Roberts, 2002).

Review of Literature

Studies on differentiation tend to be located mostly in the gifted education or special education literature. Westberg, Archambault, Dobyns, and Salvin (1993) found that gifted students in an elementary school were not receiving an ideal level of differentiated instruction. Their results also indicated that both the gifted and regular students in mixed-ability classes were being short-changed in critical thinking questions and enrichment activities. The success of the Schoolwide Enrichment Program investigated by Gentry, Moran, and Reis (1999) supports the need for and appropriateness of enrichment for all levels of students.

The practices of differentiation, tracking, and ability grouping have been well-covered in educational discourse (Lou, Abrami, & Spence, 2000; Shields, 2002). Yet few enrichment programs designed for average or below-average student populations have been studied. Barak and Dopplet (1999) studied a successful technology education program designed to teach and facilitate creative thinking in low achieving Israeli high school students. Riesenmy, Mitchell, Hudgins, and Ebel (1991) found that all students in their study were able to use higher order thinking skills if teachers make a specific effort to train them in the processes.

The frequency of questions asked students is a measure of the level of classroom dialogue, which encourages critical thinking (Hess & Posselt, 2002). Larson (2000) found teachers may be less likely to use discussion with regular classrooms because they feel it requires a base knowledge and level of self-control more likely to exist in advanced groups. The types of questions asked are a measure of the level of thinking stimulated. Though critiques, variations, and new typologies continue to enter the field (Hicks, 1995; Ivie, 1998; King, 1986; Lipscomb, 2001; Walters, 1990), Bloom's taxonomy is still widely acknowledged to be the most legitimate and useful in educational research and practice to date (Bloom et al., 1956; Sousa, 1995).

Methodology

The five participants in this study were high school social studies teachers who teach two or more sections of a history course at two different ability levels. Data were limited to transcriptions of teacher questions, excluding student responses. Though students' answers are relevant to assessing the usefulness of the taxonomy, this is not the purpose of the present study.

Bloom's taxonomy is specified as one of "educational objectives" and the classification of "educational goals" (p. 1-2), which are outwardly measurable, as distinct from educator

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objectives and intentions, which are not. The classes in the taxonomy range from simple to complex behavior, with each new class building on the previous. It includes six main classes:

|	
1.00 Knowledge	Remembering information, from simple and concrete to complex and abstract.
2.00 Comprehension	Understanding the literal message of a communication.
3.00 Application	Using previously learned information and comprehension in a new situation.
4.00 Analysis	Breaking down material into elements, relationships, and organizational principles.
5.00 Synthesis	Putting elements together in a new way or pattern not previously seen.
6.00 Evaluation	Making conscious judgments as distinct from intuitive opinions.

Data Analysis

After recording questions, I coded them according to Bloom's taxonomy of educational objectives (1956) to compare the percentage of questions asked that would be considered to have a goal of knowledge, comprehension, application, analysis, synthesis, and evaluation. Figure 1 shows a sample of questions from each category of the taxonomy.

Figure 1. Sample questions

Level	Sample Question
Knowledge	• What was the other name for the Black Death?
Comprehension	• [How would you] rewrite the Gettysburg Address or the Emancipation Proclamation in your own words?
Application	• Playing the role of attorney for the defense or prosecution, how will you defend or prosecute Martin Luther…?
Analysis	• For *whom* does it [the European discovery of the Americas] benefit? For whom is it a problem?
Synthesis	• What are you going to have to take out of state constitutions [to solve these problems]?
Evaluation	• What were his top three most important accomplishments [rank in order] and why?

The number of questions asked in advanced classes nearly equaled the number asked in regular classes (169 to 165, respectively). The percentage of higher-order questions was greater for advanced classes than for regular. Figure 2 shows the difference in percentages distributed across categories.

Figure 2. Percentages of Questions by Level
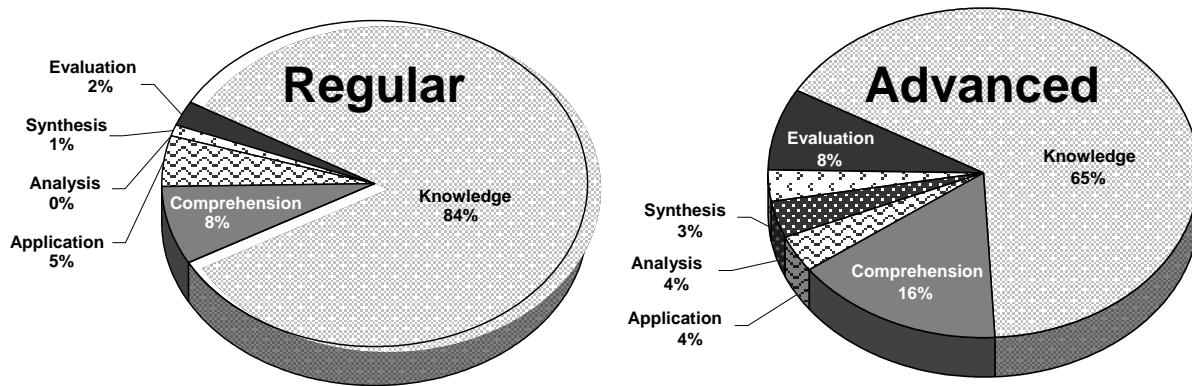
This reveals a more balanced questioning technique for advanced classes. The 19-point difference between regular and advanced sections shows up mostly in a higher percentage of comprehension and evaluation questions. No analysis questions were asked of any regular class that I observed.

Discussion and Implications

The data reveal a disproportionate percentage of lower order thinking questions being asked in both regular and advanced classes. Those who are concerned about gifted education may interpret this to mean that advanced students are not receiving the enrichment they need. Others, concerned about low performance, may interpret this to mean that lower level students are not receiving the stimulation they need. The common thread in the existing literature and in this study is a concern for equity. These findings suggest that all students are being short-changed in terms of higher order thinking. For teachers, this means they need to be more strategic in their questioning techniques, as well as in their differentiation. This study is an example of how teachers can analyze the questions they ask of their students. They can study their lesson plans and artifacts, or even tape class discussions. The process of coding questions into a taxonomy can raise a teacher's awareness and understanding of the correspondence between questions and the thinking they generate.

Future research, larger in sample size and scope of observations, needs to be conducted to make generalizations, as well as to analyze how teachers differentiate questions for students of different abilities within the same class. Though the goal for all students should be higher order thinking, the methods of reaching the goal will differ based on existing knowledge and ability to

think critically. It is possible that with further study, practical methods of differentiation will be understood and integrated into all classrooms.

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How Do Teachers Use Hands-On Materials in the Geometry Classroom?

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Most students will likely Geometry sometime in high school. For many students it is in Geometry that they will have the option to move on to higher level mathematics courses. Attitudes toward mathematics will play a role in deciding a student's mathematics journey. Because Geometry is one such deciding course it is important to make sure that students still enjoy math and want to continue to learn more. Research has shown that using hands-on activities and manipulatives improves students' attitudes towards Geometry. However, it is the teacher's decision to determine how often these activities are implemented in their classroom.

Review of Literature:

For many years the teaching style used by most teachers has been lecture-based; however, in the past decade research has found that many students do not learn this way. The NCTM (1991) stated, "Much of the failure of mathematics in American schools is due to teaching practices that do not take into consideration the learning styles of each student" (p.124). Many teachers are influenced by the way they were taught. To teach in an unfamiliar manner would require stepping outside their comfort zone, which is often difficult for many teachers. More recently, teachers have started to use hands-on activities in the classroom along with cooperative group work. At the elementary level students use manipulatives frequently, but it is unclear how often they are used in the high schools. There are two convincing benefits to using hands-on instruction in the classroom. First, student achievement can increase; and secondly, student attitudes can become more positive.

In one study performed at an elementary school, two third grade classes were used to determine if student achievement would increase with the use of manipulatives. For a series of Geometry lessons, one class was taught with only a textbook, while the other class used drawings, diagrams, and manipulatives for instruction. After a pre-test and post-test were administered to both classes, results found that the class which used only the textbook for instruction scored lower than those who were taught visually (Chester, 1991).

Some studies found that student achievement improved with the use of manipulatives. However, while achievement may be one reason to use manipulatives in the classroom, changing student attitudes may be another. Mitchell (1999) studied student attitudes towards mathematics in an elementary school. In a pre-test, she found that students did not associate mathematics with enjoyment and also found no "real-world" use for mathematics. The teacher then implemented hands-on activities in the math lessons for several weeks. Afterwards a post-test found that students' interest in math had increased. They also believed that math was important to their future (Mitchell, 1999).

With the improvement in student attitudes and some increase in achievement one might conclude that manipulatives would be used in most lessons. However, that assumption would not be correct. At the elementary level, a sample of 87 teachers were asked to complete a questionnaire asking how familiar they were with certain manipulatives, and the availability and use of manipulatives in the classroom. The results showed that most teachers were very familiar with using manipulatives and that they were available at the school. However, actual use of the manipulatives was rather low with respect to the degree of availability and familiarity. Interestingly, this study found that teacher competency was one of the main factors that contributed to consideration in using manipulatives to teach math (Hatfield, 1994).

Although some research has been done on how teachers in the high school use hands-on activities, there is much more that is still unknown. Research does show that there are many different learning styles and that teachers should try to incorporate appropriate lessons for all learning styles. Using hands-on activities in the classroom is one such way to do this. Because Geometry is such a visual subject, teachers may use more hands-on materials in this class as opposed to Algebra courses. This study looked at how teachers used manipulative and hands-on activities in high school Geometry classes.

Methodology:

Geometry teachers at all eight public high schools in Forsyth County, North Carolina were asked to participate in this study. Of the teachers who volunteered, one teacher from each school was randomly selected and interviewed and included in this study.

Interviews were conducted at the teacher's convenience during their planning period or after school. The interviews took place in the teacher's classroom, or in the school office, or in the teacher's workroom. Each interview lasted approximately ten to fifteen minutes. The

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following questions were asked in the interview: "When you are teaching Geometry: Are hands-on lessons used? Are manipulatives used more by the teacher or student? Do you assign projects? What technology is used in the classroom? Other than the book, what other materials are used?"

Results:

Once the data were collected from all eight teachers it was organized into different subtopics. The first subtopic was looking at which manipulatives were reported by these teachers as being used in their Geometry classrooms. Seven types of manipulatives were reported by the teachers, including compass, protractor, geoboard, tangrams, patty paper, paper folding, and everyday items (spaghetti, cups, string, etc.). The following graph shows the frequency of manipulative use reported by all the teachers interviewed.
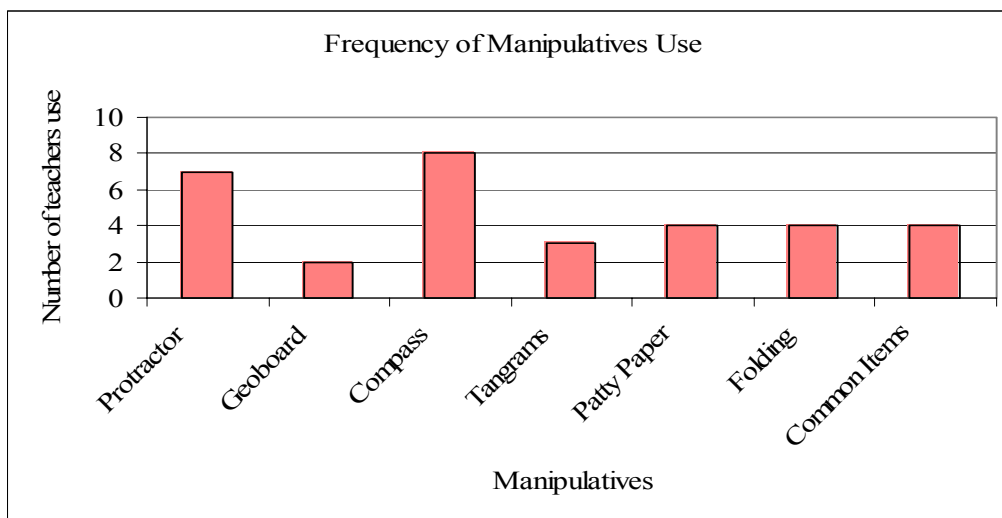
From the above graph it is easy to see that the compass was used by every teacher interviewed. Also, the protractor was used by most every teacher (7 out of 8 or 87.5%). One teacher stated that "manipulatives aid in presenting material in different ways" and by using manipulatives it gives the students "more options, which helps to include all students". 50% of the teachers reported using Patty Paper, Paper Folding, and Common Items in the classroom. Common Items included anything from string, straws, pick-up sticks, spaghetti, and more. From the interviews, teachers offered different reasons for why manipulatives were not used more often in Geometry. 50% of the teachers stated that one reason for not using them was due to availability. Either the school did not have these manipulatives or the school did not have the funding to purchase them. Furthermore, 50% of the teachers agreed that time was another reason why manipulatives were not used in Geometry classes. One teacher stated that because of End of Course testing, there is

not enough time in the year to incorporate manipulatives and that the "students are the ones who suffer in the long run". Other reasons for not using manipulatives expressed by only one teacher each included larger classes, the belief that students will use manipulatives as a toy rather than a learning tool, and the belief that students will be bored.

This study also compared the manipulative use between the eight teachers interviewed. Below is a graph showing the results.
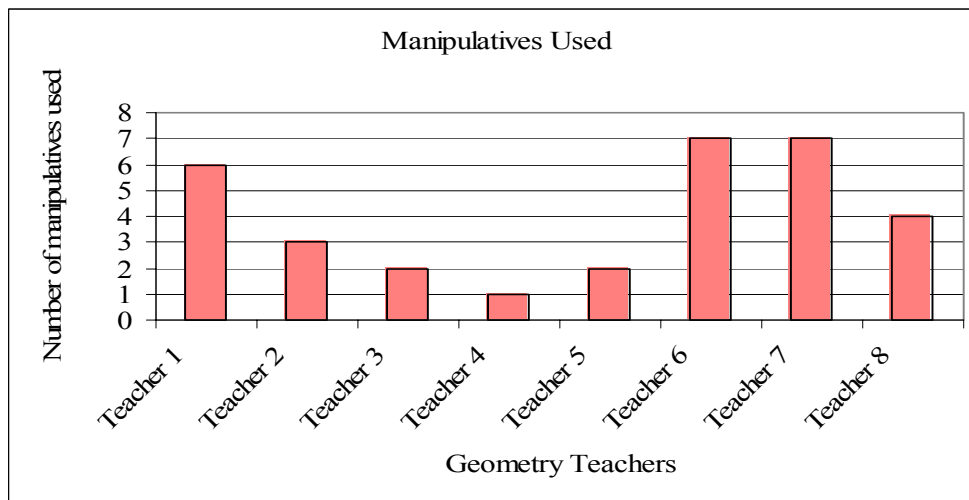
It can be easily seen that only two of the teachers used all of the seven manipulatives. Yet, Teacher 1 and Teacher 8 both used 50% or more of the manipulatives. Teacher 2 used 42%, while Teachers 3 and 5 used 28% and Teacher 4 used only 14% of the manipulatives in the classroom. Overall the data was split. 50% of the teachers used less than half of the listed manipulatives in their Geometry classes. In half of the classes where teachers used a variety of manipulatives, the students used the manipulatives more. However, in classrooms where teachers did not use as many manipulatives, the manipulatives were mostly used by the teacher for demonstrations or not used at all. These teachers stated this was because of the time factor and that it was faster for them to demonstrate using a manipulative rather than passing out the manipulatives and allowing students to explore.

Using technology in the classroom was also incorporated into this study. Types of technology used in Geometry classrooms could have included Graphing Calculators, Geometer's Sketchpad, Internet, Test Generator Software, and other Software Programs. The data showed that every teacher used the Graphing Calculator. Also 50% or more of the teachers used the Internet and Test Generator Software. However, only 14% (one teacher) used other software. Furthermore, not one teacher had used Geometer's Sketchpad. Most teachers agreed that this was

due to lack of availability; however, one teacher did not like the program and stated that they would not use it in the classroom even if it were available for use. Of the 5 different types of technology only three teachers used more than 50% in their classroom. If the calculator was not included, then 25% of the teachers would not have used any technology in their classroom.

This study also looked at whether teachers assigned projects outside of the class that involved hands-on materials. There was no relationship between the teachers who used manipulatives frequently and those who assigned projects outside of class. The last part of this study looked at where teachers get other resources. Every teacher who was interviewed used the Internet for extra worksheets, activities, or lesson plans. Most of the teachers (75%) used a variety of previous Geometry textbooks that the school had once used. Most of the teachers (75%) admitted to using materials given to them from other teachers in their school. Other resources for lessons and activities came from magazines, workbooks, and old EOC tests.

Discussion:

The data from this study involving teacher-reported manipulative use was divided. Either the teacher enjoyed using manipulatives in the classroom and used them often, or the teacher felt that manipulatives did not belong in a high school Geometry class. This result also showed up in the incorporation of technology in the classroom. Even though only one teacher from each school was interviewed, similar results may be found for other Geometry teachers at the same schools because of the high number of teachers who use other teachers as resources. Further investigation would include interviewing more teachers to obtain a larger sample. Also, finding out student attitudes towards the use of manipulatives in a high school Geometry class would be interesting. Such a study would be significant and could impact teaching styles in the Geometry classroom.

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Student Gender and English Class Participation

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One of the most significant struggles the high school English teacher faces today is the challenge to engage every student, regardless of their diverse backgrounds and interests. In recent years, the effect of student gender on a student's quality of education has been a concern among educators and administrators. Since the 1996 establishment of the Commission on Gender Issues in English Teacher Education, the National Council of Teachers of English (NCTE) has officially acknowledged the persistent existence of gender issues in the English classroom. Among the concerns to be addressed by the commission is the need for teachers to be sensitive to the "gendered nature of schools" and the consequent effects of that gendered environment both on teaching styles in the English classroom and on male and female students (Pace, 2002, p. 244).

Review of Literature

Recent studies about English classrooms have been confirming the legitimacy of the NCTE's apprehension about issues of gender in schools. In a study conducted on teacher-student classroom interactions in Canadian high schools, Duffy, Warren, and Walsh (2001) revealed that both male and female English teachers interacted more with male students than female students. A similar study conducted in Swedish math and Swedish classrooms arrived at slightly different results (Einarsson & Granström, 2002). The study found that male secondary school teachers initiate interaction with male and female students with the same frequency. Einarsson and Granström are careful to point out, however, that during their observations, male students initiate interactions with their female teachers more frequently than with their male teachers compared to girls. Despite conflicting specifics, both the Canadian and Swedish research ultimately found that boys enjoy more teacher interaction than girls in secondary schools.

A crucial component to this teacher-student interaction is teacher-posed questions, because they are an essential element of students' learning process. Questions can encourage

"critical thinking skills, creativity, and higher level thinking skills" for students (Shaunessy, 2000, p. 14). Considering the indisputable power of questions in a classroom, the findings are striking from a study that included the significant issue of teacher-posed questions in an analysis of the difference between male and female students' experiences in British secondary schools (Younger, Warrington, and Williams, 1999). The study explicitly proposes that teachers themselves may be responsible for the discrepancy between male and female students' participation. Although all teachers denied in interviews awareness that they asked questions more of one gender than another, 62% of teacher-posed questions were directed to boys.

All of these studies seem to corroborate Sadker and Sadker's argument that "[t]oday's schoolgirls face subtle and insidious gender lessons, micro-inequities that appear seemingly insignificant when looked at individually but that have a powerful cumulative impact" (p. ix). Not only are girls affected by schools' gendered atmosphere, but sexism "is a two-edged sword: It damages boys as well" (1994, p. xi). Each time a teacher asks a question in class, he or she has both an opportunity to involve a student in the lesson and to send a message, however subtle, about gender. John Dewey commented on the power of questioning: "What's in a question, you ask? Everything. It is the way of evoking stimulating response or stultifying inquiry. It is, in essence, the very core of teaching" (Milner, 2003 p. 22). Perhaps high school English teachers' increased awareness of and sensitivity to the nature of and frequency of questions directed toward male and female students will work to narrow the gender gap in English education and "[evoke] stimulating response" from both males and females alike.

Methodology

The participants of this research were four teachers of regular, or honors English classes and their sophomore, junior, and senior students at a suburban high school in the southeastern United States. A non-participant observer studied each of the four participating teachers' classrooms ten times over a two-month period. The purpose of the observations was to examine the role student gender plays on English class participation.

As the researcher collected data about student participation, students' identities were not recorded and thus remained anonymous. The researcher also protected the identities of the teachers by assigning each teacher a letter (Teacher A, Teacher B, etc.).

The data recorded during class observations by the researcher involved an initial tally of the sex of students in attendance for each class. Once class began, every time the teacher posed a

question that required an individual student's answer, the class's response was recorded in a three-column table (*Figure 1*). One column was used to record the frequency with which male students volunteered answers by raising hands or calling out, while another column was used to record female students' volunteering of answers. The sex of the student whom the teacher called on to answer the question was indicated by a circle around the number of hands raised by that sex for the particular question. The third column was used to record instances in which the teacher called on students whose hands were not raised. In addition to field notes about gender, the researcher also recorded the general nature of the lesson, whether grammar, literature, history, vocabulary, or writing

Figure 1:

Male	Female	Notes

Because this study focused on the effects of student gender on responses to teacher-posed questions, only those classes in which teachers asked questions that required responses of individual students were included in the data analysis. `This data provided the basis for the analysis and results of this study.`

Results and Conclusions

Each of the four teachers observed in this study posed questions to his or her students about a variety of topics, including literature, history, writing, grammar, and vocabulary. Students' gender seemed to affect the rate with which students volunteered answers and the frequency of opportunity for students to share individual answers with classmates. Therefore, an analysis of students' interest in participation and teachers' decisions about which students warrant an opportunity to supply answers aloud is essential for a better understanding of the dynamics of gender in the high school English classroom.

Teacher A asked questions of his or her students that required an individual student's response during two of the observed classes. Pertinent data appears below in *Chart 1*:

Chart 1:

	Male Student Attendance	Female Student Attendance	Questions Asked	Involuntarily called upon Males	Involuntarily called upon Females	Male Volunteers	Female Volunteers
Class 1:	9	18	9	0	2	12	6
Class 2:	10	19	38	0	1	31	41

Teacher B posed questions that required individual students' response more frequently than Teacher A. Pertinent data appears below in *Chart 2*:

Chart 2:

	Male Student Attendance	Female Student Attendance	Questions Asked	Involuntarily called upon Males	Involuntarily called upon Females	Male Volunteers	Female Volunteers
Class 1:	8	18	6	3	3	0	1
Class 2:	13	12	5	3	2	2	0
Class 3:	15	12	12	0	0	17	4
Class 4:	13	8	36	0	1	37	11
Class 5:	9	17	13	0	0	11	22
Class 6:	16	10	17	8	5	5	8
Class 7:	9	17	25	2	0	6	24

Teacher C posed questions that required individual students' response in three of the ten observed classes. Data collected during Teacher C's pertinent classes appears below in *Chart 3*:

Chart 3:

	Male Student Attendance	Female Student Attendance	Questions Asked	Involuntarily called upon Males	Involuntarily called upon Females	Male Volunteers	Female Volunteers
Class 1:	15	5	1	1	0	1	0
Class 2:	13	15	4	1	0	7	1
Class 3:	15	11	8	5	0	3	0

Teacher D's classroom is unique in that Teacher D rarely asks questions that require individual students' response. Teacher D instead opens questions up to the entire class for a whole class discussion in which students answer Teacher D's questions jointly. Four of Teacher D's ten observed classes lent themselves to this kind of class discussion format. Data collected during those classes appears below in *Chart 4*:

Chart 4:

	Male Student Attendance	Female Student Attendance	Questions Asked	Involuntarily called upon Males	Involuntarily called upon Females	Male Volunteers	Female Volunteers
Class 1:	8	20	Conversation	0	0	2	5
Class 2:	13	14	8	0	0	4	16
Class 3:	8	20	Conversation	0	0	2	14
Class 4:	18	10	7	1	2	17	2

Upon analysis of the above data, the frequency with which students of both genders volunteer answers seems clearly related to which gender the student a teacher calls on will be. Teachers need to be sensitive, however, to when and why each gender responds, because as reflected in this study and in prior research, most teachers have a disproportionate number of answers supplied by males. Perhaps the exception to this observed in Teacher D's classes can be explained by Teacher D's focus on literature. A definitive trend toward females' interest in the more subjective world of literature rather than the more objective world of grammar, vocabulary, and writing skills that males seem to respond to cannot be established by this study, however, due to the lack of data concerning literature in Teacher A's classes and the unusual statistics gathered from Teacher C's classes.

Further studies could investigate a larger sample size of teachers and students for a longer period of time. A larger study could explore the existence of a relationship between teacher gender and the frequency with which a teacher asks questions of male and female students. A need to maintain confidentiality in this smaller study, however, prevented an analysis of the effects of teacher gender. A future study could also examine more closely the effects of the structure and content of teacher-posed questions on gendered student participation.

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Teachers' Choice:

Factors that Influence the Decisions about Teaching Christianity in World History

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Introduction

As a moral code, as an individual or community ritual, and as law, religion has influenced societies and their cultures throughout history. As a way to help ensure that religion is not overlooked in school curricula, both state and national standards have codified its study. The growth of religious diversity in America, the personal nature of religion, and the separation of church and state all appear to the researcher to be factors that teachers consider when determining how to teach Christianity to students. It is the purpose of this study to determine what teachers themselves believe influence their decisions concerning teaching Christianity in their classrooms.

Review of Literature

The literature review looked for factors that researchers had found to be important determinants in teaching Christianity and religion and three main determinants were found. The first determinant analyzes how educators address Christianity within historic or current issues and particularly focuses on the issue of the separation of church and state. The findings show that separation of church and state is in the best interests of education and the United States, but only Doerr (1998) believes it will fail within an academic capacity (Glanzer, 1998; Haynes, 1998/1999; Moore, 1995; Risinger, 1993; Wright, 1999). Researchers and commentators also find that teachers are in general uncomfortable with religious topics and specifically uncomfortable with the tension existing in American society between the separation of church and state (Doerr, 1998; Douglass, 2000; Haynes, 1998/1999; O'Neil & Loschert, 2002; Risinger, 1993; Wright, 1999).

The second determinant examines Christianity as a community issue, closely linked with the establishment clause, which is addressed by teachers, students, parents, and administrators. Glanzer (1998) finds through the study of court cases that students' religious rights are overlooked in schools and he argues that "such cases represent only a fraction of the real-life conflicts that make it to litigation" (p. 220), Doerr (1998) disagrees and states that "the occasional violations of student rights, like 'man bites dog' stories, are few and far between…" (p. 224). The contradictory reports show no consensus among researchers as to what the general community supports.

The last determinant investigates Christianity and its treatment by textbooks and curriculum. Douglass (2000) and Risinger (1993) find that most state and national standards have adequately included religion and Christianity as topics of study. In regard to history textbooks, Bellitto (1996) finds that religion and Christianity are not sufficiently covered and that "nebulous or inadequate explanations about religion abound in history textbooks" (p. 274).

Methodology

A convenience sample of seven local high school history teachers (identified as Teachers L through R) participated in the study. All the participants taught World History for at least one school year prior to this study in a suburban school district in a Southern state. They are recruited by means of a fifty-word synopsis email, which is sent to every Social Studies teacher in the district.

This study uses personal interviews between the researcher and teacher. This interview format is chosen because it allows for a focused and thoughtful response from the participants. Data is collected during the interview and teacher answers are typed by the researcher on a computer. Through careful readings, themes emerge in the data and it is systematically categorized into groupings based on key words or phrases.

Results and Conclusions

The analysis of this data generated four categories that documented the perceptions teachers had concerning their allocation of time and coverage of Christianity: 1) Historical or Current Issues 2) Community 3) Curriculum/Textbook and 4) Student Interest.

Teachers noted that within the classroom Christianity was covered in greater depth or with more time if it related to historical or current issues. Teacher P claimed that "most of [what I cover] is historical events in Christianity, such as the Edict of Milan [or the] Crusades." Teacher Q also placed religion within "modern day conflicts, bringing [students] up to the modern day."   For four out of seven teachers, the intersection between religion and historical or current issues caused the teachers to believe that there was an increase in the amount of time or depth of coverage given to Christianity.

As a facet of the historical and current issues theme found in the analysis of the data, the participants were clearly divided on how ideas about the separation of church and state affected their teaching of Christianity. Four teachers reported it impacted their teaching, while three teachers cited no impact. Three of the four teachers cited open-minded discussions and presentation of the material as ways of ensuring they are not crossing any boundaries. The fourth teacher who believed this issue affected the teaching of Christianity spoke of the issue in terms of what the community wanted.

This change in perspective concerning the debate on the separation of church and state identified the second theme in this study, community. For the teachers interviewed, pressure to teach Christianity in a specific way was said to come from the community, composed of students, parents, and colleagues. Four out of seven teachers discussed where this pressure came from. The community exerted pressure that Teacher O tried to meet because of the desire to please others. Teacher R, on the other hand, specifically noted that "in this particular community, those pressures come from the portions of the 'Bible Belt' South, the conservative part. It is a strong coalition in this city."

Another pressure teachers discussed, and the third theme that emerged in analyzing this data, was curriculum and textbook demands. Three of the participants connected curricular considerations to their decisions about how much time would be spent focusing on Christianity. As Teacher M succinctly put it, "…probably the number one thing, as with everything, is the Standard Course of Study."

While curriculum and textbook concerns were a priority worth mentioning by three teachers, four out of seven teachers indicated that students' interest in and familiarity with Christianity influenced their decisions concerning allocation of time and depth of coverage of this topic (refer to Figure 1). Within the final theme, student interest, it was found that three of

the four teachers devoted more time or depth of coverage to Christianity because, as Teacher N stated, "…there are so many [students] that have the Christian base, that you feed off their personal experience, that you go off of that [to cover other] religions, countries, conflicts." However, one teacher out of the four that cited student familiarity as a motivating factor chose to spend less time on coverage of Christianity. Teacher P stated that there was not "as much [need to go into] detail with Christianity because it tends to be the one [religion] students are familiar with." Teachers M, R, and P all have the opinion that many or most students are familiar with Christianity, but how they chose to use that information in their classrooms differed greatly.

Figure 1.   Student Interest as a Factor in Time Spent Teaching about Christianity
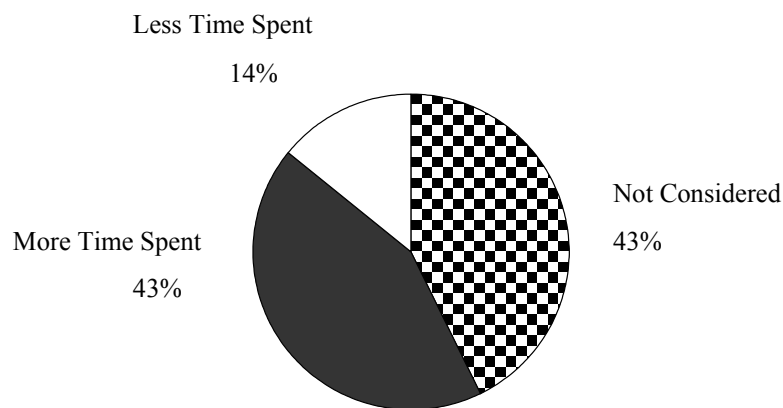
This study searched for the factors teachers believed influenced their decisions about how and to what extent they taught the beliefs and practices of Christianity. The four themes that emerged from this study were universal themes that could be applied as easily to religion as to another topic, such as war. Overall, teachers tailored their instruction of Christianity to fit with historical or current events that teachers wanted to cover in class, to adhere to community demands, to meet textbook and curriculum standards, and to respond to the interests of students. Adhering to the curriculum, for which teachers are hired and expected to teach, and the quality of coverage in a textbook, which students will read, are two issues teachers daily encounter. Likewise, teachers who wish to keep students engaged in the material will take student interest into account and adjust lessons to maximize it no matter the topic covered. In the discipline of social studies many historical events are covered and often current events are also incorporated, so it should be no surprise that a theme, such as Christianity or religion, would easily integrate

itself into lessons covering historical or current events. The community opinion of Christianity, like other issues, also influences the students' response to the topic, the teacher's comfort level with the topic, and how it is taught in the classroom. The four themes that emerged from this research represent not only a way in which to view the teaching of Christianity, but even more broadly they are representative of factors that influence the teaching of all social studies content.

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Wrong Answers and Raised Hands:

The Relationship between Teacher Responses to Wrong Answers and Class Participation

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Introduction

Interaction between students and teachers often revolves around a series of questions and answers. Teachers supply questions for their students in many forms – on tests, as essay prompts, and in classroom lectures and discussions. Students, in turn, are always answering these questions, sometimes readily and enthusiastically, other times hesitantly and without conviction. Often, the answers that the students give are satisfactory – the teacher is happy that the students were able to answer their question, and class moves on. However, many times the answer the student gives is "wrong" in some way; it is inadequate, not factual, or otherwise inappropriate. In this case, the teacher responds in order to eventually present the answer that she wants to hear. It is the manner in which teachers respond to these "wrong" answers, and the corresponding willingness of students to answer questions, that this research intends to address.

Literature Review

Student participation in high school English classrooms seems to be minimal in many classes. In many cases, the teacher does not expect or plan for student discussion, while in other classrooms, students hesitant to contribute to class discussion thwart a teacher's plans for a lively dialogue. Haberman (1995) concludes that as children advance in school, they become increasingly "less willing to try for fear of making mistakes and being embarrassed in front of their peers" (p.76). Researchers such as Nunn (1996) would argue that active participation on the student's part is essential to actually learning anything in the first place. Nunn writes, "long-term learning depends on the learner actively processing the material" (p. 245).

Clearly, how a teacher handles her classroom has a great impact on student participation. How a teacher responds to "wrong" answers is one of the teaching acts that sets up the tone of the classroom and can influence how likely students are to actively participate in classroom

activities. Haberman (1995) has generally concluded that the process by which teachers correct children "communicates the notion that mistakes are bad, or shouldn't happen, or causes delays … or are foolish and show that the child isn't thinking" (p.76). Nafpaktitis (1985) and Gall (1984) argue that teachers should first accept student answers as valid even if the answer is not exactly what the teacher was looking for, and use these answers as the basis for further questions that move along the teacher's plan. Rowe (1979) and Borich (1992) have concluded that a significant wait time is the best way to increase the quality and quantity of student answers to questions.

In general, the research indicates that student participation is one of the most important factors in a student's learning. It also argues that certain ways of dealing with student answers, particularly giving students more time to think about their answers, and accepting and validating student answers, are the most effective ways of encouraging further student participation.

Methodology

The participants in this research project were sophomore, junior, and senior English students at a suburban high school in North Carolina. The researcher observed Practical, Standard, and Honors level English classes taught by four different teachers. The teachers were assigned a letter (Teacher A, Teacher B, etc.) in order to keep their identities confidential during data analysis.

Figure 1. Sample Observation Chart

Teacher responses were judged on two criteria – whether the teacher "accepted" or "rejected" the student's answer, and whether the teacher "lingered" with the student or "moved on" to another source in order to obtain the correct answer. The number of each type of response was tallied in an observation chart (Figure 1).

Teacher responses that were categorized as "Accept Answer" and "Linger with Student" were probing statements or questions, which sought to make the student refine or add to an answer that was essentially correct, but not entirely satisfactory, in the teacher's estimation. Teacher responses categorized as "Accept Answer" and "Move On" were responses that

indicated that the student's answer had been correct but incomplete, and the teacher either called on another student or opened the question up to the class in order to complete the original answer. Teacher responses categorized as "Reject answer" and "Linger with student" were responses that indicated to the student that their answer was incorrect, but encouraged the student to answer again. An example of this type of response would be a teacher giving hints to encourage the student. Teacher responses categorized as "Reject Answer" and "Move On" were characterized by the teacher indicating that the student's answer was incorrect and moving on to another student or the whole class for a new answer. Also included in this category were teacher responses that answered the question at hand after rejecting student answers.

Results and Conclusions

The four teachers observed in this study have been assigned letters, A through D, and the general participation levels of each class can be seen in *Table 1*.

Table 1. Student Participation Levels

Teacher	Participation Level
Teacher A	High Participation
Teacher B	Low Participation
Teacher C	Medium Participation
Teacher D	High Participation

Figure 2. Observation Results: Teacher Responses to Wrong Answers
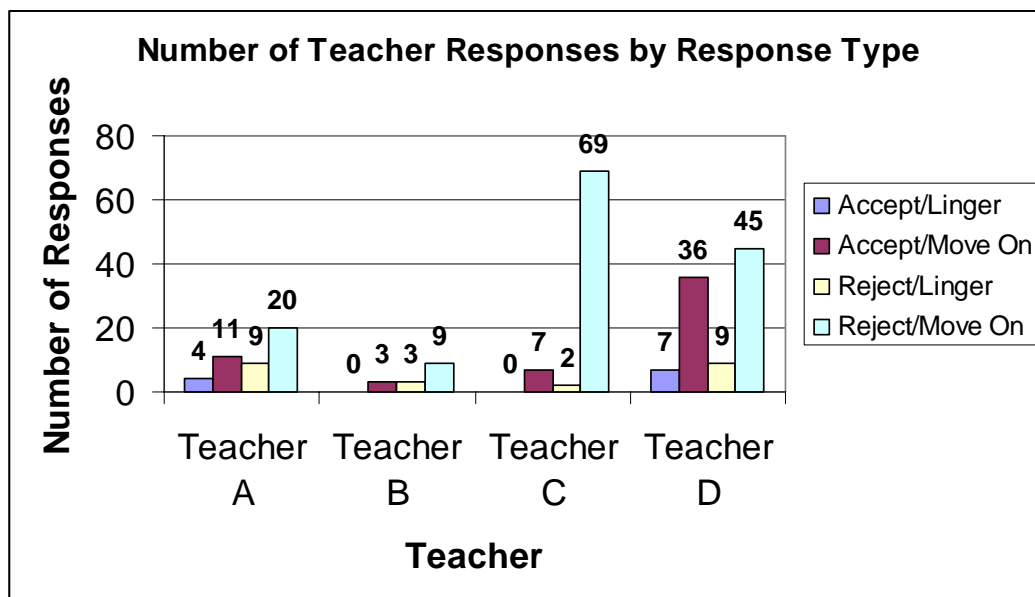
Observations of the four teachers revealed that they differed dramatically in how they responded to wrong answers made by students. The observations (see Figure 2) suggest that high participation levels in a classroom exist in classrooms in which the teacher responds to student wrong answers in a supportive manner, working with the student to improve an answer instead of rejecting the answer outright, such as Teacher A's and Teacher D's classrooms. Additionally, those classrooms which had moderate or low levels of participation were also those classrooms in which decidedly unsupportive teacher responses dominated, such as Teacher B's and Teacher C's classrooms.

Figure 3. Combined Responses for Teachers A, B, C, and D.

Total Teacher Responses by Type
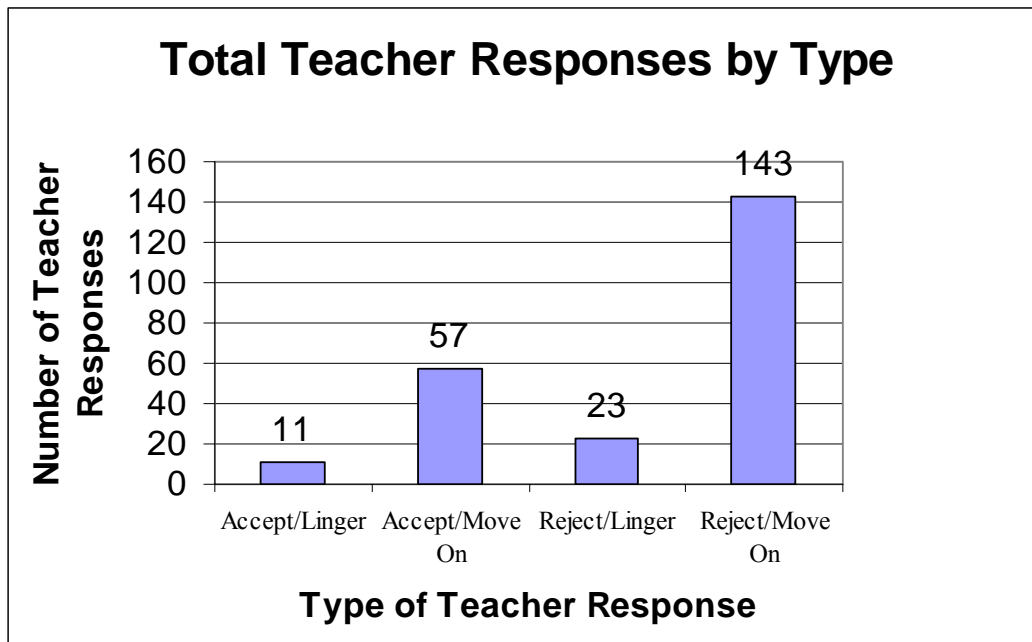
The conclusion that there is a link between supportive teacher responses and class participation is in keeping with the conclusions of the researchers previously cited. It is interesting that although the body of research suggests that "…teacher acceptance of student ideas is positively correlated with student learning gains" (Gall, 1984, p. 44), these four teachers as a group (Figure 3) rejected the student's answer more than twice as often as they accepted the student's answer. Teacher B and Teacher C accepted the student's answer in less than twenty percent of their responses. Additionally, Teacher B lingered with the same student to refine their

answer in less than twenty percent of the responses, while Teacher C lingered with students less than five percent of the responses.

The link that appears to exist between supportive teacher responses to wrong answers and high levels of participation, including a large number of students volunteering to answer open questions, suggests that teachers should do their best to work with students who do answer questions to improve and refine their answers, building confidence in the student that their answers are valuable and are worth improving upon. This study, in combination with the existing research on the subject, indicates that teachers who do use more supportive methods are rewarded by having more students actively participating in class.

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Effect of Instructional Communication Style

on Learning and Attitude in Math Classes

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The topic of this study is how teachers' communication styles affect students' learning and students' attitudes towards learning. Research indicates that the way discussions occur in math classrooms has a great impact on how much students learn. Many people are accustomed to direct instruction where the teacher tells students how to solve a math problem best, while students listen or take notes. In reality, many students do not pay attention to the teacher's lecture or may not understand all that occurs in the process of going over the math problems. For these students, another classroom communication style may be more useful.

Instead of using the typical lecture method, the NCTM Learning Principle recommends a discourse-based approach, stating, "Classroom discourse and social interaction can be used to promote the recognition of connections among ideas" (NCTM, 2000, p.21). In this teaching style, students lead classroom discussions by using previous math knowledge to provide insights about the next step, while teachers guide the students in the correct direction and assist as needed. With such a technique, students may learn the material better, understand the material more fully, and feel better about their abilities to complete math problems.

Review of Literature

Some studies have found that a traditional teaching method is best for teaching mathematics. One study found that the closer a teacher gets to a student-centered discussion, the more disorderly the classroom becomes (Renne, 1996). Forman, Larreamendy-Joerns, Stein, and Brown (1998) found that a discourse-oriented class is attainable, but because of its difference from traditional math lessons, it may be difficult for many teachers to do successfully.

Other research indicated more positive results from a discourse-based approach. One study found that there is a difference between understanding a concept enough to verbally explain it and using that idea to do a math problem (Stage, 2001). Additional research concluded

that students talked and asked more questions with their peers than when talking to the class (Fullerton, 1995). Studies have also shown that discussing and building on their knowledge affects students' ability to learn mathematical concepts (Inagaki, Morita, and Hatano, 2000).

The way a teacher interacts with students in class greatly impacts students' attitudes and achievement. Research has demonstrated that students whose teachers focus on understanding concepts have better attitudes about math than those whose teachers expect them to solve problems optimally (Turner, Midgley, Meyer, Gheen, Anderman, Kang, & Patrick, 2002). A study by Boaler (1998) found that students in project-oriented classes enjoyed math better than students in traditional classrooms because they could work together, choose topics, and solve problems on their own. Other research concluded that students have better attitudes in classes where they contribute their ideas and build on their prior knowledge (Tanner & Casados, 1998).

This study examined how teachers' communication style affected attitudes and achievement of geometry students.

Methodology

Using a cluster sampling method, three geometry classes were selected. Approximately 75 students participated. During one unit, the researcher observed each classroom twice to gauge the teachers' communication style. To quantify this style, a checklist modified from a Student-Teacher Interaction form by Reed and Bergemann (1992) was used. At the end of the unit, students took a departmental test to measure their knowledge of the material and an attitude measure to determine how they felt about the content and how they were taught. The researcher modified this attitude measure from a Mathematics Anxiety-Apprehension Survey by Ikegulu (1998).

The data was analyzed using statistics through SPSS. To determine how teachers' communication style affected knowledge learned in the unit, a One-Way ANOVA was done. A second One-Way ANOVA determined how teachers' communication style affected students' attitudes towards the unit and how they were taught it.

Results and Conclusions

This study was done to determine if teacher's communication styles affected learning and attitudes towards learning in mathematics classes. On this observation measure, a higher score indicated a more discourse-based communication style. Values are presented in Table 1.

Table 1. Communication Style Scores

Teacher	Overall Communication	Group Communication	Individual Communication
1	56.41	54.78	41.18
2	100.70	65.00	137.33
3	76.51	77.94	65.08

Looking at the effect of teachers' communication style on student achievement, means and standard deviations for test scores are in Table 2. In a one-way ANOVA, there was not a statistically significant difference between test scores of students with teachers having different communication styles $F(2, 31) = .532$, $p > .05$. Therefore, the achievement of students did not vary significantly between those who had teachers with different styles of communicating.

Table 2. Mathematics Achievement Scores

Teacher	Number of Students	Mean	Standard Deviation
1	5	77.60	19.970
2	17	69.12	23.861
3	11	64.73	23.234

These results conflict with prior research, which has shown that communication can affect how well students learn in math classes. Research has shown that the chance to participate in discussions and build on knowledge affects students' ability to learn to develop mathematical concepts (Inagaki, Morita, and Hatano, 2000). Other studies show that communication opens up discourse between students and the teacher, allowing students to use prior knowledge to construct mathematical arguments (Lampert, 1990; Yackel & Cobb, 1996; Zack, 1999). Thus, communication during class may be key for learning, as students can build on their knowledge.

One reason that students in this study may have learned equally well is that these teachers used various amounts of discourse, but none truly used discussions or group exercises, as prior studies showed was valuable. If there was not enough difference in communication styles and students could not use discourse, this would have reduced differences in student achievement. Another possibility for why students in this study may have learned equally well is that student achievement may have depended little, if any, on the way their teacher communicated. In particular, students may have understood the information no matter how their teacher explained

it to them. An additional explanation is that students may have all had prior exposure to the material in the unit, so that the way their teacher taught the material did not impact their understanding. Future studies on this topic could include a pre-test on the material.

Additionally, this study examined how teacher's communication styles affected students' attitude toward math. Means and standard deviations of attitude values are in Table 3. Using a one-way ANOVA, there was not a statistically significant difference between student attitudes with teachers using a different communication style $F(2, 31) = 1.189$, $p > .05$. Thus, even though teachers used different communication styles, attitudes of students did not vary significantly.

Table 3. Mathematics Attitude Questionnaire Values

Teacher	Number of Students	Mean	Standard Deviation
1	5	51.80	8.167
2	17	51.65	9.420
3	11	47.00	5.848

These results are also counter to those found in other research, which showed that communication affected student attitude. One study found that students whose teachers focused more on understanding the concepts than on performing tasks were more motivated (Turner, et al., 2002). Research also found that students who did project-based work saw meaning in the material, and enjoyed it better, than students who learned by a traditional teacher-focused communication style (Boaler, 1998). Another study found that using structured communication could lead to positive attitude when students discussed concepts together, because they had the chance to build on their prior knowledge, which gave them feelings of self-efficacy (Tanner & Casados, 1998).

There are many reasons that students' attitudes may not have varied in this study. One explanation is that students' attitudes are not affected, or are affected little, by the way their teacher's communicate. An additional reason is that students did not have access to group or discussion-based activities, which the previously discussed studies found was important. Another alternate idea is that students' attitudes may have been formed for reasons other than the teachers' communication style. This seemed to be the case for some students who believed math was about memorization and tuned out communication during problem solving (Tharp & Uprichard, 1992). Thus, it is important for students to engage in and realize the goal of classroom communication, which students in this research did not.

Some other explanations for why the achievement and attitude scores did not differ greatly revolve around the limitations of this research study. Perhaps more teachers could have been studied or the teachers could have been observed more. Additionally, more students could have been studied. Future studies should focus on larger samples with more representative data.

From this study, one could conclude that teachers' communication styles do not largely affect students' achievement and attitudes. This finding could shift focuses to presenting the material logically or finding good activities instead of emphasizing structuring communication. Additionally, it could cause people to question discourse-based instruction. However, readers should consider limitations of this study and conclusions of prior studies. Further research using these suggestions could indicate that classroom discourse, and particularly the communication of the teacher, affects how well students learn and the attitudes students have towards that learning.

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The Integration of the Communities Standard in Secondary Level Spanish Instruction
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Our global society calls upon foreign language teachers to recognize the relevance of foreign languages in our modern world and to expose students to language communities beyond the classroom. In 1996, in order to bring uniformity to foreign language education, the American Council on the Teaching of Foreign Languages (ACTFL) created the *Standards for Foreign Language Learning* (ACTFL, 1996). The five goal areas outlined in the *Standards* are Communication, Cultures, Connections, Comparisons, and Communities (ACTFL, 1996). Foreign language education should encompass all of these goals in order to produce students who are highly proficient in a foreign language. In particular, the Communities Standard addresses the need for language learners to connect with authentic foreign language communities and to learn the language in authentic settings. The Communities Standard consists of two parts: "Standard 5.1: Students use the language both within and beyond the school setting." "Standard 5.2: Students show evidence of becoming life-long learners by using the language for personal enjoyment and enrichment" (ACTFL, 1996, p. 64-66). By stressing community involvement and life-long learning, these standards emphasize the critical need for today's students to be proficient in more than one language and thus to be adequately prepared to live and work in our multilingual world.

The Hispanic community can be made accessible to all Spanish students. The *Standards* promote opportunities for students to access authentic language communities within the school setting by finding Hispanic peers or using the Internet to obtain keypals. Students can also become involved in Hispanic communities in their own cities or gain access to these communities in cyberspace or through study abroad (ACTFL, 1999).

Today's teachers of foreign language can incorporate technology and community service into their instruction in many of these same ways. Technology such as Computer Mediated Communication (CMC), satellite links, the World Wide Web (WWW), and computer-based media can be used to help students access foreign language communities (Lomicka, 2003;

Overfield, 1997). For example, students can obtain Hispanic keypals, i.e., email penpals, or practice their language in on-line discussion groups. Service Learning or Community Based Learning (CBL), employs community service as a tool to teach students language and culture. Common CBL projects include pairing Spanish students with Spanish-speaking English-as-a-Second-Language (ESL) students or native speakers in the community to work together in tutoring or translation (Overfield, 1997; Wehling, 1999). As illustrated by these examples, the Internet and community service offer students realistic and feasible opportunities to connect with foreign language communities outside of the classroom and to learn Spanish in an authentic environment (Overfield, 2003; Wehling, 1999).

Integrating the Communities Standard into the foreign language classroom is an effective way for teachers to expand the horizons of their students and equip them to deal with the challenges of today's global society. The purpose of this study is to investigate specific ways in which high school Spanish teachers integrate the Communities Standard in their teaching and how they guide students' involvement in the community to enhance their proficiency of Spanish and knowledge of culture.

Methodology

The population for this study consisted of ten Spanish teachers from six secondary schools in a school district located in the Southeast of the United States. The selected schools represent sixty percent of the high schools in the district. The teachers were selected according to their willingness to participate in the study.

The instrument used in the study was a structured interview. The questions were designed by the researcher to examine how teachers integrate authentic Spanish language and Hispanic communities in their instruction to help students develop proficiency in Spanish and knowledge of culture. The chosen teachers participated in one-on-one interviews with the researcher. Forty-five minutes were allotted for the interview; however, no interview was limited to this time. All interviews were audio recorded and transcribed.

**Results, Discussion, and Conclusions**

The information collected during the interviews was analyzed with regard to the teachers' philosophies toward the Communities Standard as an overall goal, their integration of the Communities Standard in their instruction, and the effect of this integration on their students' learning. The following results come from this analysis.

All of the teachers included in the study teach on the seven-period day with fifty-minute classes, except for one who teaches on the block schedule with ninety-minute classes. They teach a variety of Spanish courses ranging from Level One to Advanced Placement(AP) and vary in their teaching experience from two to thirty-two years.

The study showed that only fifty percent (50%) of the teachers interviewed are familiar with the *ACTFL Standards,* and only forty percent (40%) of teachers consciously try to integrate them into their teaching. When asked about the *Communities Standard* specifically, only fifty percent (50%) of teachers are familiar with the Standard, and only forty percent (40%) are able to give a partial definition. However, when teachers were asked how they feel about the ideas behind the *Communities Standard*, one hundred percent (100%) of the teachers support the integration of authentic Spanish and Hispanic communities into Spanish instruction. This is evidenced by their efforts to integrate them into their own teaching (See Table One).
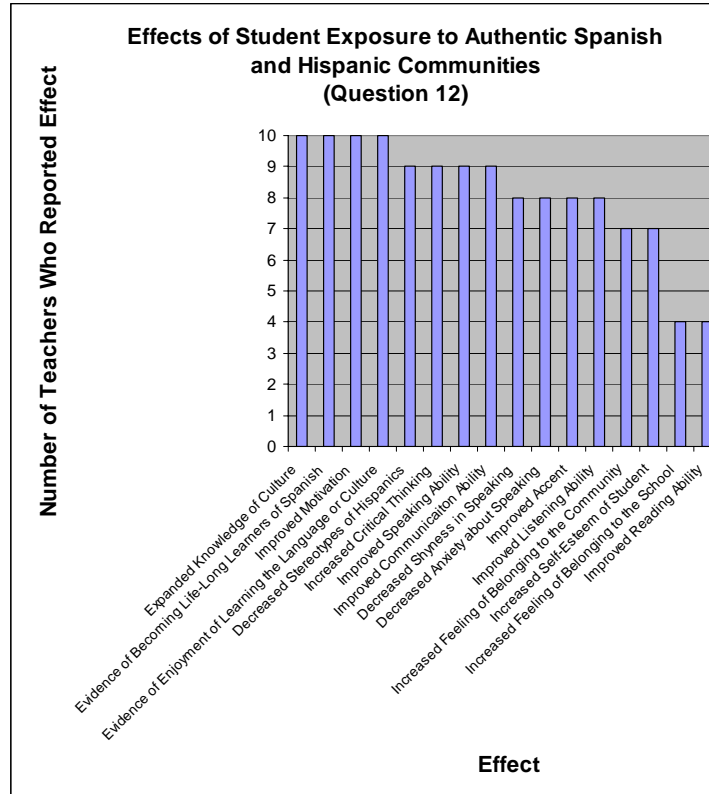
Table One

As shown in Table One, over half of the teachers reported that their students are encouraged to access Hispanic communities in nine different ways. The most popular routes of access include students' use of Spanish in local Mexican Restaurants and students attending/participating in local cultural festivals. Most importantly, one hundred percent (100%) of the teachers interviewed encourage their and to be exposed to authentic Spanish in a minimum of two different ways. (See Table One)

Ways Teachers Encourage Their Students to Access Authentic Spanish and Hispanic Communities (Question Eleven)
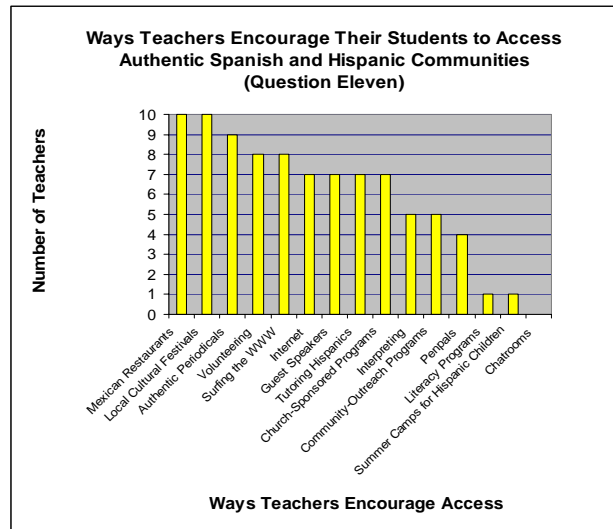
One hundred percent (100%) of the teachers also reported at least four benefits of exposure to authentic Spanish and Hispanic communities for their students. (See Table Two) In particular, teachers saw improved understanding of Hispanic cultures and the Spanish language, improved motivation to learn, evidence of enjoyment of learning the language and culture, and evidence of becoming life-long learners of Spanish.

Table Two

Effects of Student Exposure to Authentic Spanish and Hispanic Communities (Question 12)

A bar chart titled "Effects of Student Exposure to Authentic Spanish and Hispanic Communities (Question 12)". The y-axis is labeled "Number of Teachers Who Reported Effect" and ranges from 0 to 10. The x-axis is labeled "Effect". The bars and their values are:

- Expanded Knowledge of Culture: 10
- Evidence of Becoming Life-Long Learners of Spanish: 10
- Improved Motivation: 10
- Evidence of Enjoyment of Learning the Language of Culture: 10
- Decreased Stereotypes of Hispanics: 9
- Increased Critical Thinking: 9
- Improved Speaking Ability: 9
- Improved Communication Ability: 9
- Decreased Shyness in Speaking: 8
- Decreased Anxiety about Speaking: 8
- Improved Accent: 8
- Improved Listening Ability: 8
- Increased Feeling of Belonging to the Community: 7
- Increased Self-Esteem of Student: 7
- Increased Feeling of Belonging to the School: 4
- Improved Reading Ability: 4

Due to time constraints, most of the teachers in this study integrate the local Hispanic communities into their instruction through extra-credit opportunities. Unfortunately, limited resources prevent many students from taking advantage of these opportunities. Other students who are afraid to use their Spanish outside of the classroom choose not to participate in this optional exposure. For this reason, although all of the teachers in this study value student exposure to Hispanic communities, many students are not exposed to the local Hispanic communities and do not receive the language and cultural benefits gained from this experience.

Conclusions

In conclusion, this research shows that the teachers who participated in this study value the integration of authentic Spanish language and Hispanic communities into their instruction and are aware of the benefits of this exposure. The teachers in this study make efforts to include these communities in their teaching, but are forced by time constraints to offer this exposure as extra-credit rather than a required component of the class. Unfortunately, many students do not

participate in this optional exposure and therefore do not receive the language and culture benefits gained from this experience.

This research study also finds that the teachers interviewed do not feel that their students have access to international Hispanic communities and that their students could better take advantage of local Hispanic communities. The teachers reported frustration regarding the time constraints and lack of resources that limit their ability to integrate local Hispanic communities in their instruction and expressed that they would like to be able to do more. Fortunately, teachers reported that their students have at least weekly access to the Internet, which is a proven resource and tool that teachers with proper training can use to help their students access both local and international Hispanic communities.

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Examining English Teachers' Questions

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Neil Postman (1979) writes in *Teaching as a Conserving Activity* that "all our knowledge results from questions, which is another way of saying that question-asking is our most important intellectual tool." "Badly formed," Postman continues, "[a question] produces no knowledge and no understanding. Aptly formed, it leads to new facts, new perspectives, new ideas." Postman calls us to "make the study of art of question-asking one of the central disciplines in language education." This study sought to investigate the art of question-asking in the classroom of four English teachers.

Review of Literature

Educational researchers have long made question-asking in the classroom a subject of close study. In 1912 researcher Rommiet Stevens quantified the average number of questions that teachers ask in a day at 395; of those questions, nearly two-thirds asked students to recall and recite information presented in text materials (Wilen, 1991; Dantonio & Beisenherz, 2001). Since 1912 research in the classroom has continued to suggest that teachers' questions remain a dominant part of the classroom's oral discourse, and that teachers consistently incorporate a recitation method--factual, text-based questions generated by the teacher, answered succinctly and directly by the student, and evaluated by the teacher--as their primary questioning practice (Anderson, 1994; Gall, 1984).

An alternative to the recitation method develops through the use of questions of a higher cognitive level, which invite independent, divergent thinking on the part of the student-answerer. Researchers began to consider in earnest the cognitive level of teachers' questions following the publication of Bloom's *Taxonomy of Educational Objectives* in 1956, and have frequently adapted that taxonomy to analyze teachers' questioning (Anderson, 1994). Researchers have often simplified this taxonomy in their analyses of questions by distinguishing between two types: lower-order (recall and basic comprehension) and higher-order (application, analysis, synthesis and evaluation) (Gall, 1984).

Despite varied results on the affects of different types of questions, most educational theorists still maintain that higher-order thinking should remain the goal of instruction, and that questions remain a crucial tool by which teachers will develop their student's cognitive processes and help raise the level of thought in the learning process (Hunkins, 1972; Wilen, 1991). Applebee (1996) has written that when teachers incorporate what he terms "authentic," higher-order questions students will take more interest in and derive more satisfaction from their work. Such questions encourage students to develop previous learning and build connections between ideas and content.

Research on teachers' questions has revealed the complexities involved in asking questions, and suggests no simple formula or clear design for teachers to incorporate (Dantonio & Beisenherz, 2001; Good & Brophy, 2003; Wasserman, 1992). Dantonio and Beisenherz (2001) insist that questioning sequences invoking a variety of questions yield far more success than any one type or level of question. Good and Brophy (2003) suggest a discourse that combines lower-order questions, to monitor comprehension, with higher-order questions, to stimulate students' thought about content, possible connections, and potential applications; furthermore, questions should not focus on correct answers, but should engage students with the content, helping students make the content their own. Finally, Christenbury and Kelley (1983) offer the model of a conversation with friends for their ideal questioning discourse—a style of discourse that assumes "a topic of mutual interest" and a "genuine give-and-take atmosphere" of authentic dialogue.

Methodology

The research for this study focused on the observation of the classes of four English teachers at a suburban North Carolina high school. Different class levels were observed, and students in all classes represented a range of socio-economic, cultural, and ethnic backgrounds.

During each class observation, the researcher took detailed fieldnotes of classroom discourse, recording all questions orally directed by the teacher to his or her class. Questions designed to promote, enhance, and gauge student learning were recorded; questions relating to classroom procedure or extra-curricular information were disregarded.

The researcher reviewed each question to determine its level: either low or high. A low level question prompted a specified or predetermined answer and/or asked students to recall previously presented information; low-level questions often asked "what," who," or "how

many," or asked students to fill in a blank and complete a sentence started by the teacher. A question categorized as high level did not necessarily have a single specific or correct answer, but asked students "why" or "how;" high level questions generally required more abstract thinking from students, and often generated additional questions or dialogue from both students and teacher. Additionally, the researcher noted as "personal extension" those questions, either low or high level, that asked students to consider their own experience or insight in formulating an answer; such questions asked for students' subjective opinion on a given topic and therefore had no single correct answer.

After cataloging each question as high or low level, personal extension or not, the researcher calculated both the total and average numbers of questions asked by each teacher, further stratifying those numbers according to question types and questions among "regular" or "honors" class levels.

Results and Conclusions

Each of the teachers directed questions toward their students in most all of the classes observed, though certain teachers asked more than others. Teacher B asked the most questions overall, directing 225 questions toward students in the 9 classes observed, for an average of 25 questions per class. Teacher A had the next highest number of questions, 155, for an average of 17.22 questions per class. Teacher C asked 96 questions over the course of 9 classes, averaging 10.67 questions per class. Finally, Teacher D asked 62 questions, the fewest of the four teachers observed, for an average of 6.89 questions per class.

Results varied concerning which class level yielded more questions. Teacher A had a slightly higher average number of questions per honors class than per regular class. Teacher B generally asked more questions in regular classes. Teacher C also asked more questions in regular classes. Teacher D asked more questions in honors classes. All four teachers asked more low-level questions than high-level questions in both honors and regular classes. Teacher A asked slightly more high-level questions in regular classes than in honors classes, as did Teacher B. Teacher C and Teacher D asked more high-level questions in honors classes than in regular classes. All the teachers observed asked few personal extension questions, and results were mixed regarding which class level yielded more of this type of question.

The results do not suggest that teachers necessarily ask more high-level questions in one class level over another; two of the teachers asked slightly more in their honors classes, two

asked slightly more in their regular classes. Had the classes been observed for a longer period of time, the difference between questions asked in different class levels may have proven even slighter. All of the teachers did, however, ask substantially more low-level questions than high-level questions, results that reflect previous studies which demonstrated the prevalence of recitation discourse in the classroom

In most classes observed, high-level questions followed a series of low-level questions that helped prepare the student to build toward higher-order thinking. In one discourse surrounding literature study, Teacher A used questions to build students' comprehension of the text under the study, using low-level questions to highlight specific details and high-level questions to build a deeper understanding of the text. In this same discourse, the teacher also posed several extension questions to connect the text more closely to the student's personal experience. These questions helped to build student confidence in answering the questions, since they asked students to use their own experience to answer, rather than strictly learned facts and the textual context.

Like Teacher A, Teacher B used low-level questions to build students' ability to answer more divergent questions. The teacher helped to increase comprehension through both the recall of specific details and exploration of the meaning behind these details. Teacher B also incorporated several extension questions in this discussion, which helped to build student involvement and confidence.

Teacher C, who asked fewer questions overall than Teachers A and B, generally used questions more sparingly and at more controlled pace. In one instance, Teacher C grouped a series of high-level questions together at the beginning of an honors English class, asking no further questions the rest of the period. The questions were designed to help students develop ideas for an analytical paper; students had to generate their own lower order questions in their essay writing to back up the higher-order thinking that these questions required.

Teacher D asked the fewest number of questions overall and asked only ten high-level questions during the course of the study. Most of the high-level questions arose during discourse relating to the study of literature or film, and generally occurred among a series of low-level questions. As with other teachers, this teacher used both high and low level questions to build comprehension of the text (in this case a film) under study.

Discourse surrounding the study of literature, as in the examples above, generally incorporated more high-level questions and extension questions than did the discourse of a vocabulary or grammar lesson. In a lesson designed to impart specific skills or knowledge, as is typical for vocabulary and grammar lessons, it would be expected that questions would tend toward a lower-order, asking students to recite and recall certain facts. Examples of questions in vocabulary lessons ranged from explicit calls for definitions to personal extension questions. By using extension questions in a vocabulary lesson, the teacher helped to attach the word's meaning to personal experience and turned a purely recitation-type discourse into discourse with the possibility of divergent, free responses from the student. So while high-level questions may be less appropriate for such lessons, use of extension questions helps provide space for the student's voice in an otherwise teacher-centered lesson.

Bearing in mind its limited scope over a relatively short period of time, this research study confirms earlier studies that found that the majority of teachers' questions are of a lower-order, and generally foster a recitation-type discourse. While high-level questions did occur, and occurred roughly equally among different class levels, their relative scarcity suggests that students are generally not called upon to respond orally at higher-cognitive levels, and authentic discussions occur infrequently. The positive use of personal-extension questions affirms their presence in the classroom; however, the low occurrence of such questions suggests that additional research on and consideration of the value and effectiveness of personal extension questions could prove beneficial.

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Teacher Responses and Student Reactions to the Usage of Non-Standard Oral Language in the English Classroom

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Oral language is a prominent part of any classroom, especially the secondary English classroom. Daily students offer their opinions, relate stories, and answer teacher posed questions. As students participate in class, the way in which they use language is always highlighted. Students generally use slang and dialect in the classroom, but there are also several other conventions of non-Standard language present. While teachers have the ability to empower students with language of power, they also have the responsibility to respect the experiences of their students. How should English teachers respond to non-Standard speech? This study attempts to gather and categorize teacher responses to oral Standard misuses and determine the manners that are most conducive promoting Standard language use in the classroom.

Review of Literature

Much like the neighborhood in which one lives or the type of car one drives, possessing an accent or using a particular dialect can express an individual's socioeconomic status. Inadvertently, language, like neighborhood and personal possessions, becomes a basis by which one individual discriminates against another. One of the most common places to find language discrimination has become the public school classroom. In *Bad Boys: Public Schools is the making of Black Masculinity*, Ferguson (2000) describes the prejudice experienced by black male students as a result of their use of non-standard English or black vernacular English. Instead of the recognizing the cultural significance of the students use of dialect and the lack of standard English usage at home, the educators in Ferguson's study perceived that the student's inability to use standard English was a result of student apathy and resistance to authority.

In her ethnography, *Subtractive Schooling: U.S.-Mexican Youth and the Politics of Caring*, Valenzuela (1999) describes a similar phenomenon to that of Ferguson. Valenzuela's study focuses on the treatment of Mexican American students in Houston, Texas. The teachers in the study did not validate the students' bilingualism, but they classified their inability to speak

Standard English as a deficiency. Because of this subtractive model, students felt subconscious about their accents as well as their use of Spanish to supplement their English and were reluctant to speak in class.

In response to language discrimination in the public classroom, there have been several studies that tackle the issue from the perspective of the teacher. In the 1999 article "Dialect Bias in Questioning Styles in the Standard English Classroom," Strickland concluded that teachers who are aware of their biases and consciously challenge their notions towards language usage, by querying students with advanced questioning strategies tend to create healthier learning environments for students speaking varying dialects.

In order to explore the treatment of non-standard English in the classroom, Wilbur observed the manner in which English teachers taught grammar. His findings ran counter to the work of Strickland. He discovered that teachers in his study taught grammar primarily through reading and writing, which allowed little room for the discussion of dialect. Teachers tolerant of dialects were more likely to facilitate language learning through process-based learning. Although the studies of both Wilbur and Strickland discuss the use of dialect in the classroom, the studies fail to describe explicit teacher responses to non-standard speech in the classroom.

Unlike the previous studies, Wyne (2002) explores non-Standard English usage through student perspectives. In her essay, "'We don't talk right. You ask him.',," she describes her students' unwillingness to address questions to a panel at an area conference. Though the students were invited to attend the conference because of their award winning print journalism, their self-consciousness prohibited them from speaking publicly.   Her example clearly demonstrates the extent of student consciousness regarding language, much of which stems from language discrimination. Wyne's work explains that teacher responses to the use of non-standard English largely impact their students.

Methodology

The participants in this study were sophomore, junior, and senior secondary English students at a high school in Winston-Salem, North Carolina. The students were of varying academic abilities, participating in practical, standard or honors English classes. The students were from varying socioeconomic, racial, and cultural backgrounds. In addition to the students, four English teachers were also observed. Each teacher was considered a master teacher and had been teaching English for a number of years.

The researcher for this study was a non-participant observer. She did not have any direct contact with the students or the teachers. The participants of this study will remain anonymous. Data for the study was gathered over a period of nine weeks; approximately four classes were observed each week. The data gathered from the observations was recorded in the form of field notes. The researcher paid careful attention to language use in the classroom and recorded any incidents of non-standard language use in the classroom. Non-standard language use ranged from incorrect pronunciation to blatant incorrect use of grammar conventions.

In recording the use of non-standard language in the classroom, the researcher focused on students' non-standard usage and the response made to these utterances by their teachers. Each response to non-standard language was recorded and given a letter that described the type of response made. Teacher responses were placed into one of four quadrants that categorized teacher responses that represented the degree of a teacher's acceptance of non-standard use: corrective, permissive, supportive, and punitive. The degree of the response was charted; strong responses were recorded in the top left corners of each quadrant, average responses were recorded in the middle of the quadrant, non committal responses were recorded in the bottom right corners.

Teacher Response to Student Use of Non-Standard Language

	Supportive	Punitive
Corrective		
Permissive		

Results

The researcher, over the course of ten weeks, collected at least eight examples of non-standard language oral use in each classroom observed. In each instance of language interaction, a student used a type of non-standard English. The non-Standard forms included: incorrect pronunciations, use of dialect, slang, and colloquialisms, misuse of tense and vocabulary, the presence of accents, and blatant misuse of grammar conventions. In each recorded instance of non-Standard language, the instructor heard the students misuse and chose to respond or ignore the students' statements. Non-Standard use most often occurred during large class discussions.

The teacher responses were generally directed to individual students, but in an attempt to aid the entire body, the teacher projected comments/corrections of the misuse to the entire class.

Most of the teacher responses were organized into one for main four categories. Teachers repeated students' misuses, rephrased student statements, explained misuse in order to correct, and used slang anecdotally. In general the instructors in the study varied their responses to non-Standard language. The students in the classroom reacted in various ways to the teacher responses.

Conclusion

Based on the data gathered in classroom observations, the research was able to distinguish methods of best practice when responding to student non-Standard language use in the secondary English classroom. Instructors, who recognized and expressed the fluidity of language, were generally more permissive and supportive of non-Standard language use. Their support should not be confused with passivity; they often responded (verbally and non-verbally) to their students' misuse to highlight mistakes, but did not always correct them. They were least likely to correct the student if they felt that the student understood Standard language conventions. The teachers often expressed fluidity of language by using slang and colloquialisms to emphasize a point or relate to their students.

Students received teacher corrections of Standard language misuses well if the teachers allowed the students use non-Standard language as a form of expression. Teachers who corrected blatant misunderstandings of language but permitted the students to generally speak informally in class were usually able to correct student language without complaint by the students. Most importantly teachers who provided enabling structures of Standard language for the students were most successful in addressing non-Standard language use in the classrooms. Instead of immediately giving students the correct pronunciation, tense, or term, teachers who explained misuses and used incorrect speech as an opportunity to empower students with a currency of power provided the best support for their students. In these cases the students generally accepted the teachers' corrections and thanked the teacher for the feedback.

Though the teachers in this study often used slang, dialects, and colloquialisms anecdotally, instructors should be careful not to marginalize the experiences, accents, and speech histories of their students. In using such speech, the instructor could unintentionally deter a

student from orally participating in class. A teacher's playful use of dialect could also incorrectly communicate prejudices toward a specific racial or socio-economical group.

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The Effect of Problem-Based Versus Step-by-Step Laboratory Experiments on the Achievement and Attitudes of Honors and Standard High School Chemistry Students

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Inquiry learning is based on the assumption that students construct meaning from their experiences, so they must be active participants in the learning process. It places the focus on students as explorers with the teacher acting as facilitator and guide (Trowbridge, Bybee, & Powell, 2004). A more traditional method of teaching is based on the assumption that the teacher possesses knowledge and must transfer it to the students in order for them to learn. This method is highly structured and teacher-focused.

Research continues to illuminate the positive benefits of an inquiry-based approach to science teaching. Educators are increasingly recognizing the importance of teaching students the nature of science, which includes science process as well as content knowledge, and the effectiveness of inquiry-based learning in accomplishing those goals. The National Research Council's *National Science Education Standards*, released in December 1995, lists "Science as Inquiry" as one of the six fundamental principles of science content (Trowbridge et al., 2004).

Problem-based laboratories (PBLs), in which students are required to develop their own experiments in a controlled environment, can be an excellent way to introduce students to the process of science. PBLs are often contrasted with the step-by-step or "cookbook" laboratory experiments used most often in science classrooms, which can be less time-consuming and very effective in improving content knowledge. As part of the ongoing effort to provide students with teaching that is both effective and consistent with the nature of science, this study attempts to determine the effect of problem-based versus step-by-step laboratory experiments on the achievement of honors and regular high school chemistry students in two areas: understanding of chemistry content and ability to design experiments.

Review of Literature

Inquiry-based learning has been implemented and studied at the high school level (Schneider, Krajcik, Marx, & Soloway, 2002; Egelston, 1973; Yerrick, 2000). Schneider et al.

(2002) completed a study determining the effect of a long-term inquiry-based learning experience on the achievement of high school students. The high school studied has a three-year project-based science (PBS) curriculum instead of a traditional physical science/ biology/chemistry curriculum. When students at this high school were given a national science assessment, they scored higher than the national average on most of the scientific investigation questions and met the average on practical reasoning questions and other content questions. This indicates that students learn just as much about content through an inquiry-based approach, and they learn more about how to develop and conduct scientific investigations.

Egelston's (1973) study of high school biology students suggested that greater achievement occurs with inquiry-based learning, but only after students have time to become comfortable with the inquiry-based approach. Two groups of approximately 90 students each were given a series of ten laboratory experiments; one series of labs was more traditional, and the other was inquiry based. Students in the traditional group initially achieved higher on lab quizzes, but by the end of the study students in the inquiry-based group were scoring significantly higher on the quizzes. In addition, Yerrick's (2000) qualitative study of a single lower-track general science classroom revealed that after 20 weeks of an open inquiry curriculum, students showed great improvement at exit interviews in their confidence in their ability to answer scientific questions and their understanding of causal relationships.

Shymansky, Kyle, and Alport (1983) conducted a meta-analysis of twenty-five years of experimental research comparing inquiry-based methods to more traditional methods of teaching. They found that overall, students in inquiry-based learning experiences achieved at nearly one half a grade level higher on science content than their peers receiving traditional instruction. However, when studying individual science disciplines, they found that achievement was the least affected in the inquiry-based chemistry programs studied. In a later meta-analysis (Wise, 1996), 140 studies were used to compare the overall effect of alternative teaching strategies and traditional teaching strategies on middle and high school students' science achievement. Students achieved almost one-third of a standard deviation higher with inquiry-based instruction than with traditional instruction.

Inquiry-based learning has been shown to have a positive impact on student science achievement (Shymansky et al., 1983; Wise, 1996; Egelston, 1973; Schneider et al., 2002) as well as student interest in science (Yerrick, 2000). This research seeks to study its impact further

by investigating these null hypotheses: first, that there is no difference in content understanding or experimental design ability between measurement after a problem-based laboratory and measurement after a "cookbook" laboratory; and second, that there is no difference in effect size between honors chemistry students and standard chemistry students for content understanding or experimental design ability.

Methodology

Four intact high school chemistry classes from a public school in central North Carolina, two honors classes and two standard classes, were selected to participate in this study. One standard class and one honors class participated in a problem-based laboratory; the other standard class and the other honors class participated in a "cookbook" laboratory. The day after the laboratory, all four classes took the same posttest. In addition, a maximum of seven student volunteers from each class were given the option to participate in a group interview after the laboratory experience. Those volunteers who returned signed parental consent forms participated in an interview within one day after completion of either the PBL or the "cookbook" laboratory. The students were interviewed regarding their opinions and attitudes toward their particular laboratory experience. A total of four interview sessions were conducted, one for each class. See Figure 1 for a diagram of the study design.
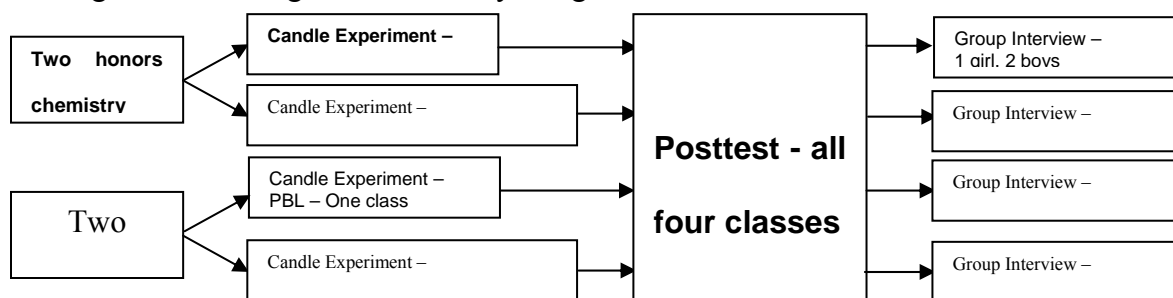

Figure 1. *Flow chart of investigation for laboratory study.*

A PBL, a step-by-step laboratory, and a posttest were developed by the researcher. The laboratory uses an activity with a candle to illustrate vapor pressure as well as the relationship between the temperature and pressure of a gas. The PBL handout was extremely open-ended, whereas the "cookbook" laboratory handout contained clear instructions for students to follow. The posttest, which consisted of twelve items, sought to measure students' observations and understanding of what happened during the laboratory, as well as students' ability to design an experiment for a new problem.

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A rubric was created for the posttest assigning a numerical value to each question. The maximum score for the posttest was 20 points. The maximum content score was 16 points, and the experimental design question was allotted a maximum of 4 points. The posttests were scored according to the rubric, and the numerical data obtained was analyzed using SPSS.

Results and Conclusions

The difference in the means of the content scores was insignificant for both the honors groups ($t = 0.154$, $p = 0.878$) and the standard groups ($t = 0.398$, $p = 0.695$), as seen in Figure 2.
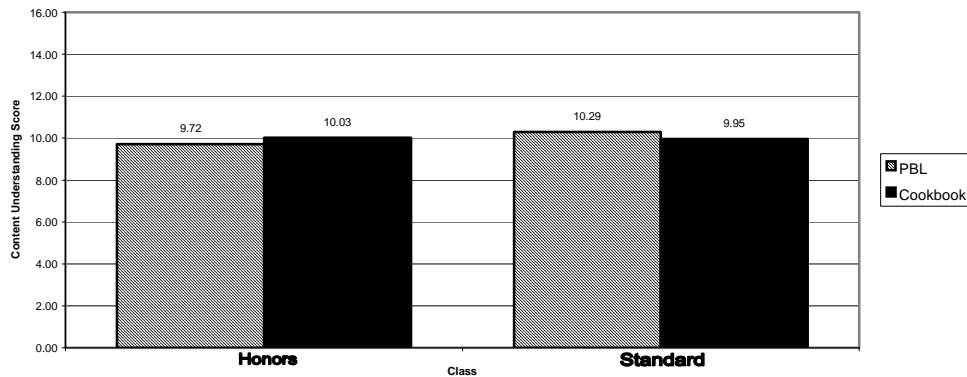

Figure 2. *Differences in mean content scores for all four research groups.*

According to a *t-test*, the honors PBL group scored significantly higher in experimental design than the honors cookbook group ($t = 3.558$, $p = 0.001$). There was not a significant difference in the experimental design score between the standard PBL and cookbook groups ($t = -0.928$, $p = 0.364$). These results are shown in Figure 3.
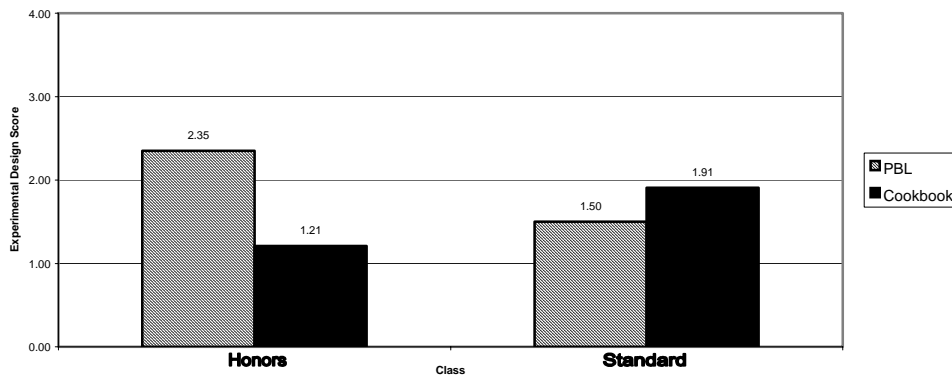

Figure 3. *Differences in mean experimental design scores for all four research groups.*

Factorial ANOVA tests revealed that there was an insignificant difference in effect size between honors and standard students for content understanding ($F = 0.064$, $p = 0.801$) but a significant difference in effect size for experimental design ability ($F = 8.360$, $p = 0.005$).

During the interviews, respondents in all four groups generally expressed positive attitudes toward the candle experiment. The respondents in the PBL groups expressed positive attitudes toward the more open-ended nature of the activity, whereas the respondents from the "cookbook" groups expressed positive attitudes toward the detailed instructions. Some groups responded that they understood more about the relationship between temperature and pressure of a gas after completing this laboratory, whereas other groups expressed their continued confusion.

This research study has shown that achievement in content understanding is not significantly different for a PBL or a "cookbook" laboratory for either honors or standard students, indicating that both types of laboratories can be used in the classroom to achieve understanding of content. Achievement in experimental design ability is significantly higher for honors students who participated in a PBL than for honors students who participated in a cookbook laboratory; there is no significant difference for standard students. This suggests that honors teachers should integrate PBLs into their classrooms in order to increase their students' science process skills, and that teachers of standard students can use PBLs in their curriculum without negatively affecting their students' understanding of science process. Finally, students' attitudes toward laboratory experiences, as expressed in group interviews, are generally the same for a problem-based laboratory than for a cookbook laboratory, and students' perceptions of their own learning do not seem to be significantly affected by the type of laboratory in which they participate.

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Character Education in the Social Studies Classroom

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Introduction

In addition to teaching children to be good students, most teachers are concerned with making sure their students become good people. What, besides the social studies curriculum and content, do teachers hope to impart to their students? It has often been said that there is no such thing as value-free education; indeed, even the absence of specific values or morals would speak volumes to what a teacher, school district, and society value most. Significant, and often heated, debate surrounds the idea of values education in schools today: *Which values should be taught? Whose values should be taught? How should character education be achieved?* For better or worse, the accountability for teaching values or morals in the school setting ultimately falls squarely upon the shoulders of classroom teachers. Teachers in all subjects constantly convey and embody their value systems in their actions, in the selection of reading and classroom materials, and in their reactions to student behaviors. The social studies classroom, however, provides an unmatched opportunity to explore values and ethics as a part of examining the content.

Understanding the position that teachers are in to influence their students, the researcher has undertaken this investigation into teachers' ideas, intentions, and methods; though they might be abstract in nature, these conceptions of character are what will eventually be made manifest as values education.

Review of Literature

Given that ideas of character vary among communities, Bulach's (2002) survey-driven research into the concept establishes a model by which a localized, working definition of character is developed. The character traits cited by the teachers and parents – respect, honesty, and self discipline, among others – were used to refine the focus of subsequent character education initiatives. Related research (Wood, 1999) supports the notion that character can be

locally defined and reports that roughly four-fifths of the school administrators surveyed support teachers in including character education within the scope of the curriculum. Both studies provide sufficient evidence that parents, teachers, and principals all possess ideas of the traits that denote good character, and that all agree it should be taught in the classroom.

Ling, Burman, and Cooper (1998) found that teachers viewed themselves as facilitators of discussion that guided students' thinking about values and character; in addition, they sought to emphasize a balance between individual values and social responsibilities. In a similar vein, Milson and Mehling (2002) reported that the majority of the teachers surveyed felt confident in their ability to serve as positive role models, as well as to address moral and ethical issues in class. Another study (Veugelers & de Kat, 2003) reported that students, parents, and teachers all regarded the communication of character in the classroom as crucial to supporting students' values clarification, though students were less supportive of teachers' efforts to directly impress values upon them.

Firmly grounded in the preceding literature that describes initiatives and outcomes of character education, the present research study seeks to find a qualitative understanding of how teachers consider character, what they believe about values education, and how those impressions inform and direct their efforts in the classroom.

Methodology

The insights of teachers are of principal interest to my study. The explication and interpretation provided by these teachers was analyzed to answer the essential question of the data study. This research was accomplished by employing qualitative methods of data collection and analysis to render an ethnographic interpretation of character education in the classroom. In selecting the participants for my research, an open letter explaining the purpose of the study was sent to every social studies teacher in a local school district. Patterns that surfaced through teacher interviews were identified and used as the general basis for the study's findings. From the inside out, the responses of the participants served as the underpinning of the study's general and conclusive findings.

Results and Conclusions

Defining character. Invariably, the teachers were forthright in conceding that the idea of character is subjective in its very nature. Each referred to a core of values that represented good character in students, and four traits were identified by four or more respondents as being

attributes of good character: honesty, a strong work ethic and personal initiative, respect and tolerance for others, and an overall responsibility to one's obligations. The sentiment evoked by the Golden Rule – "do unto others as you would have them do unto you" – describes the nature of virtuous conduct that these six teachers regarded as exemplary of a student's good character.

Influencing character in the classroom. Without exception, the teachers interviewed felt that the ability to positively influence their students' character lay well within their power. Overwhelmingly, the teachers found their greatest ability to affect character in serving as models of good character themselves. As one teacher put it, "Just as important as teaching content, I believe my job is also to model behavior." In relating character education specifically to the social studies, one teacher remarked that he sought to "teach the analysis and interpretation of character, virtues, and morality through [the] study of history." To varying degrees, all six teachers asserted the value of history content in providing examples of the same ethical problems found in life; according to one, "I try to make the content relative to their own character traits." Two teachers specifically described the management of class discussions as a way of allowing all students a chance to speak, moving students past trivial ideas, and progressing in the spirit of values clarification.

All teachers cited instances in which students have overstepped the bounds of the classroom environment and expressed inappropriate comments; three of the teachers related that their students sometimes used the word "gay" as a derogatory term. In cases such as these, inappropriate comments and actions pose "a challenging point in that [the teacher has] an obligation to try to convince the student otherwise, and handle the situation professionally." All of the teachers identified these situations as "teachable moments" and suggested ways of capturing them to pursue character development. Responses varied from teacher to teacher but included playing devil's advocate, explaining why a comment offends others, and "stepping up [and] drawing a line to be a role model for right and wrong."

What teachers seek to impart. According to these six, the most important facet of the character they hope to affect lies in teaching their students how to think critically in defining their personal morals and ethics. One teacher believes that his students must understand that the right path is not always clear and not always easy to find. Given this, students need to wrestle with issues of ethics and morality. All agreed that the process of wrestling, or searching, serves to develop character in students. Inasmuch as all of these teachers spoke to the value of a student

defining his or her individual character, they also suggest that he or she should be impressed with a respect for the diversity of opinions of others. One teacher, in particular, stated, "I don't expect I can teach anyone not to be homophobic. Hopefully, I've undermined some of the causes of that lack of respect or hatred for differences."

       <u>What teachers work against</u>. Despite all of their best efforts and intentions, teachers cite elements beyond their control that they work against in trying to impart values. Of the six, three noted that time limitations become a significant factor in the development of students' character: "I think probably the biggest limitation is the limited amount of time you have with them, compared to all that they're exposed to elsewhere." Teachers also felt that they sometimes worked to counter cultural influences that are deeply ingrained in students by the time they reach high school, such as bigotry, homophobia, and sexism. As voiced by two of the six teachers, the character exemplified and imparted by the teacher in a classroom is ultimately either reinforced or destroyed when students go home. One teacher believes that, for some students, the path to virtue may be more difficult, and some may be subject to greater challenges or temptations than others: "Ethics are ethics, and character is character, but the obstacles to building that character are not the same for every individual."

Discussion and Implications

       In many respects, the results of this research study support and compliment previous findings from the existing literature. The expression of a core of character values including, but not limited to, honesty, work ethic, interpersonal respect, and responsibility parallels comparable studies aimed at defining character in terms of its contributing traits (Bulach, 2002; Wood, 1999). Similarly, teachers described their perceived role in the classroom in the same terms reported by earlier research. Ling, Burman, and Cooper (1998), in their survey of Australian teachers and education students, found that teachers viewed themselves as initiators and facilitators of classroom discussions of values and as impartial guides for students' thought processes in developing character. Like their Australian counterparts, the six participating teachers in this study sought to balance the clarification of individually-held beliefs with civic obligations to one's community and society.

       The research of Veugelers and de Kat (2003) reports that students and teachers, alike, value debates of controversial issues and agree that teachers should function in support of students' exploration of their own values. Correspondingly, the present research indicates

teachers' willingness to allow the discussion of volatile ethical issues in their classrooms, as well as their encouragement of students in wrestling with morals and values. In accord with the results of earlier surveys regarding teachers' efficacy (Milson & Mehling, 2002), the six teachers interviewed in the current study assessed themselves as good, positive role models and effective teachers of character. Surprisingly, these six were remarkably more optimistic in their confidence and reflection than their counterparts in the previous study. In one teacher's words, "I'm more optimistic now that I know my own abilities and what I can do in the classroom. It's a great thing to wake up each morning knowing that I'm going to have that opportunity."

While this study fits well within the frame of the existing literature on the subject of character education, it is not without its limitations. The size of the volunteer sample – six teachers – was limited in its scope. Given the expressed hopes and intentions of the teachers, further research might assess if and how they are made manifest in students. Also, a study of students' responses to their teachers' efforts might also prove valuable to a better understanding of character development in high school classrooms. The issues and avenues raised through this research suggest various concerns that teachers should seek to accommodate in their understanding of their position as role models and developers of character. Teachers, like their students, might find growth in the process of searching and pursuing.

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