1996

The comparison of student engagement rates during classroom discourse, cooperative learning, and lecture methods of instruction in secondary schools

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THE COMPARISON OF STUDENT ENGAGEMENT RATES DURING CLASSROOM DISCOURSE, COOPERATIVE LEARNING, AND LECTURE METHODS OF INSTRUCTION IN SECONDARY SCHOOLS

A Dissertation

Presented to

The Faculty of the School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements of the Degree

Doctor of Education

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by

Wendy Meadors Geiger

April, 1996

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Approved April 1996 by

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DEDICATION

The process of completing a doctoral dissertation requires the support and cooperation of the members of the researcher's family. I recognize that my labor to complete this research involved my entire family. I wish to thank my children, Ginny and Winfield, as well as my loving and supportive husband, Roy, for their understanding and assistance. Roy's support was invaluable as I relied on his experience both as an instructional leader and as example of preserverance in completing the requirements for this degree.

I also am grateful to my parents, Jackie and Winfield Meadors, whose on-going love and support for my personal, professional and educational growth have always inspired me. My loving sisters, Diane, Pam, and Alice, have helped encourage my efforts even though they may not have totally understood my continual search for knowledge.

It, therefore, is fitting that I dedicate this dissertation to my family.

ACKNOWLEDGEMENTS

I wish to thank the three members of my dissertation committee who helped make this research experience the most rewarding endeavor of my educational career. Dr. Thomas Ward and Dr. Ronald Wheeler provided me with excellent suggestions for this research. I am most grateful for the valuable assistance I received from my advisor, Dr. Robert J. Hanny. Dr. Hanny's professional insight and thorough understanding of the dissertation process. Dr. Hanny gave me clear guidelines and confidence needed in order that I could complete my study.

In addition, I wish to thank the teachers who agreed to participate in this study. Their professional attitude toward helping in this research project will always be appreciated.

I could not have accomplished this research without the assistance of Mrs. Leigh Quick. My gratitude for her help will be eternal.

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Abstract

The purpose of this study was to examine the degree to which cooperative learning affects the active participation or engagement of students in the classroom. Previous research has found that students were more engaged during lecture and classroom discourse methods of instruction (Anderson & Scott, 1978). This study attempted to determine whether the instructional strategy of cooperative learning affected this result.

The sample for this study was selected from the students of two English and two social studies teachers for each instructional method (cooperative learning, lecture, and classroom discourse). Videotapes were made of each teacher's class for analysis. Each class had five students whose engagement levels were studied. The participants were students at a suburban high school in southeast Virginia.

Percent of time engaged in the learning process

was estimated by dividing the number of behaviors coded as task-relevant by the total number of behaviors coded. After the rate of engagement of each instructional strategy was determined, a one-factor between-subjects design with three levels of the dependent variable, engagement of students, was used. Planned comparisons using the multiple F test were used to analyze the engagement rates for each of the three instructional strategies (lecture, classroom discourse, and cooperative learning) for each instructional area (English and social studies) and for combined subject areas to determine whether the prediction that cooperative learning had the highest engagement level was verified. Alpha was set at 0.05.

The results showed that cooperative learning techniques resulted in statistically significantly ($p < .05$) higher levels of engagement of students in the secondary classrooms studied (English and social studies) than instructional strategies using lecture or classroom discourse. In addition, there was statistically significant higher levels of engagement when cooperative learning was used in each of the subject areas English and social studies than

instructional strategies using lecture or classroom discourse.

Comparisons of engagement rates in each of the subject areas studied (English and social studies) showed no statistical difference between the instructional strategies of classroom discourse and lecture.

Further research is needed to determine the effect of cooperative learning techniques in secondary subject classes other than English and social studies, to determine the amount of time needed for cooperative learning techniques to be effective, to determine whether cooperative learning techniques ultimately result in higher achievement for secondary students, to determine if a teacher's preferred teaching method influences these results and to compare the rates of engagement for English and for social studies classes when teachers are using classroom discourse and lecture methods of instruction.

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THE COMPARISON OF STUDENT ENGAGEMENT RATES DURING CLASSROOM DISCOURSE, COOPERATIVE LEARNING, AND LECTURE METHODS OF INSTRUCTION IN SECONDARY SCHOOLS

Chapter One

The Problem

Introduction

Common sense indicates that students who pay attention learn more than students who do not pay attention. Since educators realize that it is necessary for a learner to be engaged in the learning process, they are constantly seeking methods that will increase the engagement of learners. As a result, a wide variety of instructional strategies have been developed to increase the engagement of students. Among these is cooperative learning.

Cooperative learning is a term used for a variety of organized mechanisms for students to work together for a common goal. Most teachers found early in their careers the power and the effectiveness of students helping other students. Often when a student has trouble learning a concept, even though the teacher has exhausted every way that she or he can to explain the concept, it often is easily learned when a peer

explains it in a small group setting. In addition, most teachers also have had groups that worked together well and some that did not work together at all. Cooperative learning techniques help get more groups to actually work together thus tapping into peer support for learning (Johnson & Johnson, 1987; Slavin, 1991; Kagan, 1992; Sharan, 1990b).

Although the concept of cooperative learning is as old as formal education, much of the impetus for the current movement had its origins in the early 1970s. It was then that social scientists at the Center for Social Organization of Schools at The Johns Hopkins University were called on to help Baltimore public school teachers manage newly integrated classrooms (Hotchkiss, 1990). In these integrated classrooms, teachers "found that children from diverse ethnic groups tended to resegregate themselves in the classroom, lunchroom, and social settings" (p. 168). While seeking ways to encourage students to get to know and to accept each other, the social scientists developed shared learning activities in which teams of learners studied, tutored each other, and earned team rewards. Not only did the acceptance of minority

students and the self-esteem of all the students improve, the academic achievement of all the students increased (Slavin, 1977a; Slavin, 1977b; Hollifield & Slavin, 1981; Slavin, 1987; Hotchkiss, 1990). In fact, since more and more research has shown the increase in achievement, this increase now is so expected, it is viewed as one of the principle positive outcomes of cooperative learning (Slavin, 1987; Johnson and Johnson, 1978; Goodlad, 1984; Kagen, 1992; Webb, 1982; Sharan, 1990a).

Cooperative learning has become more popular with educators. Slavin has termed the cooperative education movement a *cooperative revolution* and asserted that:

> the age of cooperation is approaching. From Alaska to California to Florida to New York, from Australia to Britain to Norway to Israel, teachers and administrators are discovering an untapped resource for accelerating students' achievement: the students themselves. There is now substantial evidence that students working together in small cooperative groups can master material presented by their teacher better than can students working on their own. (1987a, p. 7)

Research continues to be conducted on cooperative learning strategies. Several recent studies have recognized that cooperative learning activities increase the likelihood of students actively participating in learning (Greenwood, 1991, Temiyakarn & Hooper, 1993, Marchant, 1991). Greenwood reported on a study of students in grades 1-3 who were involved in a class-wide peer tutoring program where the students were paired for tutoring, then grouped to earn team points. These students spent more time engaged in academic instruction and performed better on Metropolitan Achievement Test subtests than both an at-risk control group and a non-risk comparison group of higher socio-economic students.

Temiyakarn and Hooper (1993) studied active participation in computer assisted instruction of sixth grade students randomly assigned to individual or cooperative learning groups. Temiyakarn and Hooper found the cooperative learning groups spent more time interacting with the lesson and also checked their concept learning more than those in individual learning groups. Temiyakarn and Hooper concluded that "cooperative learning mediates deeper content

processing and that achievement gains are the result of greater exploration in the learning process" (p. 8).

Marchant (1991) extended this research to older learners when he studied the effects of cooperative learning groups on the engagement of university education students enrolled in an undergraduate education psychology course. He found that behavior was more on task in the cooperative group structure with a common goal than in individual and in discussion groups. In addition, the students were more verbal in cooperative learning groups than they were in discussion groups. While this research begins to show that cooperative learning strategies can also benefit older students, more research with this age student was needed.

Background

Over the years, researchers have attempted to verify the importance of attention in the teaching/learning process. Research on academic achievement as it relates to levels of engagement has verified the obvious that students who are engaged in learning perform better on assessments. Karweit (1984) reported that the more a student spends interacting

with information or materials, the more the student is likely to learn. Hiscox, Braverman, and Evans (1982) found that students' achievement was higher when they spent more time engaged in learning activities (e.g. practicing, listening, and reading).

Researchers have found that the amount of time spent learning differs dramatically from classroom to classroom. The Beginning Teacher Evaluation Study is one of the many sources for empirical evidence relating allocated time to achievement. In this study, Fisher, et al (1978) found that one teacher could find only 68 minutes a day for instruction in reading and language arts, while another teacher was able to find 137 minutes a day. In mathematics, the same variability was shown. For example, one second grade teacher found only 16 minutes a day for instruction in mathematics, while another teacher with the same time constraints was able to find 51 minutes a day to allocate to mathematics. Such marked variability in time lends, inevitably, to differences in achievement.

When Walberg (1987) studied national statistics to improve educational productivity, he found nine factors that promote efficiency and productivity of learning.

He classified these factors in three broad categories: (1) student aptitude, including ability, development, and motivation; (2) instruction, including amount of time students engage in learning and the quality of the instructional experience; and (3) environmental factors, such as home climate, classroom social group, peer group, and television viewing.

As Walberg found, the amount of time allocated for instruction must engage students in the learning (the quality of the educational experience). This has been called "engaged time" by some educators. Several studies such as The Beginning Teacher Evaluation Study found that the actual time that students were engaged varied greatly from classroom to classroom. Fisher, et al (1978) found a variation of 2530 to 5127 minutes per year in elementary math classes. This disparity also was reflected in the achievement levels of the students.

More recently, Finn and Cox (1992) studied classroom participation and nonparticipation of fourth graders. They found that students who are participators scored higher on achievement measures as early as first grade and recommended that research

needs to be done to increase our understanding of different forms of participation in school and in the classroom. This research in participation continues to verify the importance of participation of students and to stress how important it is for teachers to look for and implement strategies that help to increase the participation of students.

Other researchers have advocated further research in the area of finding "those institutional practices that promote involvement in schooling" (Finn and Cox, 1992, p. 160). Brophy (1979) pointed out that educators should accept as well established fact that student engagement is important to student learning. Furthermore, he recommended that educators should move on to look for teaching strategies that promote student engagement.

In 1983, Wang and Walberg concluded:

> Recent developments have led to increased efforts to identify demonstrably effective practices that schools can use to increase their capabilities to maximize the allocation and use of time for learning and instruction. Nevertheless, the data base on how to optimally use school time

> to maximize student learning and the implications for instructional design is limited. Information is needed on those design features and operating conditions of instructional approaches that allow effective allocation and use of school time. (p. 603)

It is clear "instructional approaches" that increase the engagement of students is an aspect that educators continue to find important and meriting further study.

In 1978, attention of students in class was studied by Anderson and Scott when they explored the relationship between teaching methods and student involvement in learning. After observing randomly selected humanities and social studies students in grades nine through twelve, Anderson and Scott discovered that different types of teaching methods led to different levels of attention on the part of the students. In particular, they found that "the classroom discourse method had a uniformly high level of involvement across learner types, and the group work method had a uniformly low level of involvement across learner types" (p. 57).

In the years since Anderson and Scott's study,

cooperative learning has emerged as a popular and effective instructional strategy advocated by educators such as David and Roger Johnson, Robert Slavin, and Spencer Kagan. Cooperative learning is not the same as the group work studied by Anderson and Scott. The techniques of cooperative learning go beyond simply putting students into groups.

In Learning Together and Alone, Johnson stipulated the following:

> Cooperation is *not* having students sit side by side at the same table to talk with each other as they do their individual assignments. Cooperation is *not* assigning a report to a group of students where one student does all the work and the others put their names on the product as well. Cooperation is much more than being physically near other students, discussing material with other students, helping other students, or sharing material among students although each of these is important in cooperative learning. (1987, p. 12)

Johnson continued by describing four basic elements that must be included in order for small-group learning to be cooperative. These elements are positive

interdependence, face-to-face interaction, individual accountability, and appropriate use of interpersonal and small-group skills. It is these elements that set cooperative learning apart from group work.

Educators have recognized that a relationship should exist between cooperative learning and engagement of students since its development was due to educators using group participation theories. Researchers (Kagan, 1992; Slavin, 1987b; Johnson & Johnson, 1987; Smith, 1995) have continued to verify this belief.

In 1992, Kagan published a guide for teachers entitled Cooperative Learning. In this guide, Kagan gave several reasons to explain why cooperative learning has been shown in some research studies to increase student achievement. One of the reasons for increased student achievement was that cooperative learning increased time-on-task or engagement. He reported that "a consistent finding in cooperative learning research has been that students spend more time on task" (p. 313). Slavin (1987b) explained this increase in time on task to be the result of "the use cooperative reward structures (that) creates peer norms

and sanctions supporting individual efforts" (p. 1163). Since cooperative learning helps to create an environment in which a student feels as though he or she is responsible for individual and for group rewards, the student is more apt to work and therefore more apt to achieve.

Johnson, Johnson, and Smith (1995) cited over 30 studies that measured time on task as it related to cooperative learning. They found that "cooperators spent more time on task than did competitors (effect size = 0.76) or students working individualistically (effect size = 1.17)" (p. 30). These results indicate that members of cooperative learning groups seem to spend considerable more time on task than students working competitively or individualistically.

Although the studies on cooperative learning and its effects are numerous, there continues to be room for more study and for more implementation. Among the areas studied are the various reward structures and comparing cooperative learning with competitive and individualist learning. Despite many studies, much remains to be researched concerning the effects of cooperative learning, especially at the secondary

level. According to Totten, Sills, Digby, and Russ (1991) there is a "dearth of studies" (p. 3) concerning the effectiveness of cooperative learning in grades 10-12. One such area that continues to be of need of study is the effects of cooperative learning on engagement levels of students. Although cooperative learning is often cited as a method to help increase levels of participation of students (Johnson, et al, 1991; Kealy & Witmer, 1991; McFarland, 1993), whether the technique does increase engagement levels continues to be in need of study, especially at the secondary level.

Cooperative learning strategies continue to show an increase in the academic achievement of elementary students by increasing the participation of students in studies such as Greenwood (1991). Is the participation of secondary students effected in a similar fashion? Anderson and Scott's research showed group work to be the least effective for engagement of secondary students. Do the strategies in cooperative learning change this effect? The effect of cooperative learning needs further study to determine its effect on high school students. Therefore, there is value in efforts

made to replicate the work of Anderson and Scott in secondary classrooms that use cooperative learning techniques.

It is quite apparent that the effect cooperative learning has on the engagement of secondary students needed further study. Consequently, the question that this research attempted to answer was: Do cooperative learning strategies generate higher levels of engagement of students at the secondary level when compared with other instructional strategies?

Purpose of the Study

The purpose of this study was to investigate the effect of cooperative learning strategies on secondary student engagement with the lesson when compared with other instructional strategies.

Research question

Do cooperative learning strategies generate higher levels of engagement of students at the secondary level when compared with other instructional strategies?

Research Hypothesis:

> Cooperative learning techniques result in higher levels of engagement of students in a secondary classroom than instructional strategies using lecture or classroom discourse.

Design of the study

The design of this study was causal comparative in which the degree to which cooperative learning affects the active participation or engagement of high school students was studied. The hypothesis in this study was tested by comparing levels of engagement of students in classes where lecture, classroom discourse, or cooperative learning were the teacher's preferred

method of instruction.

The sample for this study was selected from the students of two English and two social studies teachers for each instructional method. Videotapes were made of each teacher's class for analysis. Each class had five students whose engagement levels were studied.

Percent of time engaged in the learning process was estimated by dividing the number of behaviors coded as task-relevant by the total number of behaviors coded. The rates of active participation for varying methods of instruction were then compared. Nonacademic activities such as taking attendance, distributing instructional materials, providing directions for the learning task, etc. were not used in the analysis. Chapter Three describes student population, procedures, instrumentation and design in detail.

Limitations

Limitations of this study include the use of the causal comparative design.

Additional limitations of this study were as follows:

1. The population studied was restricted to high school students at a suburban high school in eastern

Virginia.

2. The use of videotaping may have affected the behavior of the students. To reduce this effect, the camera was placed in the classroom two days prior to the research taping.

3. Engagement was limited to overt participation.

4. Class enrollments were predetermined by the scheduling process and selection of participants from each class was made from intact class groups.

5. Observers were limited to viewing videotapes of students. To help ensure visibility on the tapes, a wide-angle stationary camera was place in the front of the classroom.

6. Students who were observed were seated near the front of the classroom. Since this was constant for all methods being studied, the placement of students in the classroom should not affect the results.

7. Observers may change in their ability to analyze student on task behavior as they view tapes. Interrater reliability was achieved by having two trained observers who had ratings that compared by at

least 85% for the first five trials and for the last five trials.

Definition of Terms

The following terms are used in the study:

Engagement/Active participation. The involvement of a student in the learning process. This is shown by (a) the student talking with the teacher or other students about the material, (b) the student directly working on assignments, or (c) the student having "eyes on" behavior (Anderson & Scott, 1978).

Cooperative learning. Cooperative learning is a method of instruction in which learners must work together to achieve a common goal. The strategies share several general characteristics such as (a) classrooms are divided into groups of at least two members, (b) groups have an interdependent structure with high individual accountability, (c) groups have clearly defined objectives, (d) a cooperative environment and reward system are present within each group, (e) there is student support for each other's efforts to achieve, (f) there is monitoring and processing of the behavior of each group's members. (Johnson & Johnson, 1985)

Lecture method. Lecture method is "characterized by the teacher's predominantly verbal presentation of new or review material" (Anderson & Scott, 1978, p. 53).

Classroom discourse method. Classroom discourse method refers to a "series of teacher question-student response situations in which the teacher use(s) students' answers a springboards for mini-lectures on the material" (Anderson & Scott, 1978, p. 53).

Ethical Consideration

This research proposal was approved by the Committee on Human Subjects in the School of Education at The College of William and Mary was conducted in a manner that protected the anonymity of the school division and individuals who participated in the research. The research plan was developed so that there was no need to use the names of students, teachers, administrators, school or school division. To protect the confidentiality of the participants only the researcher and her assistant had access to the video tapes used in the research.

Summary

A teacher has many decisions to make as he or she

plans a lesson. One of these decisions is which instructional strategy to use. Knowledge about instructional strategies that increase the engagement of secondary students is important for educators.

Cooperative learning has emerged as an instructional strategy that could prove to be effective in increasing engagement of secondary students. This study examined the effect of cooperative learning on the engagement levels of students in a suburban high school in Virginia. This examination included comparisons of the effect of cooperative learning with the instructional strategies of lecture and classroom discourse in secondary English and social studies classes.

Chapter II

Review of Literature

This study is based in large part from questions that arose when Anderson and Scott's study of attention of students was re-examined in light of further research and development of teaching methods that effect the attention of students. In 1978, Anderson and Scott studied the attention of students in class when Anderson and Scott explored the relationship among teaching methods, student characteristics and student involvement in learning. Randomly selected humanities and social studies students in grades nine through twelve were classified into learner types based on scholastic aptitude and academic self-concept scores. After observing these students for nine days, Anderson and Scott discovered that different types of teaching methods related to different levels of attention on the part of the students. In particular, Anderson and Scott found that "the classroom discourse method had a uniformly high level of involvement across learner types, and the group work method had a uniformly low

level of involvement across learner types" (p. 57).

In the years since Anderson and Scott's study, cooperative learning has emerged as a popular and effective instructional strategy advocated by educators such as David and Roger Johnson, Robert Slavin, and Spencer Kagan who view this strategy as more than just group work. This study investigated the effect of cooperative learning when compared with the strategies of lecture and classroom discourse.

Research has shown that students need time to learn and that this time must be of a quality that enables the students to use the information in a meaningful manner (Walberg, 1987; Fredrick & Walberg, 1980; Karweit & Slavin, 1981). This chapter reviews the extensive research on the effect of participation in learning. This review includes research on student engagement during the selected instructional strategies, research on time as it relates to achievement, and research on cooperative learning as an instructional strategy to increase student engagement.

Student Engagement during Selected Strategies

The lecture and the classroom discourse methods have long been recognized as appropriate instructional

strategies. In 1963, the American Educational Research Association published Handbook of Research on Teaching. In this handbook, Wallen and Travers contributed a chapter on teaching methods as they related to the major variables and areas of research on teaching. Wallen and Travers recognized that a major limiting factor in research on the lecture and discussion methods of teaching was the lack of consistent definitions of the variables involved for these two models of teaching. Wallen and Travers found that the "evaluation of the lecture method has consisted almost entirely of comparison with the discussion method" (p. 481). The study by Anderson and Scott (1978) certainly continued this trend.

The lecture method is viewed as an appropriate method of instruction for use under given circumstances. According to Hyman (1970), this method is justified when what the student needs to know, do, or believe is external to his previous knowledge and the teacher can easily impart this new knowledge. The lecture method also is "entirely consistent with and supportive of the anthropological concept of culture ..., (that) man can communicate the knowledge he has

acquired to his offspring" (p. 131). In addition, Hyman recognized that the lecture method is efficient in terms of cost and enables students to share the same experience in a "safe", large group.

Likewise, the classroom discussion or discourse method is advocated as an instructional strategy by educators (Hyman, 1970; Gunther, Estes, & Schwab, 1990). Hyman (1970) reported that advocates of the discussion method often are guided by the point of view that

> knowledge is not transmitted by the teacher to the student. Either knowledge already lies within man, since it derives from an immortal soul (or God), or knowledge is generated by man through his own efforts, by building on what he already knows. (p. 41)

In this way, the teacher "enables" the learner to find things out for himself, allowing him to discover a way of gaining knowledge on his own.

Gunther, Estes, and Schwab (1990) recognized that discussion has "a central place in good classroom teaching" (p. 150). It is this method that allows for elaboration and discussion between teachers and

students. In addition, it is the "quality of these discussions that determines the extent and quality of the students' learning" (p. 149).

Ernest Boyer (1983) summed up this concept well when he wrote:

> There is a place in the classrooms for telling or lecturing, especially when the goal is the acquiring of organized knowledge. Teachers who can lecture well should do so. There is a place, too, for questions and answers, for structured review and drill. But there comes a time when probing questions should be asked, when the teacher should direct the student's mind from the familiar to that which is less well known but no less important. (p. 149)

Research on Time as it Relates to Achievement

Educators have always known that time is important to learning. One of the benefits of the effective schools movement has been that a common language has been developed that allows educators to "narrow the focus" (McGreal, 1983) so that educators can focus on the aspects of teaching and learning that improve achievement. From studies such as *The Beginning*

Teacher Evaluation Study (Fisher, et al., 1978) and A Nation at Risk: The Imperative for Educational Reform (1983), national attention has been brought to the idea of improving education by the increase in effective use of time. That an actively engaged student learns best is a concept that not only makes sense in a common sense way, it continues to be shown in research.

Research has documented that time allotted and time used for instruction varies across schools and classrooms within particular schools (Berliner, 1984; Fisher, et al, 1978; Karweit and Slavin, 1981). In addition, research has shown that achievement of students is effected by the amount of time that is effectively used (Berliner, 1984; Karweit and Slavin, 1981; Finn and Cox, 1992). According to Berliner (1984), "the fact that engaged time is so variable across classes is now well documented" (p. 57). Berliner also noted that the results in terms of student achievement caused by differing amounts of engaged time are documented. While the importance of time on task for all students is clearly shown, Berliner's research showed a more powerful effect with lower ability students. As a result, Berliner noted

that

> teachers need to be aware of engaged time rates - for individual students and for the class as a whole - in order to ensure that a sufficient amount of time allocated to instruction in a content area is used by students in productive ways. (p. 57)

In the early 1980s, The National Commission on Excellence in Education was created to report on the quality of education in America. In 1983, this commission published a document that was intended to capture the attention of the nation. A Nation at Risk: The Imperative for Educational Reform publicized the differences in the use of time for students in American schools. Not only was time spent in American classrooms different when compared with time spent in classrooms of other industrialized nations, time was different for students within America. For instance, this commission reported that "a California study of individual classrooms found that because of poor management of classroom time, some elementary students received only one-fifth of the instruction others received in reading comprehension" (p. 22). This

difference which had been documented in other educational research (Fisher, et al., 1978 and Karweit and Slavin, 1981) was now receiving national attention.

The commission wrote a strong statement in favor of drastic change in order for American youth to be able to compete in a global economy. One of the major recommendations concerned time. This report recommended that "*significantly more time be devoted to learning*" (p. 29). The commission recognized that this would require more effective use of the existing school day.

In 1982, Rutter, et al. published results of their study to answer the question whether schooling makes a difference in students. These researchers found in their study of secondary schools in London that not only does schooling make a difference, which school a student attends makes a difference. This research contradicted other studies such as the Coleman study that attributed only 1% of the difference to which school a student attended. Rutter, et al., found that "children were more likely to show good behavior and good scholastic attainments if they attended some schools then if they attended others" (p. 178). This

research showed that "although schools differed in the proportion of behaviorally difficult or low achieving children they admitted, these differences did *not* wholly account for the variations between schools in their pupils' later behaviour and attainment" (pp. 177-178).

Rutter, et al., found that the differences in outcome between schools were not due to "such physical factors as the size of the school, the age of the buildings or the space available; nor were they due to broad differences in administrative status or organization" (p. 178). The differences were found to be systematically related to the characteristics of schools as social institutions. Factors such as the teachers' actions in lessons were identified as being significantly associated with outcome differences between schools. In their study, Rutter, et al., noted that the hallmark of successful classroom management was keeping the pupils actively engaged rather than waiting for something to happen.

Teachers' actions that make a difference to student outcomes included teachers' expectations about the students' work and behavior, models provided by

teachers and other students, and feedback that students received on what is acceptable. This feedback could be direct (in terms of praise or reprimand in the classroom) or indirect (annual prizes or putting student's work up on the walls. Rutter, et al., found that "the most immediate and direct feedback in terms of praise or approval had the strongest association with pupil behavior" (p. 190).

Increasing, educators have recognized that time is only beneficial if this extended time is put to good use (Moore & Funkhouser, 1990; Karweit & Slavin, 1981). According to their report for the U.S. Department of Education on use of time with Chapter One programs, Moore and Funkhouser (1990) found that studies

> of time offer strong support for the value of increasing instructional time when that time is put to good use academically. This is, the time devoted to instruction is either sufficiently well structured that it engages students in learning (engaged time), or it both engages students and involves them in activities that are challenging yet provide a reasonably high rate of success (academic learning time). (p. 11)

The National School Public Relations Association published a special report in 1981 entitles Good Schools: What Makes Them Work in which the research both in educational studies and in the popular press was reviewed. There was much evidence in many studies and in newspapers concerning the importance of a task-oriented approach with time on task as a dominant characteristic. One such study came from a leading newspaper in the Baltimore area. In studying successful schools in Baltimore, M. William Salganik, an education writer for the Baltimore Sun, found that "although the principals vary in leadership style and philosophy, ... all have ideas they follow consistently, and all expect - even demand - teachers to teach and students to learn" (p. 12).

Salganik found that the primary difference between average city schools and "schools that work" was in the use of classroom time. According to logs kept over more than 64 hours of classroom time, teachers in effective schools spent an average of about two-thirds of their time actively teaching. In other schools, the average was less than half.

The National School Public Relations Association's

report summarized instruction and management as follows:

> teachers in effective schools use teaching techniques which keep students actively engaged in learning. Moreover, both classroom and building-wide management practices reflect a respect for the learning process and the learner... While the subject of effective teaching techniques deserves a report of its own, it is fairly safe to say that instructional methods used in effective schools include attention to time on task, consistent teacher cues, reinforcement, mastery learning, action learning and team learning. (pp. 24-25)

Walberg (1987) identified nine factors that increase learning. Two of these factors dealt with usage of time. He found that the amount of time students engage in learning and the quality of the instructional experience were both important factors. Walberg reported that A Nation at Risk: The Imperative for Educational Reform and other reform reports called attention to two ancient adages about learning that time matters (practice makes perfect) and that content also matters. Walberg found that time matters even

more than originally was thought. He concluded that

> since Socrates, psychological views of the learner have influenced educational theory and practice. Current psychological research provides some useful insights on time and learning.... Psychological phenomena can often best be understood by the study of extreme cases. Creativity and talent are cases in point.... Until recently, these traits have been intuitively thought of as innate or accidental. But contrary to the notion of instant creativity that was popular in the 1960s, great accomplishments are the result of opportunity and of continuous, concentrated efforts for at least a decade. (p. 27)

Walberg had found in his studies that, when asked how he managed to surpass discoveries of his predecessors, Isaac Newton replied "By always thinking about them." Friedred Gauss had said "If others would only reflect on mathematical truths as deeply and continuously as I have, they would make my discoveries." Walberg found the same need for much time for other eminent painters, writers, musicians,

etc. Walberg concluded that time does matter, especially extended time that is devoted to the task at hand.

This devotion to task is certainly important for learning. Beginning with studies such as the *Beginning Teacher Evaluation Study* (Fisher, et al., 1978), scores of studies have shown the high correlation between what is commonly called "time on task" and student achievement. The *Beginning Teacher Evaluation Study* was a six-year investigation funded by the National Institute of Education. This study found that academic learning time, the amount of time a student spends engaged in academic tasks of appropriate difficulty, is positively related to student achievement. The distinction of appropriate difficulty is important since it implies that effective teachers should plan and carry out lessons that neither frustrate students because they are too difficult nor hold students back because the lessons are too easy.

In one of the ASCD's publications on effective schools, Squires, Huitt, and Segars (1984) reported that "not surprisingly, student behavior - or what students do in class - is most directly correlated with

their achievement scores" (p. 4). In particular, the involvement or amount of time a student actively works on academic content, the amount of content covered by a student, and the success or how well a student preforms on daily assignments and unit tests have the most potential for effecting student achievement.

Since Squires, Huitt, and Segars found so much evidence of the importance of these three areas and since they are "so relatively easy to measure" (p. 5), Squires, Huitt, and Segars proposed that the focus of school improvement efforts should be in the areas of involvement, coverage, and success with quarterly evaluations in these three areas.

Engagement.

The impact that involvement has on learning has been studied independently of other variables. Research has shown that the allotted time and the engagement rate vary dramatically from classroom to classroom (Fisher, et al., 1978; McGreal, 1983; Karweit and Slavin, 1981). In addition, time research has shown that the amount of student time needed before one could expect improved student achievement varies as well as the finding that more time does not always

increase achievement. There appear to be optimal time allotments that vary from subject to subject and from age level to age level (Karweit and Slavin, 1981; Fredrick and Walberg, 1980).

Karweit and Slavin (1981) found in their studies of actual and engaged time in elementary mathematics classes that the range of scheduled time ranged from 240 to 300 minutes, actual time ranged from 176 to 308 minutes, and engaged time ranged from 100 to 244 minutes. This wide range of available learning opportunities was also echoed in the wide range of loss learning time. The range for time loss due to intrusion was from zero to 64 minutes, the time loss due to procedure ranged from four to 34 minutes, and the time loss due to inattention ranged from 18 to 51 minutes. It should not be surprising to note that the classroom with the least engaged time also had a high loss of time due to intrusion, procedure, and inattention.

Karweit and Slavin also looked at the effects of the differences in time usage. They found that both engagement rate and engaged time positively and significantly predicted the posttest score on the CTBS

in grades two and three. Karweit and Slavin found the same results in grades four and five when only items from the curriculum on the CTBS were used. In addition, they found that students need differing amounts of time to achieve the same learning goal, so inconsistencies in the effect of time spent may result. Their conclusion was that time spent was a "necessary but not sufficient condition for learning to occur" (p. 171). In addition, Fredrick and Walberg (1980) recognized that time may compensate, with diminishing returns, for poor quality instruction or less adequate home environment.

The research on active engagement has continued into the 1990s. More recently, Finn and Cox (1992) studied classroom participation and nonparticipation of fourth graders. They found that students who are participators scored higher on achievement measures as early as first grade and recommended that research needs to be done to increase our understanding of different forms of participation in school and in the classroom. In addition, Finn and Cox advocated finding "those institutional practices that promote involvement in schooling" (p. 160).

McGreal (1983) recommended in his book on teacher evaluation that educators should narrow their focus from self-developed styles that have no common goals or language to one that allows for a common focus on improvement. According to McGreal, for this focus to be accepted by teachers and administrators, it must have criteria that have a strong empirical base, a close approximation to standard practice, a "common sense" orientation, and perspectives and skills that are potentially generalizable across subject areas and grade levels. His research showed three major areas, climate, planning, and management behavior, to be some of the basic teaching tools.

The emphasis in the planning area stressed the fact that "one of the most significant outcomes of the effectiveness research has been the increased emphasis placed on time as a variable in learning" (p. 80). In McGreal's study of randomly selected middle, junior, and senior high schools in the Midwest, he found that the *average* length of a period (the time allotted for a class) was 42 minutes in the middle schools, 45 minutes in the junior high schools, and 50 minutes in the high schools. Going into randomly selected classrooms,

observers timed various activities that occurred from the beginning to the end of a period. From the opening bell until an on-task activity began averaged seven to nine minutes. The interval between the last on-task activity to the closing bell ran from six to seventeen minutes. In light of this type of information, McGreal stated that "teachers obviously need to plan for more efficient use of classroom time" (p. 83).

Bloom (1980) identified time as one of the "alterable variables" that research has shown can greatly improve student learning. He contrasted available time with time-on-task to show that while teachers and administrators could not always make significant alterations to allotted time, the active learning time (time-on-task) could be altered. Time-on-task is important since "studies of this variable show that the percentage of engaged time (for individual students or groups of students) is highly related to subsequent measures of achievement and to subsequent indices of interests or attitudes toward the learning" (p. 383).

According to Brophy (1979b) there is much evidence that teachers make a difference. He found that

> critical aspects include: (1) teachers focus on academic goals; (2) promote extensive content coverage and high levels of student involvement; (3) select instructional goals and materials and actively monitor student progress; (4) structure learning activities and include immediate, academically oriented feedback; (5) create an environment that is task oriented but relaxed. (p. 33)

These critical aspects stress the importance of students' active engagement and feedback. Brophy recognized that "effective teachers know how to organize and maintain a classroom learning environment that maximizes the time spent engaged in productive activities and minimizes the time lost during transitions, periods of confusion, or disruptions that require disciplinary action" (p. 34).

Time alone is not always the most important of learning. There needs to be a balance in the use of time. Walberg (1983) found that in studying size of effect, time spent on learning had an effect of .38. He recommended that, to improve learning, "the solution is not just more time, but also higher quality of

instruction" (p. 22). When Fredrick and Walberg (1980) studied the effect of time on learning, they concluded that "time devoted to school learning appears to be a modest predictor of achievement" (p. 193). In addition, Fredrick and Walberg found that the effect of time may appear weak and insignificant when the material is familiar, often taught, or imprecisely measured. "To the extent that additional time is used to make up partially for ineffective instruction or inability it may even be negatively correlated with achievement" (p. 193).

Despite the evidence of educational research, there continues to be a need for teachers to recognize the importance of time-on-task (Karweit, 1988; Harmin, 1994; Gunther, Estes, & Schwab, 1990). In 1988, Karweit published an article that looked at reasons why research on time-on-task has had little influence on school practice. Karweit attributed this lack of impact on two misunderstandings of the research. The first misunderstanding was that educators thought that more time automatically meant more learning when research has shown that increasing the active learning time is what is important. The second misunderstanding

was that schools did not always focus improvement efforts in areas that needed improvement. Karweit recommended that a school should assess the use of time, compare this assessment with typical ranges and then identify the areas of needed improvement.

To increase student learning, teachers and educators can make use of the recommendations of researchers. Perhaps Gunther, Estes, and Schwab (1990) best summarized the importance of time when they gave the following advice to beginning teachers:

> We know that learners will learn more in proportion to how engaged they are with what they are trying to learn. This is the *law of meaningful engagement*, though it is a law violated all too often. Not all students have the same time for learning in school.... Our experience tells us this: providing direct contact with what is to be learned and giving student frequent opportunities to explain what they know are corollaries to the law of meaningful engagement. (p. 251)

Boyer (1983) described a lively educational setting where the students are "attentive and busy" (p.

150). His "agenda for action" to improve high schools included a priority for instruction. Boyer's recommendations for improving instruction included the following:

> Teachers should use a variety of teaching styles-lecturing to transmit information, coaching to teach a skill and Socratic questioning to enlarge understanding. But there should be particular emphasis on the active participation of the student. (p. 312)

In addition, other educators (Berliner, 1984; Gunther, Estes, & Schwab, 1990) have recognized the importance of a variety of instructional strategies. Berliner (1984) wrote:

> Teachers, who must choose between recitation, lecture, discussion, reading circle, computer-mediated instruction, television, seatwork, and so on, must also learn that each activity structure limits or enhances certain factors that affect instruction. Each structure show characteristic variations in duration, number or students, opportunity for responding and whether such responding is public or private, opportunities for

> feedback to students and whether such feedback is public or private, and so on. Teachers do not, usually, know how to make these kinds of cost/benefit decisions when choosing activity structures. They must now learn to do so, since the more we learn in psychology about the operations of behavior settings, ecological settings or contexts, the more we learn how powerful they are in determining the behavior of the participants in that setting. (p. 56)

Increasing the engagement or active learning of students continues to be of interest to educators. In 1994, the Association for Supervision and Curriculum Development (ASCD) published a handbook on inspiring active learning that brought to teachers the good news that "the profession now has available practical teaching strategies that make it much easier to get today's students to buckle down to their daily work" (Harmin, p. 1). This handbook includes explanations for implementation of several strategies for increasing active learning. Harmin devotes an entire chapter to cooperative learning since it:

> has many advantages. It frees teachers' time and

> energy so they can spend more time working individually with students. And it makes for productive, active learning. Students who need explanations can often get them more quickly and personally when other student do the explaining, and students who explain ideas to others strengthen their own understanding in the process. Group work also gives students opportunities to participate in a greater variety of experiences: they have many more chances to speak, take initiative, make choices, and generally develop good lifelong learning habits. (p. 95)

Cooperative Learning

In the preface to Cooperative Learning: Theory and Research, Sharan (1990b) recognized that "we must pay considerable attention to the matter in which instruction is conducted, no less than we attend to the contents of the curriculum" (p. xiv). Sharan's premise included the recommendation that educators consider cooperative leaning methods to produce "a wide range of positive effects of the kind that schools claim they wish to generate" (p. xiv). The study of cooperative learning and its effects is important for teachers'

continued improvement and growth in teaching models.

Cooperative learning refers to a method of classroom instruction in which students are placed in small groups and work together to achieve a common goal. According to Johnson and Johnson (1978), "a *cooperative* goal structure exists when the students perceive that they can obtain their goal if and only if the other students with whom they are linked obtain their goals" (p. 3). Johnson and Johnson distinguish this goal structure from a competitive one in which students can obtain their goals only if the other students with whom they are linked fail and from an individualistic goal structure in which the goals of the students are not related. Johnson and Johnson recognized that, while all three goal structures can be used appropriately, cooperation was rarely used.

In 1983, Slavin published a research review on the effects of cooperative learning techniques on achievement. In this review, he found that techniques that use group rewards and individual accountability consistently increase student achievement while techniques that do not use group rewards had no effect. Slavin also found that task specialization increased

student achievement more than control methods when task specialization was paired with group rewards, but not when paired with individual rewards.

Slavin continued reporting on his research on cooperative learning in 1987 when he published an article in Child Development that explored developmental and motivational perspectives on cooperative learning. In this article, his purpose was "to make explicit some of the implicit assumptions underlying various cooperative learning approaches, to discuss alternative theoretical perspectives on cooperative learning, and to examine the empirical evidence to evaluate each" (p. 1162).

Slavin recognized that "the fundamental assumption of the developmental perspective on cooperative learning is that interaction among children around appropriate tasks increases their mastery of critical concepts or skills" (p. 1162). Slavin found a great deal of empirical support for the idea that peer interaction can help nonconservers become conservers. He found many studies "have shown that when conservers and nonconservers of about the same age work collaboratively on tasks requiring conservation, the

nonconservers generally develop and maintain conservation concepts" (p. 1162).

Slavin also found that many Piagetians called for increased use of cooperative activities in schools. This increase is needed since:

> interaction among students on learning tasks will lead *in itself* to improved student achievement. Students will learn from one another because in their discussions of the content, cognitive conflicts will arise, inadequate reasoning will be exposed, disequilibration will occur, and higher-quality understandings will emerge. (p. 1162)

Concerning motivational perspectives, Slavin found that "motivationalists are more concerned with the reward or goal structures under which group members operate" (p. 1162). With this perspective, the only way group members can attain their own goals is if the group is successful. This goal structure encourages each individual to assist each of his or her group members' learning.

In an early article on cooperative learning published in The Journal of Research and Development in Education in 1978, Johnson and Johnson reported on

their own and others' findings. Already there was evidence that cooperative learning experiences influenced the engagement of students in activities and their relationships with their peers and teachers. Johnson and Johnson found evidence "that the more cooperative students' attitudes, the more they can see themselves expressing their ideas and feelings in large and small classes and as listening to the teacher" (p. 7). At the same time, Johnson and Johnson found that competitive and individualistic goal structures were unrelated to indices of involvement in instructional activities. Johnson and Johnson also found evidence that "cooperative learning experiences, compared with competitive and individualistic ones, result in greater liking for talking to the class about one's ideas" (p. 7). In addition, cooperative learning experiences "promote greater willingness to present one's answers and more positive feelings toward one's answers and the instructional experience as well as more positive attitudes toward the instructional tasks and subject areas" (p. 7).

Johnson and Johnson emphasized the importance of cooperative goal structures on peer relationships.

They noted that "positive interpersonal relationships among students is necessary for both effective learning and for general classroom enjoyment of instructional activities" (p. 7-8). Johnson and Johnson found considerable evidence that cooperative experiences as compared with competitive and individualistic ones, "result in more positive interpersonal relationships characterized by mutual liking, positive attitudes toward each other, mutual concern, friendliness, attentiveness, feeling of obligation to other students, and desire to win the respect of other students" (p. 8).

In addition, Johnson and Johnson reported that evidence supported the fact that cooperative learning experiences resulted in stronger beliefs of students that they were liked and accepted by other students. "Cooperative attitudes are related to believing that one is liked by other students and wanting to listen to, help, and do schoolwork with other students" (p. 8). Beside helping students learn how to cooperate with students from other backgrounds, cooperative learning helps students with their own self esteem and self worth. Johnson and Johnson theorized that perhaps

this helps increase their willingness to engage in the instructional activities.

Slavin (1983) recognized that there were several challenges for future research on cooperative learning. Among these was the challenge to understand how cooperative incentives and tasks effect actual student behavior within cooperating groups. One educator who has attempted to further explain cooperative learning as it relates to learning has been Marzano (1992). In beginning his chapter on the use of cooperative learning with his dimensions of learning framework, Marzano noted that, although cooperative learning "is quickly becoming the most widely used instructional innovation in American education" (p. 7), not many useful distinctions have been made concerning the functions of cooperative learning beyond the clearly defined aspects that distinguish it from simply having students work in groups. Marzano then elaborated on how cooperative learning relates to his framework on learning.

In particular, Marzano recognized that cooperative groups can create a "feedback loop" for learners concerning their mental habits. In this way, learners

can develop favorable habits of mind, Marzano's fifth dimension of learning. According to Marzano, in this dimension, higher level learning occurs for a learner when his or actions are governed by habits such as being sensitive to feedback, seeking accuracy, evaluating the effectiveness of his or her actions, being precise, engaging intensely in tasks, and generating new ways of viewing situations. Cooperative learning's feedback loop can help learners adjust their learning and continue working since the work shared.

Johnson, Johnson, Roy, and Zaidman (1985) also found evidence to support this increase in feedback. Reporting on their study of the interactions of fourth grade group members in cooperative and individualist learning conditions, Johnson, Johnson, Roy, and Zaidman found that the "students in cooperative condition tended to achieve at a higher level than did the students in the individualistic condition" (p. 312). The student in the cooperative learning condition tended to perceive more peer academic support and more teacher academic support than the students in the individualistic condition. In addition, Johnson, Johnson, Roy, and Zaidman found that the students in

individualistic conditions had most of their oral interaction directed toward themselves and their teachers. This was contrary to the common assumption that students are silent when they work independently. Naturally, the students in the cooperative condition had more oral interaction between peers. In addition, "making oral statements seemed to be more related to achievement than was listening to other group members discuss the material being learned" (p. 316). Also, within the cooperative groups, only about 10% of the oral interaction was nontask related.

Berliner (1984) recommended the use of cooperative learning to enhance the interpersonal relationships between members of different social classes, races, sexes, or different ability groups. In his research on teaching, he had found that there were four "climate" factors that affect achievement in a classroom. One of these factors was a cooperative environment for learning. Berliner recognized that the "technology" for enhancing cooperation had been developed through the work of Slavin, Johnson and Johnson, Sharan, and Aronson. Key to this technology was "the requirement that every member of a group participate in activities

that can be successfully completed only through interdependent and cooperative behavior" (p. 68). He also noted that, although this technology exists, "it is not finding its way quickly into programs of teacher education" (p. 69).

That cooperative incentives work to increase the engagement of students has been recognized by advocates of cooperative learning techniques (Slavin, 1987; Slavin & Karweit, 1981; Johnson, Johnson, & Smith, 1995). Slavin (1987) speculated that

> The motivational perspective on cooperative learning would emphasize the cooperative reward structure as the critical element of cooperative learning, maintaining that if cooperative learning increases student achievement, it is because the use of cooperative reward structures creates peer norms and sanctions supporting individual efforts. p. 1163.

An analogy that springs to mind is the one concerning the chicken and the egg. Which comes first, cooperation or engagement? Does increased cooperation create an environment for engagement or does the activity of the students working together (engagement)

create cooperation? Whichever comes first, both have the potential to be increased when using cooperative learning techniques.

Cooperative learning also is effective when it is used over time. Slavin and Karweit (1981) reported that when they studied the effects of the use of cooperative learning with elementary students over a semester, "the students took their teams seriously and appeared to enjoy them throughout the treatment" (p. 33).

In addition, Slavin and Karweit found it surprising that cooperative strategies had positive effects on self-esteem when it is "such a stable personality variable" (p. 33). Slavin and Karweit attributed this positive effect to cooperative learning strategies as follows:

> it is simply possible that because students working in teams make and receive more friendships, as found in this study and others, because they are objectively more like to succeed due both to the comparison-with-equals system and to the fact of being on a learning team, and because they usually like school more, students

feel more confident in their social and academic abilities and in their lives in general. (p. 33)

The effect of cooperative learning on time on task was cited by Johnson, Johnson, and Smith (1995) in their chapter on cooperative learning and individual student achievement in Secondary Schools and Cooperative Learning: Theories, Models, and Strategies. Johnson, Johnson and Smith found "that cooperators spent more time on task than did competitors (effect size = 0.76) or students working individualistically (effect size = 1.17)" (p. 30). These results suggest that members of cooperative learning groups seem to spend considerably more time on task than students working competitively or individualistically.

Although cooperative learning may appear to be an innovation of the 1970's, the use of cooperation in learning is not a recent innovation. According to Totten (1991), "such noted educators as John Dewey and William Kilpatrick in the early part of this century and Alice Miel in the middle part of the century emphasized small group work and/or cooperative task in classrooms" (p. 2). The following excerpt from John Dewey's "pedagogic creed" originally published in 1897

displays his thoughts on cooperation in learning:

> The only true education comes through the stimulation of the child's powers by the demands of the social situations in which he finds himself. Through these demands he is stimulated to act as a member of a unity, to emerge from his original narrowness of action and feeling, and to conceive of himself from the standpoint of the welfare of the group to which he belongs. (Archambault, 1964, p. 427).

Alice Miel's work, Cooperative Procedures in Learning, was published in 1952 as a report on the findings of educators working for the Horace Mann-Lincoln Institute of School Experimentation concerning their experience with "cooperative procedures" in schools. According to Miel, the Institute staff had three assumptions: that "the school is responsible for developing an understanding of the nature of cooperative procedures and for teaching the skills involved" (p. 1), that learners should participate in deciding the purposes toward which they will work, and that knowledge is of little value unless it is related to action.

Deutsch (1977) also was an advocate for

cooperation with respect to learning. As early as 1948, Deutsch found that undergraduate students who were in cooperative groups were more effective intermember communicators, more friendly, more helpful, and less obstructive. In addition, the cooperative groups had "more coordination of effort, more division of labor, more orientation to task achievement, more orderliness in discussion, and higher productivity" (p. 26). With the efforts of these early advocates, cooperation was becoming recognized as an important concept in learning.

In 1971, Hamm of Indiana State University published an attempt to generate increase use and understanding of a concept he called "intraclass grouping" in which students in classes were flexibly grouped both homogeneously and heterogeneously for small group work. In these groups, individual potentiality was maximized through small group participation. Hamm found that student activity, involvement, and participation which are essential to the learning experience were accentuated in this structured group work. Hamm's work showed that this method of structuring group work was successful in the

Minnesota school district that he used in his research. Structuring group work was beginning to be shown to be important for more successful group work.

Furthermore, according to Slavin (1990), researchers have conducted social psychological studies into various aspects of group dynamics and cooperation since the 1920s. According to Totten (1991), a key figure in this group was Morton Deutsch, a professor at Columbia University's Teachers College, "whose primary focus for many years was theory and research on cooperation" (p. 2). David Johnson was one of Deutsch's doctoral students and, along with his brother, Richard, and others, used Deutsch's theory of cooperative and competitive situations as their "primary foundation for research on cooperative learning" (Johnson, Johnson, and Holubec, 1988, p. 1:7).

Slavin (1990) recognized that it was in the early 1970s that "research on specific applications of cooperative learning to the classroom" (p. 2) began to take place. Hotchkiss (1990) reported that, during the 1970s, social scientists at the Center for Social Organization of Schools at The Johns Hopkins University

were called on to help Baltimore public school teachers manage newly integrated classrooms. In these integrated classrooms, teachers "found that children from diverse ethnic groups tended to resegregate themselves in the classroom, lunchroom, and social settings" (p. 168). While seeking ways to encourage students to get to know and to accept each other, the social scientists developed shared learning activities in which teams of learners studied, tutored each other, and earned team rewards. Not only did the acceptance of minority students and the self-esteem of all the students improve, in addition, the academic achievement of all the students increased. The increase in achievement is now so expected, it is viewed as a principle positive outcome of cooperative learning since research has shown the increase in achievement (Hollifield & Slavin, 1981; Slavin, 1977a; Slavin, 1977b; Slavin, 1987; Hotchkiss, 1990).

Since the 1970s, there has been much effort to develop, field test and research "a multitude of new cooperative learning strategies" (Totten, 1990, p. 2). Slavin stated that "cooperative learning is one of the most thoroughly researched of all instructional

strategies" (1989/90, p. 52).

However, Totten's review of cooperative learning research published in 1990 found that there was a need for further research and study of cooperative learning. He stated:

> While real progress has been made in the area of establishing a solid empirical base, numerous areas and concerns still need to be studied in much more depth. A classic example concerns the effectiveness of cooperative leaning in grades 10-12. While ample research concludes that cooperative learning is effective in grades 2-9, there is a dearth of studies in regard to grades 10-12. (p. 3)

Some of the controversy surrounding cooperative learning has centered around its appropriateness across curriculum areas. Commenting on key research findings, Joyce, Showers, and Rolheiser-Bennet (1987) reported that:

> Research on cooperative learning is overwhelmingly positive, and the cooperative approaches are appropriate for all curriculum areas.

> The more complex the outcomes (higher-order processing of information, problem solving, social skills and attitudes), the greater are the effects. The cooperative environments engendered by these models have substantial effects on the cooperative behavior of the students, increasing feeling of empathy for others, reducing intergroup tensions and aggressive and antisocial behavior, improving moral judgment, and building positive feelings toward others, including those of other ethnic groups . . .. We should not expect that the implementation of cooperative learning strategies on a wide scale would be as thorough as the intensive treatments reported in research literature, but solid effects should occur in schools where adequate and well-designed staff development is provided. (p. 17)

Despite cooperative learning's growing popularity, the method continues to have a long way to go before it becomes a common practice in our schools. Goodlad (1984) recognized this in his highly acclaimed A Place Called School when he wrote:

> No matter how we approach the classroom in an

effort to describe and understand what goes on, the teacher comes through as a coach, quarterback, referee, and even rule-maker. But there the analogy must stop because there is no team. There is, instead, a loosely knit group. Each student/player plays the same position, with varying degrees of skill. There is no inherent opportunity or reason to admire performances in other positions and how each contributes to effective team accomplishment. There is little or nothing about a classroom as it's conducted, so far as I am able to determine, that suggests the existence of or need for norms of group cohesion and cooperation for achievement of a shared purpose.

The most successful classrooms may be those in which teachers succeed in creating commonly shared goals and individuals cooperate in ensuring each persons success in achieving them. The ultimate criterion becomes group accomplishment of individual progress. But this would be countervailing to prevailing practice, at least as revealed by our data. (p. 108)

In the years since Goodlad published this book, educators (Digby, 1995; Sharan, 1995) have recognized that cooperative learning techniques are appropriate methods for helping to develop a "shared purpose" for learning. Cooperative learning research should help educators recognize its continued usefulness as an instructional technique to help engage the learners. Once the learners become "a team," they may work harder and accomplish more.

Several researchers (Widaman & Kagan, 1987; Okebukola, 1985; Webb, 1982) have recognized that cooperative learning strategies may have mixed results with students. Widaman and Kagan (1987) studied the effect of cooperative learning structures on cooperative and competitive students. In their study, they sought to find any differences among differing class structures on students that could be attributed to the students' cooperative or competitive natures. They found their cooperative learning class that used the Teams-Games-Tournament structure in which the students competed weekly in face-to-face competition to gain points for their team achieved the best results for the competitive students. The cooperative students

fared better in the classes in which students gained points for their teams based on individual performance on weekly quizzes. Their conclusion was that there is "no single classroom structure that is best for all students - the attributes of individual students must be considered when advocating optimal classroom structure" (p. 364).

This conclusion was also reached by Okebukola (1985) who studied the effectiveness of cooperative and competitive interaction of students in science classes. His research studied the achievement of eighth grade Nigerian science students who received instruction in "purely cooperative" (the Johnson and Johnson model and JIGSAW), a mixture of cooperative and competitive (the TGT and STAD models), or purely competitive (students competed against group members for first, second, and third place). Okebukola found that the purely cooperative techniques were better than the purely competitive techniques. However, in addition, he found that the mixture of the cooperative and the competitive techniques to be even better. He concluded that "an instructional technique that attempts to vary methods for facilitating learning may well best facilitate the

flow of events in the classroom learning environment" (p. 507-508).

Webb (1982) reviewed research bearing on small groups learning and concluded that an individual's role in group interaction is an important influence on learning. She found that receiving *terminal* feedback (only receiving the correct answer) was negatively related to achievement while receiving *process* feedback (receiving an explanation on how to obtain the correct answer) was positively related to achievement. Based on her study, Webb concluded that both giving and receiving help are beneficial for achievement.

Webb also found that off-task and passive behavior in groups are negatively related to achievement. "Merely observing other students' work activities and listening to others explanations was not sufficient to learn the material" (p. 427). Again, just placing students in groups would not improve achievement. Of all the predictors that she examined, "student ability and reward structure had the most consistent relations with student interaction" (p. 438). Rewarding students for the achievement of all group members consistently promoted helping behavior. Instructing students to

work with others was not always effective unless this work was accompanied by group rewards. She recommended continued research in the area of group interaction and achievement.

Educators have as one of their concerns the effects of cooperative learning on special needs students. The results have shown the techniques to be beneficial for these students. A study with learning disabled and nondisabled students in grades two through eight was conducted by Cosden, Pearl, and Bryan. These researchers found that "there were significant effects of condition on several study behaviors" (1985, p. 109). These effects showed that boys who were given cooperative instructions "asked more questions, answered more questions, and engaged in more helping and elaborating" (p. 109) than boys who received individual study instructions. This same effect was evidenced by the girls in the study. There was a difference between the results of the boys and the girls when nondisabled students were paired with learning disabled students. While the nondisabled girls worked with the disabled girls, the nondisabled boys did not show the same results. Cosden, Pearl, and

Bryan gave as possible explanations for this difference in results the fact that the boys in the study had long standing antagonisms while, although nondisabled girls had been usually intolerant of disabled girls, the cooperative structure may be helpful in helping the disabled girls experience positive social interactions with nondisabled girls.

Other researchers have studied the effects of cooperative learning with students with disabilities. Madden and Slavin (1983) studied the effects of cooperative learning techniques on elementary students with mild academic handicaps and their normal-progress peers. Madden and Slavin found that there was a significant decrease in rejection coupled with greater academic achievement and enhanced self-concept for both groups of students. While friendships did not result in the use of cooperative learning techniques, "the improvement in the social acceptance of handicapped children reflected in the decrease in rejection is to suggest that Cooperative Learning be accepted as an option for improving relations between these groups" (p. 180).

Ralph Maltese, an experienced English teacher who

has developed cooperative units in his English class, expressed his understanding of why a collaborative structure is often successful since "it incorporates three essential features of the learning experience" (1991, p. 20). These features are spaces of appearance (opportunities for the student to perform), active engagement (doing), and ownership (knowledge that the student can embrace as his or her own). Maltese recognized that:

> one of my teaching responsibilities is to construct activities that enable students to become involved with the subject matter in such a way that new insights, new combinations of ideas, are developed and that these insights and concepts, by their association with the component of doing, are placed into long-term, rather than short-term memory. (p. 22)

Knight and Bohlmeyer (1990) reported on their study of the research "on the hypothesized causal mechanisms through which cooperative learning environments may influence academic achievement" (p. 1) and found that although a "number of researchers have suggested that cooperative learning increases student

involvement" (p. 9), it is difficult to show a causal relationship due to the uncertainty of classroom situations and the complexity of examining specific potential mechanisms in cooperative learning environments. They also concluded that, although much research by Slavin and Johnson and Johnson has shown that cooperative learning enhances academic achievement, this research has most frequently addressed the effects of cooperative learning indirectly. Knight and Bohlmeyer felt more knowledge of how cooperative learning methods influence academic achievement was important to research. In the research in this area they found several studies that suggested that cooperative learning techniques increase student involvement and interest in learning. Knight and Bohlmeyer stated that they found little research that addressed involvement directly and that "it is unlikely that comparing cooperative learning methods will convincingly identify the causal mechanisms" (p. 9).

Johnson and Johnson (1985) found that while more learning time results in more learning, there was little difference in time on task in cooperative, competitive, and individualistic goal structures.

Johnson and Johnson recognized that increased time may account for only a small portion of increased achievement over other types of goal structures.

There continues to be the need for further research in discovering more about cooperative learning and why it helps students learn. Kagan (1992) wrote in his guide on cooperative learning that "in all honesty, we do not know very much about why the use of small cooperative teams in the classroom produces such generally and large positive academic and social gains" (p. 3:2). He speculated that from his study, the tutoring and practice fostered by cooperative teams increase the quantity and the quality of tutoring and practice. In particular, Kagan found that "a consistent finding in cooperative learning research has been that students spend more time-on-task" (p. 3:3).

Kagan found that this increase in time-on-task was due to the:

> game-like nature of the learning tasks, the clarity of task structures, the subdivision of the task into easily mastered parts, and most importantly, the interactive nature of the task. Students like to talk. The desire to express

> oneself to a peer, a constant problem in the traditional classroom, is channeled in the cooperative classroom toward academic achievement. So, rather than taking time away from task in cooperative formats, peer interaction directs students toward the academic task. This is especially true because of the incentive reward structure; peers are motivated to keep their teammates on task because that behavior will result in higher rewards for their team. (pp. 3:3-4)

Sharan (1990a) also found that the high degree of students' engagement in the task was a factor that contributes to the appeal of cooperative learning. Sharan found that "this active involvement in learning is almost always accompanied by a distinct decline in students' disruptive behavior" (p. 287). In fact, "the more personal, intimate, and supportive relationship established by teachers ... with their students in the cooperative classroom, along with the interest generated by direct interaction with peers, appears to dispel a good deal of ... boredom and the students' disruptive behavior" (p. 287).

In advocating cooperative learning for secondary students, Johnson, Johnson, and Smith (1995) wrote that the paradigm that teaching is "to transfer the teacher's knowledge to a passive student so that teachers can classify and sort students in a norm-referenced, competitive way" (p. 8) has changed. The new paradigm for teaching includes six principles. The first principal is that knowledge is constructed, discovered, transformed, and extended by students. Second, students actively construct their own knowledge. Third, teacher effort is aimed at developing students' competencies and talents. Fourth, education is a personal transaction among students between the teachers and students as they work together. Fifth, all of the above can only take place within a cooperative context. Sixth, teaching is assumed to be a complex application of theory and research that requires considerable teacher training and continuous refinement of skills and procedures. (pp. 9-10) Johnson, Johnson, and Smith concluded that the new paradigm could be primarily achieved by the use of cooperative learning. They found that "carefully structured cooperative learning ensures that students

are cognitively, physically, emotionally, and psychologically actively involved in constructing their own knowledge and is an important step in changing the passive and impersonal character of many classrooms" (p. 10).

It is obvious that, although there has been much research on cooperative learning, there was still a need for more research in order to learn more about this instructional strategy.

Chapter III

Procedures

This study examined the degree to which cooperative learning affects the active participation or engagement of students in the classroom.

Research Question

The question that this research attempted to answer was:

> do cooperative learning strategies generate higher levels of engagement of students at the secondary level when compared with other instructional strategies (lecture and classroom discourse)?

The hypothesis for this study was:

> Cooperative learning techniques result in higher levels of engagement of students in a secondary classroom than instructional strategies using lecture or classroom discourse.

Design

There was one independent variable present: the type of teaching method. The type of teaching method refers to a characteristic way of conducting classroom

interaction. The methods of instruction being studied were lecture, classroom discourse, and cooperative learning. The teachers participating in this study had one preferred method of instruction. Videotapes of each participating teacher's classes were analyzed for the engagement rates of students during the teacher's preferred method of instruction. The rates of engagement for each instructional strategy were then compared using the multiple F test with an alpha of 0.05.

The study may be described as having a causal comparative research design. Borg and Gall (1989) stated that this method is used "instead of the experimental method because many of the cause-and-effect relationships in education ... do not easily permit experimental manipulation" (p. 537). The results should enable educators to better understand the effects of lecture, classroom discourse, and cooperative learning methods on engagement rates of high school students.

Sample

One of the goals of educational research is the generalizability of the findings. This study sought to

determine the effect of using cooperative learning strategies on high school students throughout the nation. Students from a selected high school in Virginia were used in this study to be representative of this target population. In order to maximize the generalizability of the study, the participation of two different disciplines (English and social studies) was used.

The participants were students at a suburban high school in grades nine through twelve. The data were collected during the spring semester. A letter of transmittal was distributed to the Assistant Superintendent for Instruction of the school division selected for the study. The letter provided a brief overview of the study, its significance, and an assurance of that the anonymity of the school division and personnel will be protected. The school division was offered a copy of the study's findings. This researcher followed the specifications of the school division's policy on research in its classrooms. Also, this study was approved by the College of William and Mary School of Education's Human Subjects Research Committee.

Instrumentation

This research was conducted by video taping classes for three days over a two week period of time. Video taping is an established method of obtaining data that enables the observers to "no longer need to make ratings at the time particular events are occurring" (Borg & Gall, 1989, p. 486). In addition, Borg and Gall noted that the tapes could be replayed several times for careful study and that using video tapes make it easier to test the reliability with which observers can use categories for ratings.

The engagement levels of five students from each tape was determined using a method similar to Marchant's StRoBe system. Marchant (1989) reported that, using this method, the observer could analyze a learner's behavior and decide whether the behavior was on task in four to fifteen seconds, with an average of ten seconds, before moving on to the next student. Students were rated in clockwise order beginning with the left most student and continuing for the entire instructional period in 15 minute intervals with a five minute rest period between rating intervals. A chart system similar to Marchant's StRoBe system was kept.

The chart had space for each student for coding the instructional method and whether or not the student was engaged. The chart used for record keeping had space for the researcher to code the instructional method and whether or not each student was engaged. A sample of the chart is in the appendix.

Percent of time engaged in the learning process was estimated by dividing the number of behaviors coded as task-relevant by the total number of behaviors coded.

Procedure

Video tapes were made of classrooms of English and social studies teachers who reported to the researcher that they prefered lecture, classroom discourse, or cooperative learning as an instructional method. There were two English and two social studies teachers for each instructional method. Each teacher had three 90 minute class periods videotaped. Each class had 5 students whose engagement levels studied.

Two days before the study, a video camera was placed in the classrooms to be studied. The purpose of this was to get the students used to the video camera prior to the study. After this initial period, each

class in the study was video-taped for at least three class periods within a two week period of time. The teacher furnished the researcher a written lesson plan for the two weeks to ensure a sampling of the strategies being studied.

From each teacher, the tapes were analyzed for a total of 60 minutes to determine the level of engagement of his or her students during the teacher's preferred instructional activity. There were five students studied from each class. Students were selected whose engagement levels could be observed on the video tape.

Analysis

The analysis consisted of rating the engagement of each of the selected students, moving from student to student on an average of every 10 seconds. Percent of time engaged in the learning process was estimated by dividing the number of behaviors coded as task-relevant by the total number of behaviors coded. The rates of active participation for varying methods of instruction were then compared. Nonacademic activities such as taking attendance, distributing instructional materials, providing directions for the learning task,

etc. were not used in the analysis.

Interrater reliability was achieved by having two trained observers who had ratings that compared by at least 85% for the first five trials and for the last five trials. The first five trials were immediately after the training session and before the tapes were analyzed. The last five trials were held after the tapes were analyzed.

After the rate of engagement of each instructional strategy was determined, a one-factor between-subjects design with three levels of the independent variable, engagement of students, was used. Planned comparisions using the multiple F test were used to analyze the engagement rates for each of the three instructional strategies (lecture, classroom discourse, and cooperative learning) for each instructional area (English and social studies) and for combined subject areas to determine whether the prediction that cooperative learning had the highest engagement level was verified. Alpha was set at 0.05.

Chapter IV

Results

Introduction

The purpose of this study was to examine the degree to which cooperative learning affects the active participation or engagement of students in the classroom. Previous research has found that students were more engaged during lecture and classroom discourse methods of instruction than during group work (Anderson & Scott, 1978). This study attempted to determine whether the instructional strategy of cooperative learning affected this result.

Sample

The sample for this study was selected from the students of two English and two social studies teachers for each instructional method. Videotapes were made of each teacher's class for analysis. Each class had five students whose engagement levels were studied.

Percent of time engaged in the learning process was estimated by dividing the number of behaviors coded as task-relevant by the total number of behaviors coded. The engagement rates of students in each of the

English and social studies classes that were studied are included in Table 1.

Table 1

CLASS ENGAGEMENT RATES

Instructional Strategy	Subject Matter		Engagement Rates
Cooperative Learning	English	Class 1	0.852174
Cooperative Learning	English	Class 2	0.975309
Cooperative Learning	Social Studies	Class 1	0.978903
Cooperative Learning	Social Studies	Class 2	0.993367
Lecture	English	Class 1	0.536278
Lecture	English	Class 2	0.787554
Lecture	Social Studies	Class 1	0.257534
Lecture	Social Studies	Class 2	0.564263
Classroom Discourse	English	Class 1	0.729798
Classroom Discourse	English	Class 2	0.763855
Classroom Discourse	Social Studies	Class 1	0.538318
Classroom Discourse	Social Studies	Class 2	0.703106

(n = 5 for each class)

Analysis of Data for the Hypothesis

The purpose of this study was to answer the question:

do cooperative learning strategies generate higher levels of engagement of students at the secondary level when compared with other instructional strategies (lecture and classroom discourse)?

The engagement rate for each of the instructional strategies for the combined English and social studies classes are presented in Table 2. In addition, Table 2 contains the standard deviation values derived for engagement rates of each instructional strategy.

Table 2

ENGAGEMENT RATES FOR INSTRUCTIONAL STRATEGIES

Instructional Strategy	Rate	Standard Deviation
Cooperative Learning	.93	.13
Lecture	.54	.23
Classroom Discourse	.67	.20

(n = 20 for each instructional strategy)

In order to determine whether there is a significant difference in the rates of engagement for each instructional strategy, an analysis of variance test was performed. A one-factor among-subjects analysis of variance resulted in a statistically significant difference among the means of the three instructional strategies: $F_{obs}(2,57) = 21.470$, $MS_{error} = .037$, $p < .05$. The results of this test are displayed in Table 3.

Table 3

ANALYSIS OF VARIANCE

Source of Variation	Sum of Squares	df	Mean Square	F	p
Instructional	1.605	2	.803	21.470	.00
Explained	1.605	2	.803	21.470	.00
Residual	2.131	57	.037		
Total	3.736	59	.063		

(n = 60)

A further analysis was then conducted using a pairwise a priori comparison among the three means.

The engagement rates of cooperative learning and lecture (difference = .37), cooperative learning and classroom discourse (difference = .26), and lecture and classroom discourse (difference = -0.13) were compared. These comparisons were all statistically significant (critical difference = .108) and are shown in Table 4.

Table 4

PAIRWISE DIFFERENCES OF MEANS

Type of Instruction	Lecture	Classroom Discourse
Cooperative Learning	.37*	.26*
Lecture		-0.13*

* $p < .05$, multiple F test, CD = .108

Analysis of Each Subject Areas's Rate of Engagement

Further tests were made to explore the differences among the instructional strategies for each subject area. The rates of engagement for each instructional strategy for English classes and for social studies classes were calculated. In order to determine whether

there is a significant difference in the rates of engagement for each instructional strategy for each subject area, an analysis of variance test was performed.

English. Table 5 presents the engagement rates for English classes for each instructional strategy.

Table 5

FREQUENCY RATES FOR INSTRUCTIONAL STRATEGIES FOR ENGLISH CLASSES

ENGLISH	Rate	Standard Deviation
Cooperative Learning	.90	.18
Lecture	.63	.19
Classroom Discourse	.73	.19

(n = 10 for each instructional strategy)

In order to determine whether there is a significant difference in the rates of engagement for each subject matter with regards to each instructional strategy, an analysis of variance test was performed. A one-factor among-subjects analysis of variance

resulted in a statistically significant difference among the means of the three instructional strategies: $F_{obs}(2,57) = 5.690$, $MS_{error} = .034$, $p = .009$. The results of this test are displayed in Table 6.

Table 6

ANALYSIS OF VARIANCE

ENGLISH CLASSES

Source of Variation	Sum of Squares	df	Mean Square	F	p
Instructional	.387	2	.194	5.690	.009
Explained	.387	1	.194	5.690	.009
Residual	.918	27	.034		
Total	1.305	29	.045		

(n = 30)

A further analysis was then conducted using a pairwise a priori comparison among the three means. The engagement rates of cooperative learning and lecture (difference = .27), cooperative learning and classroom discourse (difference = .17), and lecture and classroom discourse (difference = -0.10) were compared.

The comparisons between the rates for cooperative learning and lecture and between the rates for cooperative learning and classroom discourse were statistically significant (critical difference = .15). The comparisons between the rates for lecture and classroom discourse were not statistically significant. These comparisons are shown in Table 7.

Table 7

PAIRWISE DIFFERENCES OF MEANS

ENGLISH CLASSES

Type of Instruction	Lecture	Classroom Discourse
Cooperative Learning	.27*	.17*
Lecture		-0.10

* $p < .05$, multiple F test, CD = .15

(n = 30)

Social studies. Table 8 presents the engagement rates for social studies classes for each instructional strategy.

Table 8

FREQUENCY RATES FOR INSTRUCTIONAL STRATEGIES

SOCIAL STUDIES CLASSES

SOCIAL STUDIES	Rate	Standard Deviation
Cooperative Learning	.96	.06
Lecture	.45	.25
Classroom Discourse	.60	.19

(n = 10 for each instructional strategy)

In order to determine whether there is a significant difference in the rates of engagement for each subject matter with regards to each instructional strategy, an analysis of variance test was performed. A one-factor among-subjects analysis of variance resulted in a statistically significant difference among the means of the three instructional strategies: $F_{obs}(2,57) = 19.351$, $MS_{error} = .035$, $p < .05$. The results of this test are displayed in Table 9.

Table 9

ANALYSIS OF VARIANCE

SOCIAL STUDIES CLASSES

Source of Variation	Sum of Squares	df	Mean Square	F	p
Instructional	1.373	2	.687	19.351	.000
Explained	1.373	1	.687	19.351	.000
Residual	.958	27	.035		
Total	2.332	29	.080		

(n = 30)

A further analysis was then conducted using a pairwise a priori comparison among the three means. The engagement rates of cooperative learning and lecture (difference = .51), cooperative learning and classroom discourse (difference = .36), and lecture and classroom discourse (difference = -0.15) were compared.

The comparisons between the rates for cooperative learning and lecture and between the rates for cooperative learning and classroom discourse were statistically significant (critical difference = .15).

The comparisons between the rates for lecture and classroom discourse were not statistically significant. These comparisons are shown in Table 10.

Table 10

PAIRWISE DIFFERENCES OF MEANS

SOCIAL STUDIES CLASSES

Type of Instruction	Lecture	Classroom Discourse
Cooperative Learning	.51*	.36*
Lecture		-0.15

* $p < .05$, multiple F test, CD = .15

(n = 30)

Chapter V

Summary, Conclusions, Recommendations, and Implications

Summary of the Study

During the past several decades, researchers have found evidence that various instructional strategies have differing effects on student engagement (Anderson & Scott, 1978). In addition, much evidence has been found that an engaged student learns more than a student who is not engaged in the learning (Hiscox, Braverman & Evans, 1982; Karweit, 1984; Walberg, 1985). In the years since Anderson and Scott found that group work had uniformly low levels of involvement, cooperative learning strategies have emerged as popular and effective methods for increasing student involvement (Greenwood, 1991; Temiyakarn & Hooper, 1993; Marchant, 1991; Johnson, Johnson, & Smith, 1995). However, research on cooperative learning continues to be needed, especially at the high school level (Totten, Sills, Digby, & Ross, 1991). This study built upon the research by Anderson and Scott by comparing the effects of cooperative learning with other instructional

strategies (lecture and classroom discourse).

The purpose of this study was achieved by analyzing videotapes of two secondary English and social studies classes for each instructional strategy. Each class had five students whose engagement levels were used for comparisons. Percent of time engaged in the learning process was estimated by dividing the number of behaviors coded as task-relevant by the total number of behaviors coded.

After the rate of engagement of each instructional strategy was determined, a one-factor between-subjects design with three levels of the independent variable, engagement of students, was used. Planned comparisons using the multiple F test were used to analyze the engagement rates for each of the instructional strategies (lecture, classroom discourse, and cooperative learning) for each instructional area (English and social studies) and for combined subject areas.

Limitations

The conclusions, discussion, interpretations, and recommendations rising from this study need to be considered in light of the use of the causal

comparative design and of the following limitations cited in Chapter I:

1. The population studied was restricted to high school students at a suburban high school in eastern Virginia.

2. The use of videotaping may have affected the behavior of the students. To reduce this effect, the camera was placed in the classroom two days prior to the research taping.

3. Engagement was limited to overt participation.

4. Class enrollments were predetermined by the scheduling process and selection of participants from each class was made from intact class groups.

5. Observers were limited to viewing videotapes of students. To help ensure visibility on the tapes, a wide-angle stationary camera was place in the front of the classroom.

6. Students who were observed were seated near the front of the classroom. Since this was constant for all methods being studied, the placement of students in the classroom should not affect the results.

7. Observers may change in their ability to analyze student on task behavior as they view tapes. Interrater reliability was achieved by having two trained observers who had ratings that compared by at least 85% for the first five trials and for the last five trials.

In addition, the following limitations must be recognized:

1. The sample size for each of the subject areas was small. This could effect the generalizability of the results.

2. The teachers who preferred cooperative learning may be teachers who would be knowledgeable about student involvement and have similar results with any instructional strategy. It must be recognized that perhaps the teachers who are better with engaging their students have seen the power of cooperative learning techniques and therefor use these techniques. These teachers may view teaching techniques as a "means to an end, not as an end in and of itself" (Prawat, 1989, p. 30). Prawat found teachers who shared a sense of what the strategy was all about with their students contributed to "students' abiltiy to make effective use

of the strategy" (p. 30).

3. The possibility exists that the design allowed social behavior to be recorded as engagement in cooperative learning. During the other two strategies, social behavior may not have been counted as engaged.

4. This study examined only one dependent measure and only one kind of engagement.

5. This study did not examine achievment, student products, motivation, or other possible dependent measures. This study provides a "piece" in the mosaic that allows one to examine the effectiveness of certain teaching styles.

Conclusions

In light of these limitations, the conclusions drawn from this study were as follows:

1. The hypothesis is accepted. Cooperative learning techniques resulted in statistically significantly ($p < .05$) higher levels of engagement of students in the secondary classrooms studied (English and social studies) than instructional strategies using lecture or classroom discourse.

2. Cooperative learning techniques resulted in statistically significantly ($p < .05$) higher levels of

engagement of students in the secondary English classrooms studied than instructional strategies using lecture or classroom discourse.

3. Cooperative learning techniques resulted in statistically significantly ($p < .05$) higher levels of engagement of students in the secondary social studies classrooms studied than instructional strategies using lecture or classroom discourse.

4. Comparisons of engagement rates in the secondary English classrooms studied showed no statistical difference between the instructional strategies of classroom discourse and lecture.

5. Comparisons of engagement rates in the secondary social studies classrooms studied showed no statistical difference between the instructional strategies of classroom discourse and lecture.

Discussion

Cooperative learning techniques have been shown to be effective for facilitating students' working together on group goals (Johnson & Johnson, Slavin, Kagan). This study re-examined the research of Anderson and Scott (1978) and demonstrated that cooperative learning techniques change Anderson and

Scott's findings. Cooperative learning techniques had the greatest levels of engagement for each subject area studied and for the combined subject areas ($p < .05$). These results are quite different from Anderson and Scott's in which group work was found to have the lowest levels of engagement of the instructional strategies studied for all learner types. As in previous studies, the present study found that cooperative learning techniques are effective for increasing engagement of students.

As Anderson and Scott found in 1978, for the combined classes, the classroom discourse method had significantly higher levels of engagement than the lecture method. However, when English and social studies classes were studied separately, there was no statistically significant difference between the engagement rates of the classroom discourse and the lecture methods. Since the sample size for each of these comparisons was small ($n = 10$), there needed to be a large difference ($CD = .15$) to be statistically significant. Given these circumstances, that cooperative learning had higher rates than either of the other two instructional strategies demonstrates the

effectiveness of cooperative learning for each of these subject areas.

Recommendations

Further research in the areas of engagement and of cooperative learning is needed.

1. The effect of cooperative learning techniques in secondary subject classes other than English and social studies needs to be studied. An instructional strategy may not be effective for every subject area.

2. There is a need for further research concerning the amount of time needed for cooperative learning techniques to be effective. Since this study was limited to the late spring, further study needs to be conducted at other times of the school year to determine whether the same results would occur.

3. Further research is needed to determine whether cooperative learning techniques ultimately result in higher achievement for secondary students.

4. Further research is needed to compare the rates of engagement for English and for social studies classes when teachers are using classroom discourse and lecture methods of instruction.

5. Further research is needed to determined the

effect of having a teacher teach in areas other than his or her preferred strategy.

6. Further research is needed to determine whether the goal structure (i.e. what students are working on) has an effect regardless of the teaching strategy..

Implications

Teachers have many decisions to make while planning their lessons. The results of this study suggest that teachers should strongly consider incorporating cooperative learning techniques into their classroom instruction as a means of increasing the engagement of their students. As found in the review of literature in Chapter II, increasingly, educators have recognized that time is only beneficial if it is put to good use (Moore & Funkhouser, 1990); Karweit & Slavin, 1981). Bloom (1980) identified time as one of the "alterable variables" that research has shown can greatly improve student learning. He contrasted available time with time-on-task to show that while teachers and administrators could not always make significant alterations to allotted time, the active learning time (time-on-task) could be altered.

Time-on-task is important since "studies of this variable show that the percentage of engaged time (for individual students or groups of students) is highly related to subsequent measures of achievement and to subsequent indices of interests or attitudes toward the learning" (p. 383).

This study has demonstrated that cooperative learning is effective for increasing the engagement of high school students in English and social studies classes. Teachers need to be cognizant of the positive effects of cooperative learning structures. The study of cooperative learning and its effects is important for teachers' continued improvement and growth in teaching.

According to Johnson and Johnson (1978), "a *cooperative* goal structure exists when the students perceive that they can obtain their goal if and only if the other students with whom they are linked obtain their goals" (p. 3). Johnson and Johnson distinguish this goal structure from a competitive one in which students can obtain their goals only if the other students with whom they are linked fail and from an individualistic goal structure in which the goals of

the students are not related. Johnson and Johnson recognized that, while all three goal structures can be used appropriately, cooperation was rarely used.

The results of this study show that cooperative learning techniques engage students more than the instructional strategies of lecture and classroom discourse. However, these results do not imply that cooperative learning techniques are the only techniques that a teacher should use or that learning took place during this study. These results demonstrate that classroom discourse and lecture methods each engage students, but not to the levels found in the classes that used cooperative learning.

The lecture method is justified when what a student needs to know, do or believe is external to his previous knowledge and the teacher can easily impart this new knowledge (Hyman, 1970). Experts suggest that there are things teachers can do to raise engagement levels. According to Gunter, Estes, and Schwab (1990), the following steps should be conducted when using a direct instruction method such as the lecture method:

1. *Review previously learned material:* Make certain that students have mastered the material

taught previously and that they understand the connections to the new learning.

2. *State the objectives of the lesson:* The objectives should be presented to the students at the beginning of the lesson in language they can comprehend.

3. *Present new material:* New material should be well organized and presented in an interesting manner. Frequent checks should be used to determine if the students are comprehending the information.

4. *Conduct guided practice:* The teacher guides the students through practice sessions, making certain that they are performing correctly.

5. *Assign independent practice:* The teacher continues to supervise the students as they work independently, checking for error. Homework should be assigned for independent practice only when the teacher feels certain that the students can practice correctly.

6. *Periodic review with corrective feedback:* Homework is checked before new instruction is given, and reteaching is conducted if necessary.

> The teacher conducts periodic checks to make certain that the new learning has been retained. (pp. 82-83)

In addition, a teacher can increase the engagement of students while using the lecture method by incorporating effective questioning techniques. Berliner (1984) recommended that, based on research, a teacher should ask more higher level questions and "should wait longer than they usually do between asking a question and requesting a response" (p. 65). Kerman (1979) reported on the results of TESA (Teacher Expectations and Student Achievement) in which there are three strands to give equal opportunity to students during questioning or response opportunities. The strands included increasing response opportunity through equitable distribution, individual help, latency, delving and higher level questioning. In addition, feedback (affirming the correctness of responses, correction of errors, praise, reasons given for praise, listening, and accepting feelings) and personal regard (proximity, courtesy, personal interest and compliments, etc.) were strands in this model.

Joyce and Weil (1986) recommended that teachers

who plan to use lectures with their classes should use advance organizers to strengthen students' cognitive structures and enhance retention of new information. The advance organizer is "introductory material presented ahead of the learning task and at a higher level of abstraction and inclusiveness than the learning task itself" (p. 76). This introductory material should be a scaffold on which students can "hang" the new ideas and concepts. According to Joyce and Weil, "the most effective organizers are those that use concepts, terms, and propositions that are already familiar to the learner, as well as appropriate illustrations and analogies" (p. 76-77).

Likewise, the classroom discourse method is a method that is advocated by educators. Gunter, Estes, and Schwab (1990) recognized that discussion has "a central place in good classroom teaching" (p. 150). It is this method that allows for elaboration and discussion between teachers and students. In addition, it is the "quality of these discussions that determines the extent and quality of the students' learning" (p. 149).

To make the classroom discourse method of

instruction most effective, Gunter, Estes, and Schwab recommended that a teacher spend time reading the material to be taught and preparing the questions. Gunter, Estes, and Schwab found that:

> The caliber of a discussion is directly dependent upon the caliber of the questions asked. Being able to generate thoughtful, productive questions is one of the most valuable skills a teacher can possess. (p. 150)

According to Gunter, Estes, and Schwab, there are three types of questions: factual, interpretive, and evaluative. A teacher needs to be able to understand the distinctions between these three types of questions in order to be able to generate provocative questions.

Harmin (1994) recommends that a class discussion can become an attentive discussion by the use of various techniques to keep the entire class engaged. These methods include shifting the discussion around the room and voting to shift the course of a discussion. Harmin cautions that "often discussions only stimulate the exchange of opinions and thoughtless chatter" (p. 41). As other educators have noted, Hamlin has found that discussions usually work best as

only part of a more rounded lesson.

The results of this study showed that cooperative learning strategies were effective in maintaining student engagement in the learning. Experts on cooperative learning have found methods that are needed for this method to be successful in raising the engagement level of students. Slavin (1980, 1987) emphasizes cooperative activity structure (success in the task requires contributions from all members), cooperative reward structure (group members are rewarded for group success), and individual accountability (the individual's contribution to the group's success is clear).

Johnson, Johnson, and Holubec (1988) recommend a less specific methodology. Their cooperative learning method is based on five elements: positive interdependence, face-to-face interaction, individual accountability, social skills, and group processing. Kagan (1992) has developed a series of structures that enable teachers to develop cooperative activities based on the content being studied combined with the cooperative structures. Kagan's structures have built in three basic principles of cooperative learning. The

principles are interaction, positive interdependence, and individual accountability.

A teacher as the decision maker in a classroom needs to make the best choices for use of the limited time that is allotted for instruction. Educational administrators must continue to recognize instructional strategies that will engage students and reinforce their usage with teachers. Educators should remember that there is "no easy route to a single model that is superior for all purposes, or even that should be the sole avenue to any given objective" (Joyce & Weil, 1986, pp. 4-5). Hopefully, the results of this study will enable teachers and administrators to recognize that cooperative learning techniques have a place among the many other models of teaching.

APPENDIX A

Request for Teacher Participation in the Research

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121 Chandler Court
Williamsburg, VA 23185
May, 1995

Dear Teacher,

Common sense indicates that students who pay attention learn more than students who do not pay attention. Since educators realize that it is necessary for a learner to be engaged in the learning process, they have constantly sought methods that will increase the engagement of learners. As a result, various instructional strategies have been shown to have differing effects on the engagement of students. Further research that helps to identify those instructional strategies that generate high levels of engagement of students is useful for educators.

The purpose of this research is to analyze the levels of participation of secondary students during various instructional strategies.

I plan to video tape at least three class periods of one of your classes during a two week span in May. I will need for you to help distribute and collect a letter of consent for each student (sample attached), to turn the equipment on and off, and to furnish me with a brief lesson plan for the two weeks. The names of any participant will only be known to this researcher and will not be part of any report either published or unpublished.

If you choose to participate, please sign this consent form and return to Wendy Geiger by Friday, May 19, 1995.

Thank you for your careful and prompt attention to this matter.

Thank you,

Wendy M. Geiger

____ I give permission for my class to be video taped for the purposes of educational research.
I acknowledge that the video tapes will be used for research purposes only and will be destroyed after the research is complete.

_____ _____
Name (Please Print) Signature

APPENDIX B

Request for Parental/Guardian Permission for Student Participation in the Research

W. M. Geiger
May 19, 1995

Dear Parent,

As an educator for over twenty years, I have always been interested in methods for increasing the engagement or active participation of students in the educational process. As part of my doctoral dissertation research at the College of William and Mary, I plan to study the effect that various instructional strategies (such as lecture, discussion, seat work, and group work) that are already being used by your child's teacher have on the engagement of the students.

Your child's teacher has agreed for your child's class to be videotaped for this research. The class will be video taped at least three class periods during a two week period in May. The names of any participant will only be known to the researcher and will not be part of any report either published or unpublished. In addition, the video tapes will only be viewed for the engagement of students during the educational process. Since only compiled data will be shared in any reports, this research will be independent from your child's grades, school records, etc.

This research has been approved by the Human Studies Committee of the College of William and Mary as well as by the Williamsburg-James City County Public Schools, the Lafayette High School administration, and your child's teacher.

Please indicate your preference in allowing your child to be video taped for this research by completing and signing the attached consent form and returning it to your child's teacher by Wednesday, May 23, 1995.

Thank you for your careful and prompt attention to this matter. If you have any questions concerning this project, please feel free to contact me at either 565-4209 (work) or 229-2986 (home).

Sincerely,

W. M. Geiger

APPENDIX C

Parental/Guardian Video-Taping Permission Form

Student Engagement Video Taping Permission Form

TEACHER'S NAME: _____

CLASS PERIOD/BLOCK: _____

SUBJECT: _____

____ I give permission for my child to be video taped for the purposes of educational research.
I acknowledge that the video tapes will be used for research purposes only and will be destroyed after the research is complete. I realize that my child or I may rescind this permission at any time by calling Mrs. Geiger or my child's teacher.

____ I do NOT give permission for video tapes of my child be used for this research.

_____
Name of Student (Please Print)

_____
Parent/Guardian Name (Please Print)

_____ _____
Parent/Guardian Signature DATE

Please return to you child's teacher by Wednesday, May 23, 1995

APPENDIX D

Observation Form

OBSERVATION FORM

Engagement of Students For Various Instructional Strategies

Teacher: _____ DATE: _____

Student #	Obs. 1	Obs. 2	Obs. 3	Obs. 4	Obs. 5	Obs. 6	Obs. 7	Obs. 8	Obs. 9	Obs. 10	Obs.11

L - Lecture
D - Classroom Discourse
C - Cooperative Learning
N/A - Non Instructional Activity

E - Engaged
N - Not Engaged

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VITA

Wendy Meadors Geiger

Birthdate: March 30, 1951

Birthplace: Newport, Rhode Island

Education:

1993-1996 The College of William and Mary
Williamsburg, Virginia
Educational Specialist

1982-1985 The College of William and Mary
Williamsburg, Virginia
Master of Science (Computer Science)

1973-1975 The College of William and Mary
Williamsburg, Virginia
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1969-1972 The College of William and Mary
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