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Comparative effects of short- and long-form guided notes on social studies performance by seventh grade learning disabled and at-risk students

Courson, Frances Hamilton, Ph.D.

The Ohio State University, 1989

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COMPARATIVE EFFECTS OF SHORT- AND LONG-FORM GUIDED NOTES ON SOCIAL STUDIES PERFORMANCE BY SEVENTH GRADE LEARNING DISABLED AND AT-RISK STUDENTS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Frances Hamilton Courson, B.S., M.A.

* * * * *

The Ohio State University

1989

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In memory of my mother,

Verna Brown Hamilton
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Finally, I want to thank my husband, Harold, and daughters, Cynthia and Jacquelyn, for their love and understanding.
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CHAPTER I
INTRODUCTION

Lecture-based instruction is widely used at the middle school and high school levels. The teacher talks about the subject matter and the students are held responsible for remembering the facts and concepts that the teacher has presented. Evaluation of student learning is often in the form of tests. Students are usually expected to take notes over the material as the teacher presents it. If the student has taken good notes, he or she has an outline of the main ideas and related points which can be studied in preparation for future tests. Students who take good notes and then study their notes are more likely to make higher academic gains and receive higher test scores than are students who only listen to the lecture and read the text (Baker & Lombardi, 1985; Carrier, 1983; Kierwa, 1984).

With the mainstreaming movement has come the need to effectively educate students with learning disabilities and other handicapped and at-risk students in the regular classroom. Classroom teachers have expressed concern
about teaching content subjects such as science and social studies to mildly handicapped students in the middle school, junior high school, and senior high school (Lovitt, Rudsit, Jenkins, Pious, & Benedetti, 1985). If content subject teachers are to successfully educate handicapped students, certain aspects of the educational environment must be modified (Lovitt, Rudsit, Jenkins, Pious, & Benedetti, 1986).

It is not uncommon for a middle school or high school student with learning problems to be mainstreamed into a regular classroom in which large amounts of complex academic material is presented daily. Students with learning problems often also have problems identifying and writing down the important concepts/facts in a lecture. Unfortunately, strategies and skills for effective notetaking are seldom taught to mildly handicapped students (Saski, Swicegood, & Carter, 1983). Additionally, in order to be an effective notetaker, well developed language and motor skills are required which learning disabled and at-risk students frequently lack (Vogel, 1982).

The primary task of the classroom teacher is to present information in such a manner that student learning is maximized. Research confirms what good teachers have always known: what and how much a student learns depends
to a large measure on how he or she spends the allotted classroom time (Zigmond, Sansone, Miller, Donahoe, & Kohnke, 1986).

The extent to which students make active responses to the subject matter during instruction is an important factor in academic achievement. Carta and Greenwood (1988) found that at-risk youngsters in inner-city classrooms had less "opportunity-to-respond" in their classrooms than students attending suburban schools. Students in inner-city schools spent less time reading, writing, and actively engaged in academic behaviors than did students in suburban classrooms. The amount of academic engagement by students was related to the way in which instruction was delivered in the classrooms. Becker and Carnine (1978) reported that academic instruction which was taught in structured daily sessions characterized by a high degree of student responding produced the highest levels of student achievement.

Bloom (1980) points out that the amount of time the student is actively engaged in academic responding is a variable controlled by the teacher and one that can be altered. The efficient teacher plans classroom activities in such a way that students have maximum opportunity to make responses to academic stimuli. Skinner (1984) contends that by using instructional time more efficiently, students could be taught twice as much in the
same amount of time with no increased effort on the part of the teacher.

As one method of increasing the amount of time students spend making active responses, researchers have recently looked at a form of structured notetaking called guided notes (Kline, 1986; Pados, 1989; Virgalitte, 1988; Yang, 1988). Guided notes are designed to help students take accurate classroom notes while providing greater levels of active student response during instruction. Guided notes cue the student to the points in the lecture the teacher considers most important and provide a blank space, line, or other area for recording the key concepts/facts.

**Purpose of the Study**

This study evaluated a notetaking strategy, guided notes, as a method for increasing academic achievement. The study was conducted in a regular seventh grade social studies classroom in a suburban public middle school. The class was part of a school-wide skills development program for students identified as learning disabled and academically at-risk.

Two forms of guided notes were used: a short-form on which the student filled in single words or a group of words in blanks on the guided notes form and a long-form on which the student wrote in information from the teacher's lecture in phrases or complete sentences.
The primary dependent variable in the study was student scores on daily quizzes. Maintenance of achievement was measured by bi-weekly tests. The percentage of lecture concepts/facts accurately recorded by students was also measured. Generality of improved notetaking was assessed when the guided notes were withdrawn and students were again taking their own notes.

**Research Questions**

1. Does the use of guided notes during social studies lectures result in higher scores on next-day quizzes than does a baseline condition in which students take their own notes?

2. Does the use of short- and long-form guided notes during social studies lectures produce differential scores on next-day quizzes?

3. Which of the three methods of notetaking—student's own notes, short-form guided notes, or long-form guided notes—produce the highest scores on bi-weekly social studies tests?

4. Do students accurately record a larger percentage of lecture concepts/facts with guided notes than they record when taking their own notes?

5. Does the use of guided notes result in improved student notetaking when the guided notes are removed?

6. How long does it take to prepare the two types of guided notes?
7. What are students' preferences and opinions regarding the three methods of notetaking used in this study?

**Terminology**

The terms and definitions used in this study are listed below.

**Accuracy of long-form guided notes:** For a concept/fact from the teacher's lecture to be considered as accurately recorded on the long-form guided notes, the student must have recorded at least the key term from the concept/fact by the appropriate asterisk (*) on the guided notes form. The exact words of the concept/fact were not required but there could be no erroneous information recorded for that concept/fact. If a concept/fact had more than one asterisk under it, a correct key word must be written by each asterisk for the student to receive credit for that concept/fact being accurately recorded. Correct spelling and complete sentences were not required.

**Accuracy of short-form guided notes:** For a concept/fact to be considered accurately recorded on the short-form guided notes, each blank for that concept/fact must be filled in with accurate information. If a blank was not filled in, that concept/fact was considered inaccurate. Correct spelling was not required.
Accuracy of student's own notes: In checking for accuracy when students took their own notes, the key word in each concept/fact from the teacher's outline must have been recorded with no erroneous information about that concept/fact for the information to be counted as accurate. Correct spelling and complete sentences were not required.

At-risk: Students judged by school personnel to be likely to experience problems in academic learning based on a review of standardized test results, overall grade point average of below 2.5, and general response to the expectations of the school. They are students who have difficulty with abstract learning and make slow progress in completing the requirements for their assigned courses.

Bi-weekly test: A test of 20 items administered on the Monday following 2 weeks of daily lectures. Included in the test were 10 items which served as the daily quiz for the previous Friday's lecture. The first 15 items were multiple choice recognition questions with four possible answers. The first five questions were scored as part of the daily quiz covering the previous session's lecture. The remaining 10 recognition questions were scored as part of the bi-weekly test. Items 16-30 were recall questions which could be answered with one word or
short answers. Items 16-20 completed the daily quiz while Items 21-30 completed the bi-weekly test. Of the 20 questions that made up the review section of the bi-weekly quiz, at least one recognition and one recall question was taken from each of the lectures covered by the test. (See Appendix F.)

**Daily quiz:** A 10-item test over the concepts/facts of the previous session's lecture. Each quiz consisted of five recognition questions (multiple choice with four choices) followed by five recall questions that required the students to fill in blanks with one word or a short answer. (See Appendix E.)

**Generality on notetaking:** The extent to which students accurately recorded a higher percentage of lecture concepts/facts during the second phase of taking their own notes than they did during the initial own notes phase. An increase in accurate notetaking may represent stimulus generalization from the guided notes condition to the own notes condition.

**Guided notes:** A handout that "guides" a student through the material to be covered in a lecture by a format with cues and specific space for the student to write key facts, concepts, and/or relationships.

**Instructional transparencies:** Transparencies for overhead projection made from the lecture outline. The lecture outline was printed on a dot matrix printer
and enlarged by 155% before making the transparency. 
Each lecture had from two to three instructional transparencies. These transparencies were marked with colored markers to underline or circle key words or phrases as the teacher lectured or summarized her lecture. (See Appendix B.)

Lecture outline: A typewritten outline of 12-14 main ideas or concepts/facts from which the teacher delivers the lecture to the class. (See Appendix B.)

Long-form guided notes: A format for guided notes on which the student writes in phrases or sentences the key concepts/ideas from the lecture. An asterisk (*) is used to indicate that the student should write an answer in the space that follows. (See Appendix D.)

Maintenance: This durability of response over time is demonstrated when the student correctly answers social studies questions on the bi-weekly test which is administered every 2 weeks.

Progressive disclosure: Using a sheet of paper to progressively uncover and project each key concept or fact on the instructional transparency of the lecture outline as it is being discussed by the teacher.

Public posting chart: A large chart in the front of the classroom which displays the students' daily scores for a week, each student's best score, each student's
highest weekly score, and the total class score for each day of the week.

**Short-form guided notes**: A format for guided notes on which the student fills in blanks with one word or short phrases. (See Appendix D.)

**Skills development program/classes**: A program initiated just prior to the beginning of this study by the principal and the faculty of the school. The program consisted of social studies and science classes set up especially for learning disabled and at-risk students. These classes are jointly taught by a regular classroom teacher and the learning disabilities resource room teacher. Parental consent was required for students to be placed in these classes.

**SLD resource student**: A student in the study who was identified as having specific learning disabilities (SLD) according to the rules of the Ohio State Department of Education and who received some of his or her daily academic instruction in a resource room for SLD students.

**Tutored LD student**: A student in the study who was identified as having specific learning disabilities (SLD) according to the rules of the Ohio State Department of Education and who received some of his or her daily academic instruction from a SLD tutor.
CHAPTER II
REVIEW OF THE LITERATURE

This chapter reviews the research and professional literature relevant to this study. The academic performance of secondary students with learning disabilities is examined, followed by a discussion of factors associated with students who are considered academically at-risk. Because guided notes can be viewed as a means of increasing active student response, this review briefly discusses several methods for increasing each student's opportunity to respond during group instruction. However, the importance of notetaking and its relationship to academic achievement comprises the major focus of the review.

Students with Learning Disabilities

The question of what actually constitutes a learning disability (LD) is one that, at the present time, is still being debated. Problems arise when school personnel attempt to differentiate LD students from those students who fail to meet academic standards, those students who traditionally were called "slow learners".
A great deal of guesswork is often involved in the diagnosis (Epps, Ysseldyke, & McGue, 1984) because there is no generally accepted diagnostic instrument that can discriminate the truly learning disabled child (Friedrich, Fuller, & Davis, 1984). A learning disability is inferred when there is a significant discrepancy between academic potential, as measured by standardized tests and actual school performance (Gregory, Shanahan, & Walberg, 1985).

When attempting to answer the question of "Who is learning disabled?", diagnostic efforts focus to a large extent on determining what the child is not. When identifying a child with learning disabilities, personnel must follow state and local school system guidelines which require that there be a discrepancy between the child's potential and the child's actual academic achievement. Students who have learning problems that are primarily the result of visual, hearing, or motor handicaps, of mental retardation, emotional disturbance and/or of environmental, cultural, or economic disadvantages are not labeled as LD. Finally, the child must need special education services in order to be eligible for LD placement.

While definitions of the term "learning disability" exclude children who are mentally handicapped, in a study
that investigated the characteristics of students served as learning disabled in Child Service Demonstration Centers (CSDC), Norman and Zigmond (1980) found that there was a lack of consistency in the characteristics of students labeled as LD. They reported that 54% of the centers were serving students with IQs at or below 69. Their findings showed that LD was not limited to wealthy, suburban areas nor to the poor, urban population. They did, however, find that learning disabilities was predominately a male phenomenon. Male LD students in the centers outnumbered females by almost 4 to 1. More recent research has found that a disproportionate number of minority children are now being labeled as LD. Members of lower socioeconomic and minority groups are overrepresented among learning disabled high school seniors (Gregory, Shanahan, & Walberg, 1986). Brobnan (1983), for example, found that low socioeconomic school districts had twice as many students in LD classes as did high socioeconomic districts.

LD students also have been found to have a higher incidence of other handicapping conditions such as visual handicaps, speech handicaps, hearing impairment, orthopedic handicaps, etc. (Gregory, Shanahan, & Walberg, 1986). Additionally, LD students in high school were significantly older than their nonhandicapped peers (Gregory, Shanahan, & Walberg, 1986).
Characteristics of Adolescents with Learning Disabilities

Heward and Orlansky (1988) state "...the single, fundamental characteristic of children with learning disabilities (LD) is a specific and significant achievement deficit in the presence of adequate overall intelligence" (p. 136). Mercer (1987) states that, in addition to academic deficits, an adolescent with learning disabilities may have cognitive deficits, deficiencies in study skills and/or learning strategies, social skill deficits, and/or motivational problems.

Academic deficits. Historically, most definitions of learning disabilities require that a severe academic deficit be present (Gregory, Shanahan, & Walberg, 1985). Mercer (1987) states that the primary characteristic of LD adolescents is poor academic achievement. Learning disability is, for the most part, a school related disorder wherein a child has difficulty with academic tasks and fails to achieve to his expected level (Kavale & Forness, 1986). Cone, Wilson, Bradley, and Reese (1985) who studied 1,839 students in LD programs in Iowa found that 75% of these students were labeled as LD while in the elementary grades. The mean IQ for this group of students was 95. They found that these LD students experienced more academic problems in reading and spelling than they did in mathematics. An additional finding was that as the LD students' grade level
increased, their level of academic achievement decreased progressively.

Cognitive deficits. Research from the field of developmental psychology suggests that children with learning disabilities may perform poorly on many academic tasks because they have not yet developed the cognitive skills necessary to become successful learners. Students with learning disabilities often perform poorly on tasks that are used to measure attention, short-term memory, and perceptual skills (Torgesen, 1977).

Deficiencies in study skills and/or learning strategies. Torgesen (1977) reports that students with learning disabilities are more passive in their approach to tasks and that their poor performance may be due to their failure to use efficient strategies. For instance, students with learning disabilities often have difficulty asking appropriate questions and may be unable to gain information that they need (Fine, 1987).

Adolescents with learning disabilities generally lack effective study habits (Vogel, 1982). They usually have trouble outlining, organizing, and summarizing the information they hear in the classroom lecture. Students with learning disabilities sometimes have trouble with the allocation of their time among tasks and often do not allow themselves enough time to finish these tasks (Heron & Harris, 1987). It is important that students with
learning disabilities be taught not only to organize the material from the lecture but also to use their allotted time wisely (Shields & Heron, 1989).

**Social skill deficits.** Although any group of students with learning disabilities will contain youngsters with a broad range of abilities, differing degrees of motivation, diverse personality traits, and very different social skills (Hall & Keogh, 1978), Alley and Deshler (1979) consider it critical that adolescent LD students be taught appropriate social skills. While lack of social skills is not included in the federal definition of learning disabilities, many investigators have listed social skills deficits as one of the manifestations of the disability (Bryan & Pflaum, 1978; Dickstein & Warren, 1980). Siperstein, Bopp, and Bak (1978) note that adolescents with learning disabilities are likely to experience social and affective difficulties. The deficit in social skills makes adolescent LD students more vulnerable to negative social forces than their nonhandicapped peers (Fine, 1987). The student with learning disabilities is more submissive and less persuasive than nondisabled peers (Bryan, Donahue, & Pearl, 1982). Additionally, adolescents with learning disabilities reported more serious trouble with the law than did their normal peers (Gregory, Shanahan, & Walberg, 1986).
While Siperstein, Bopp, and Bak (1978) found that students with learning disabilities were less popular than academically successful students they reported that the LD students were not necessarily rejected.

Motivational problems. The search for self-esteem is a part of the developmental pattern for youngsters. A "normal" child can earn self-esteem by academic achievement (McWhirter, McWhirter, & McWhirter, 1985). This avenue of developing self-esteem is closed to the LD youngster who is experiencing academic failure. Therefore, it is no surprise that, when compared to normally achieving students, students with learning disabilities were found to have lower academic expectations and academic self-concepts (Hiebert, Wong, & Hunter, 1982; Larsen, Parker, & Jorjorian, 1973). Additionally, students with learning disabilities are often characterized as having a high degree of "learned helplessness" (Pearl, Bryan, & Donahue, 1980, p. 3). It is a common observation that many LD students are not motivated to improve their academic skills (Adelman & Taylor, 1983). While many characteristics of adolescents with learning disabilities have been identified, the primary characteristic is that of academic deficits (Heward & Orlanskey, 1988).
Academic Performance of Adolescents with Learning Disabilities

In looking at how the learning disabled adolescent performs academically, it is interesting to note that a student may be academically gifted in one area yet learning disabled in another (Vogel, 1982). Most adolescent LD students, however, have a history of general academic failure.

Educators are expressing concern because many students with learning disabilities who receive special education services in a resource room setting are not successful in the regular classroom. This lack of success is most apparent in students in the upper grades. Anderson-Inman (1986) attributes this failure, in part, to the fact that instruction in resource rooms is often very different from instruction in regular classes. Resource teachers often use a different curriculum, instructional groups are smaller than regular class, and reinforcement is more frequent.

Adolescents with learning disabilities pay a high price because their academic achievement is less than the academic achievement of their normal peers (Hiebert, Wong, & Hunter, 1982). It is difficult for the LD student to survive the academic expectations of regular class teachers on the secondary level. Moran's study (cited in Mercer, 1987) of oral language expectations in
secondary content-area classes found that teachers rely heavily on the lecture format in conducting classes and that they address the majority of their questions to the whole class rather than to individual students. She reported that regular teachers used few advanced organizers to help students listen and take more effective notes. Because the teachers lectured at a rapid pace, only the students with excellent notetaking skills were able to take notes that were meaningful for future study. Finally, Moran noted that the regular classroom teacher gave little oral feedback or reinforcement.

It is assumed that by the time students reach the secondary level, they have mastered reading, writing, spelling, mathematics, and spoken language well enough to use these skills to help them learn. Unfortunately, most LD students have not mastered the basic skills to a level that would allow them to keep up with the academic demands of junior or senior high school (Alley & Deshler, 1979).

In a study of how LD students spend their classroom time, Thurlow, Ysseldyke, Graden, and Algozzine (1984) found that the students were engaged in management tasks (e.g., getting out and putting up books, looking for materials, waiting to be called upon, and moving to other classroom areas) for the greatest amount of classroom
time (95 min). LD students were engaged in active academic responses for 43 minutes per school day, while inappropriate responses accounted for 30 minutes of each day. Thurlow et al. also found, in this study of 26 students in five levels of LD placement which ranged from Level 1 where the student received indirect LD service in a regular classroom through Level 5 in which all services were obtained in a self-contained LD classroom, that LD students in more restrictive placements do not receive more opportunities for active academic responding than do LD students in less restrictive environments.

Richey and McKinney (1978) compared 15 normal boys with 15 boys with learning disabilities and found that the LD subjects were significantly more distractible than the normal subjects. Since distractibility has been shown to be negatively associated with achievement, it is a behavior that should be taken into account when planning classroom instruction.

While the LD students often have short attention spans, when these students are given clear task demands in a structured work setting, the students are able to achieve academically (Hall & Keogh, 1978). Structure is necessary for LD youngsters because they often lack the skills to manage their own behavior and to perform tasks that are age-appropriate (McWhirter, McWhirter, & McWhirter, 1985).
Summary

Students with learning disabilities can improve their academic achievement with special instruction, however, the support that they need is not often available in the regular classroom. Much of the instruction in the regular classroom is lecture based and learning disabled students do not have good listening, notetaking, or study skills that are needed for academic success in the mainstream. Students on a secondary level are expected to work independently, often with little teacher feedback. They must complete homework assignments, follow classroom rules, take accurate notes, and study materials written on a junior high or high school level. They must be able to take tests, express themselves in writing, and participate in classroom discussions (Mercer, 1987). Additionally, they are expected to display appropriate social skills.

While a universally accepted definition of learning disability does not exist, several characteristics of students identified as learning disabled can render the academic expectations at the middle and secondary school devastating. It is, therefore, critical that educators identify methods for increasing the academic achievement of the LD adolescent and implement these practices in the classrooms serving handicapped students.
At-risk Students

Most public high schools have a relatively low dropout rate. The percentage of school dropouts in 1980 was less than 16% (U.S. Bureau of the Census, 1985, Table 215). However, some inner city high schools are reporting dropout rates of as high as 40 and 50 percent (Wehlage & Rutter, 1986). In an effort to reduce the dropout rate, educators are attempting to identify the characteristics associated with at-risk youngsters and to provide these students who would appear to be potential school dropouts with worthwhile educational experiences.

Defining who is the academically at-risk student varies depending upon who assumes responsibility for the definition. Social agencies, for instance, define at-risk in terms of what the student lacks. An at-risk child may lack a parent or the child may have had limited experiences such as travel. The schools define the at-risk child as one who has low scores on achievement tests, one who fails to meet minimum academic achievement requirements, and/or one who has a chronic history of absenteeism (Bowling, 1988).

Students at-risk of leaving school before high school graduation have long been a serious problem for both educators and society as a whole because most dropouts do not have the educational training to enable them to function as successful wage earners. The concern
for the education of students who are educationally at-risk of dropping out of school has increased in recent years even though there has been a decline in the percentage of school dropouts over the last 40 years (Rumberger, 1987).

It is important that at-risk youngsters be identified as early as possible. The earlier a student is identified as an at-risk student, the more likely it is that a dropout prevention program for that child will be successful (Rumberger, 1987). Research has shown that students at-risk of dropping out of school show signs early in their elementary school careers that should alert educators to the fact that these children are impending dropouts (Stroup & Robins, 1972).

Factors Associated with At-risk Students

There is a wide range of factors associated with dropping out of school. Rumberger (1987) assigns these factors to the major categories of demographic, family-related, peer-related, school-related, economic, and individual.

Demographic factors. Data from the High School and Beyond, a national longitudinal study of American high school students, indicate that students of Hispanic background are more likely to drop out of school than are black students, and black students are more at-risk of dropping out of school than are white students (Ekstrom,
Goertz, Pollack, & Rock, 1986). While studies show that minority students are much more likely to become school dropouts than are white students, Wehlage and Rutter (1986) state that after controlling for family background, race is not a factor that predicts dropouts.

The region of residence is a factor in the prediction of at-risk youngsters. Whites in the South are more likely to become school dropouts than whites in other regions, while blacks in the South are less likely to quit school before graduation (Ekstrom et al., 1986).

Males are somewhat more likely to become school dropouts than female students (Rumberger, 1987). However, black female students have a higher dropout rate than black males (Ekstrom, 1986). About half of all females who drop out of school do so because of pregnancy and/or marriage (Wehlage & Rutter, 1986).

**Family-related factors.** Family background is a powerful predictor of whether or not a child will complete his or her high school education (Rumberger, 1983). Lack of family encouragement to succeed in elementary school has been associated with high school dropouts (Ekstrom et al., 1986; Stroup & Robins, 1972). If the student comes from a single parent home or from family in which the parents have little formal education, work for low or minimum wages, speak a language other than English, the youngster is at greater risk for
becoming a school dropout (Ekstrom et al., 1986; Rumberger, 1987; Wehlage & Rutter, 1986).

Natriello, McDill, and Pallas (1985) note that students from single parent family homes are twice as likely to drop out of school as students who live in homes with both parents present. Ekstrom et al. (1986) report that the mothers of school dropouts were likely to be working and were less interested or less able to monitor what their children did in school and after school hours. The homes of potential dropouts had fewer study aids and the children had fewer opportunities for learning activities not related to school.

Peer-related factors. Although the extent to which peers influence a student to drop out of school is not clear, dropouts have friends who also are school dropouts (Rumberger, 1987). Some students may be dropping out of school in response to peer pressure (Orr, 1987). Students who dropped out of school reported, in their sophomore year, that they spent more time dating and riding around than did the students who graduated (Ekstrom et al., 1986). Students who stayed in school tended to have friends who planned to attend college and were interested in school (Ekstrom et al., 1986).

School-related factors. Hall and Keogh (1978) found two school-related factors that place a child at-risk. These are academic aptitude, such as IQ, verbal ability,
and achievement level in math and reading, and behavioral adaptability such as how the child gets along with teachers and peers. Academic signals that a youngster is at-risk of dropping out of school can be detected in elementary school. Lloyd (1978) found that as early as the third grade, there was a surprising number of characteristics that separated students who would later graduate from those who would drop out of school. These include failing to be promoted in the early grades, absenteeism, truancy, transferring from one school to another, and generally, not liking school (Orr, 1987). Non-promotion in the first three grades was a strong indicator of a potential dropout (Lloyd, 1978).

In high school, academic signals for dropping out of school include failing required school subjects, skipping classes, and resisting the authority of teachers (Stroup & Robins, 1972). Earning low grades is probably the most common factor correlated with dropping out of school. Students who are working below grade level or who have failed one or more grades are at a greater risk of dropping out of school than students performing at grade level and those students who have not repeated a grade (Natriello, McDill, & Pallas, 1985).

There is some evidence that a relationship exists between discipline problems and school dropouts (Ekstrom et al., 1986; Wehlage & Rutter, 1986). Expulsion and
suspension indicate behaviors that often lead to dropping out of school. This is not so surprising that students who receive negative feedback in the school setting want to leave that environment (Natriello, McDill, & Pallas, 1985).

Students who dropped out of school reported lower school grades, lower test scores, and that they did less homework than did students who remained in school until graduation. The typical dropout reported more grades of C; whereas, the student who graduated reported grades that averaged B. Low grades were more important in the decision for whites and Hispanic students to quit school than they were for blacks. Poor mathematics skills for white students were related to dropping out of school (Ekstrom et al., 1986).

While dropouts reported that they spend less time reading than students who remain in school, they were also less likely to participate in athletics and take part in other extracurricular activities (Ekstrom et al., 1986).

Many students who drop out of school attend schools that have poor facilities and inadequate teaching staffs which could affect their school performance and have an influence on their decision to leave school prior to graduation (Fine, 1986).
Economic factors. Students from lower socioeconomic status families are far more likely to become school dropouts than are students from families of higher socioeconomic status (Ekstrom et al., 1986; Natriello, McDill, & Pallas, 1985; Rumberger, 1983). Rumberger (1987), in a review of the findings of the National Longitudinal Survey of Young Americans, reports that about 20% of the school dropouts left school because they felt that they had to work to help out their families. Dropouts were more likely to be holding down a job before dropping out of school. Dropouts were earning more money during their sophomore year than non-dropouts. The students who later dropped out of school were working more hours and for a higher hourly wage than non-dropouts. Dropouts reported that they enjoyed their jobs more and felt that their jobs were more important than school (Ekstrom et al., 1986).

Individual factors. Individual factors associated with dropping out of school include low levels of self-esteem and less sense of being able to take control of their lives (Ekstrom et al., 1986; Rumberger, 1987). Students who drop out, typically, do not find school a satisfying experience and have low educational and occupational goals (Ekstrom et al., 1986; Wehlage & Rutter, 1986).
Many dropouts reported that they left school to get married or because they were pregnant (Ekstrom et al., 1986). Natriello, McDill, and Pallas (1986) note that 8 of 10 teenagers who become mothers at the age of 17 or younger do not finish high school. Responses to the National Longitudinal Survey of Young Americans indicated that 41 percent of the black females, who dropped out of school, did so because of pregnancy. Seventeen percent of all females in the survey listed pregnancy as their reason for dropping out of school (Rumberger, 1985). Dropouts, as a rule, tend to be older than other students on their grade level (Ekstrom et al., 1986).

Summary

Early identification of students who are likely to drop out of school is not an easy task. Any group of at-risk students contains youngsters with a wide range of abilities, personalities, motivations, and skills. Remediation and intervention strategies often need to be individualized (Hall & Keogh, 1978).

A critical variable in the identification of the at-risk child is school performance as measured by grades and test scores. The student's home environment also has a vital impact on the decision to leave school. It is important to identify potential dropouts as early as possible and to begin interventions at the first indication that the child is at risk. Educators should
look for signs such as disciplinary problems, poor
grades, and poor attendance and be prepared to intervene
as soon as these appear.

Increasing Active Student Response

In a search to make the school experience more
meaningful for potential dropouts, educators have focused
on improving the poor academic performance of at-risk
youngsters. Experimental studies have examined
increasing academically engaged time by planning for more
active student response as a means of improving student
achievement. Research supports the premise that when
active student responses increase, academic achievement
improves (Anderson, 1981; Greenwood, Delquadri, & Hall,
1984; Pratton and Hales, 1986). Many classroom teachers
find it difficult to provide for a large number of active
student responses during group instruction. There are,
however, numerous strategies that a teacher can use which
allow the student to actively respond during group
instruction (Heward, Courson, & Narayan, 1989). These
strategies include rapid pace presentation, choral
response, response cards, timed trials and feedback, peer
tutoring, and guided notes (Heward, Cooke, & Test, 1987).

Rapid Pace Presentation

Carnine (1976) measured the differential effects of
teacher presentation rate on off-task behavior, answering
correctly, and participation of a boy and a girl in a
classroom for low-achieving first graders. These two students, along with two others, received 30 minutes of reading instruction from the Level I Distar Reading (Engelmann & Bruner, 1974). A slow presentation rate of a 5 sec delay between presentations was compared with a fast presentation rate of 1 sec or less in an ABABAB design. During the fast presentation pace, students exhibited much higher percentages of classroom participation, correct answers, and on-task behavior than during presentations with a 5 sec inter-trial-interval. Morgan (1987) found a similar pattern of results, though not such a dramatic difference, with a 3 sec versus a 1 sec inter-trial-interval with older severe behavior handicapped students. When students are required to respond to each teacher presentation during the lesson, they have more opportunities for active response and can receive more corrective feedback from the teacher.

Choral Response

Choral responding is in unison oral responding by all members of a group to questions or problems posed by the teacher. Although choral responding is not a new idea--it was used by teachers in the one-room school house--its use today is generally restricted to teachers in primary classrooms and teachers of foreign languages (Heward, Courson, & Narayan, 1989).
Sindelar, Bursuck, and Halle (1986) compared the effects of ordered questioning and choral responding on sight word acquisition by 11 elementary mildly handicapped (LD or mentally retarded) students. Instruction took place in three groups of three or four students. In the ordered questioning condition, the teacher called on the students in a right to left sequence. In the choral responding condition, all students answered at the same time on the cue of "Everybody". Results showed that choral responding resulted in a slight, but significant, increase in the rate of learning new sight words and in the correct identification of these words on the posttest.

McKenzie and Henry (1979) compared a version of choral responding in which the students as a group responded by raising their hands or pointing to an object with individual student responses. This study involved 52 third graders in science class. The students taught by the in-unison response method were off-task during instruction at one half the frequency of off-task behavior by students in the individual response group. The in-unison group averaged 28 items correct on the 30 item posttest compared to 19.6 for the individual response group. Choral responding can be an effective, no-cost intervention that can increase active student responding and academic achievement.
Response Cards

Response cards are cards, signs, small chalk boards, or items which can be held up by each student in the group in response to a teacher's question (Heward, Cooke, & Test, 1987). Response cards allow each student in the group to respond to every question posed by the teacher. The teacher can look at these response cards and easily discern individual student responses.

Response cards are of two types--pre-printed and write-on. Pre-printed cards have the individual student responses already printed on them. The student selects, from a group of cards, the card with the correct answer and holds it up in response to the teacher's question. Write-on response cards require the student to write the correct answer before holding up his or her card. An advantage of pre-printed response cards is that students can answer questions quickly allowing the teacher to ask a greater number of questions. A disadvantage is that only recognition questions can be used (Heward, Cooke, & Test, 1987).

Write-on response cards allow the teacher to ask both recognition and recall type questions. The disadvantages of write-on response cards are that it takes the student longer to write the answer and the teacher may have trouble reading some students' handwriting. Although write-on response cards do require
more time for writing of the answer, the use of write-on response cards allows many more opportunities for active student response than does the traditional method of having the teacher ask a question, then call on one student for an answer (Heward, Cooke, & Test, 1987).

Wheatley (1986) studied the effects of using 3 x 5 inch laminated cards which the students displayed in response to questions on money. Nine students ages 13-16 in a public middle-school class for developmentally handicapped students were taught money skills which included writing money, counting money, calculating correct change, and multiplying money. Each student had a set of response cards printed with the numbers 0-9 and the words True and False. She found that the students in the study were able to make twice as many responses with the cards as opposed to raising their hands and being called on by the teacher for individual responses. The mean test scores increased from 76% with handraising to 82% with response cards.

Narayan (1988) compared the effectiveness of write-on response cards with hand raising and also compared the effectiveness of pre-printed response cards with the hand raising procedure in which only one student gets called upon to answer the question. The write-on response cards were 12 x 9 inch white laminated particle boards on which the students wrote answers to teacher
posed questions with dry erase markers. Pre-printed response cards were 5 x 7 inch color coded cards with responses written on them. The students selected and held up a card in response to questions from the teacher. Narayan found for this social studies class of 20 fourth graders that the two types of response cards were superior to handraising in terms of rate of student response, response accuracy, and scores on daily and review quizzes. Narayan noted that response cards provided many opportunities for active student response during large group instruction while giving the teacher the ability to discern individual student responses and to provide effective feedback.

A very impressive finding of the Narayan study was that with the pre-printed student response cards, each student was able to answer an average of 87 questions during each 20-minute review session. If students used pre-printed response cards in a 20-minute review session each day and responded at the rate they did in this study, each student would have over 15,000 opportunities to respond during a school year (Narayan, Heward, Gardner, Courson, & Omness, 1988).

**Timed Trials and Feedback**

Timed trials involve telling the students that they will be timed for a fixed period of time (usually just 1
or 2 minutes) and that on the signal, they are to work as quickly and as accurately as possible the assignment given them. Timed trials are used in order to obtain data on the rate at which students perform academic tasks. Van Houten (1980) reports several studies showing that the simple operation of explicitly timing a behavior for a short time period resulted in increased performance. For example, he suggests using daily timed trials to see how many multiplication facts each student can correctly work in a minute as a method of building proficiency. Other types of math facts could be used such as addition, subtraction, or division. With timed trials, the teacher gives each student a sheet of paper with more math facts than he or she can possibly work in a minute. The student is told that there are more problems than he or she can work, but as many problems are to be worked as possible. On the signal to "Start", students begin working. One minute later the teacher tells the students to "Stop". After papers are checked, the number correct for each student is posted. Timed trials are used daily in the practice stage of learning. The timed trials plus a feedback chart increased both rate and accuracy of math performance (Van Houten, 1980).

Peer Tutoring

When properly conducted, peer tutoring provides a high level of active student response (Cooke, Heron, &
Heward, 1983). Peer tutoring, which is one student providing academic instruction to another student, has been recommended as a cost effective intervention for providing effective classroom instruction for students of varying ability levels (Parson & Heward, 1979). Piggot, Fantuzzo, and Clement (1986) reported that peer tutoring increased math performance of underachieving fifth-grade students. Peer tutoring has been found to be an effective technique for improving sight word recognition skills of first graders (Heron, Heward, Cooke, & Hill, 1983), and for greatly improving the spelling performance of learning disabled students in a regular third grade classroom (Delquadri, Greenwood, Stretton, & Hall, 1983).

Carta and Greenwood (1988), in summarizing 4 years of research on a classwide peer tutoring system, reported that peer tutoring improved academic achievement and social interaction among the students involved. They found that students participating in peer tutoring spent 27% of the time reading aloud as compared to 2% in the teacher's procedure. Silent reading time increased from 4% to 34% with peer tutoring, and additionally, students' accuracy reading rate doubled.

Jewett (1988) studied cross-age reciprocal peer tutoring of math acquisition with eight learning disabled resource room students ages 9.3 to 11.6 years.
She found the students to be successful as peer tutors. The results indicate that all students made gains in acquisition of math facts during the peer tutoring intervention. The mean number of learning trials of math facts, with sums of less than 20, per minute during peer tutoring was 10.7 with a range of 5.0-24.8.

**Notetaking and Its Relationship to Achievement**

Students in the middle and high school grades are expected to learn numerous facts and concepts daily. For this reason, they need to acquire notetaking skills in order to be successful learners and to be more successful on the tests that they must take (DeBruyn, 1988). Studies have found that students who take notes in class and study these notes make greater academic gains than do students who listen in class and read the textbook (Baker & Lombardi, 1985; Collingwood & Hughes, 1978; Smith, 1984).

While notetaking is generally regarded as an important and necessary study skill; it is seldom taught directly to students. There are a variety of notetaking methods being used today; but no one method of notetaking is perfect for all purposes (Eidson, 1984). Shaw (1981) states that notetaking is not taught directly because it is difficult to teach. One of the reasons for this difficulty is that no two people take notes exactly alike.
Fowler (1985) reports that students are often required to copy notes made by the teacher. He lists the reasons for copying teacher-made notes as: (1) students do not understand the printed material; (2) students are not good listeners in class; (3) students are not skilled in notetaking; and (4) notetaking helps students to study. Fowler feels that the reason students do not take their own notes in class is that they have not learned notetaking skills. Most students in middle school and high school have little opportunity to practice by actually taking their own notes.

Eidson (1984) states that notetaking skills are acquired slowly. Sufficient time must be allowed for students to practice notetaking if they are to become successful notetakers. For the LD student, the task of taking notes during a lecture can be overwhelming. Notetaking requires listening, comprehending, extracting the main idea of the material being presented, and at the same time remembering the information long enough to write it down. The act of writing is also frustrating for the LD student as there must be speed in the formation of letters and these letters must be legible with the words correctly spelled if the notes are meaningful for review (Vogel, 1982).
Research on Notetaking

In a review of notetaking research, Carrier (1983) reached the following conclusions: (1) students learn more from a lecture if they take notes rather than simply listen to the lecture; (2) students learn more from the lecture if they take notes and then review those notes; (3) the teacher can assist student notetaking by providing a clear organizational framework and by highlighting important information; and (4) different notetaking strategies may be required for students with differing ability levels.

In answer to the question, "Why take notes?, Pauk (1979c) replies that it is because humans are forgetful. He claims that 50 percent of the materials heard in a lecture are forgotten within a few minutes, and he cautions students to disregard teachers who tell them to listen and not bother to take notes. He emphasizes the importance of writing the lecturer's ideas on paper in any form that enables the students to later restructure these ideas and their supporting details.

Schilling (1984) in a discussion of how he teaches the skill of notetaking to his intermediate grade level students recommends that notetaking be specifically taught to students before they enter the seventh grade and that instruction in note taking be directed at helping students pass tests over the material from which
the notes were taken. In other words, the notes the students write down should be answers to possible test questions. In teaching the skill of note taking to sixth graders, Schilling initially requires a specific number of notes per lesson. Later the student writes as many notes as he or she feels are necessary for successful study. To emphasize the importance of taking good notes, Schilling had pretest team contests in which students used only their notes for questions and answers. He reported that the time spent teaching note taking skills paid off in increased academic achievement.

Pauk (1979a) recommends that students take notes in longhand. He says that taking notes in longhand is more efficient than taking them in shorthand or using an electronic tape recorder. Upon completion of the lecture the student who wrote his notes in longhand is ready to begin studying; whereas the student who used shorthand must spend additional time transcribing his notes, and the student who recorded the lecture must listen to it all over again when the main ideas could have been consolidated into a paper which could be read in a few minutes.

The need for a "theory of notetaking" has been stressed by Riley and Dyer (1979, p. 56). They indicate that it is important to alert students to what will be covered in the lecture so that the students will be able
to predict the importance of the concepts in the material to be covered.

**Notetaking Methods**

Numerous methods for notetaking have been proposed (Eidson, 1984). This review focuses on notetaking techniques that appear most promising for use with learning disabled and at-risk students. These methods are: the Notetaking System for Learning (Palmatier, 1973), the great cue column (Pauk, 1978), the 5 W's Notebook Technique (Clary, 1986), graphic organizers (Hawk, McLeod, & Jeane, 1981), visualized notemaking (Stein, 1987), advanced organizers (Ausubel & Robinson, 1969; Darch & Carnine, 1986; Lenz, 1983), structured organizers (Slater, 1985), lecture handouts (Hartley, 1976; Kiewra, 1985b; Klemm, 1976), professionally recorded notes (Kiewra, 1984), and guided notes—including listening guides, study guide sheets and structured work sheets (Castallo, 1976; Heward et al., 1987; Heward, Courson, Narayan, & Kline, 1988; Kline, 1985, 1986; Lovitt, Rudsit, Jenkins, Pious, & Benedetti, 1985, 1986; Pados, 1989; Virgalitte, 1988; Yang, 1988).

**The Notetaking System for Learning (NSL).** Palmatier (1971) used a sample of 135 eleventh graders to compare four notetaking methods: the traditional formal outline procedure, a three-column method, a two-column method, and allowing students to take notes as they wished.
Although he found that no one of these strategies was superior, he developed the Notetaking System for Learning (NSL), a two-column method, to be used with learning disabled students. With NSL, the student draws a vertical line down a sheet of paper, making a column on the left that is about 1/3 of the sheet wide. Labels for the notes are written on the left margin with information about the label recorded on the right. In studying the notes, the left column is used to stimulate test questions while material on the right serves as the answer key (Palmatier, 1973).

The great cue column. While Pauk (1978) agrees with Palmatier (1971) that there is no one best format for notetaking, he discusses a two-column method very similar to NSL. Pauk (1979b) refers to the smaller left hand column, of about 2 1/2 inches in width, as the "Great Cue Column" (p. 406). Pauk points out five reasons as to why the two-column method is an effective notetaking strategy for increasing academic achievement. First, in the wider column, the students are actively involved in listening and in making written responses as they record the lecturer's ideas. Second, the students review the lecture to fill in any missing information or illegible words. This slows the rate of forgetting. Third, as the students summarize phrases and key words, they have to think about the lecturer's ideas as they put them into
their own words. Fourth, when the students cover the wider column and state the ideas, they are helping to transfer the lecture to their long-term memory. Finally, the notes are available to be studied. It is these steps of "recording, reducing, reciting, reviewing, and reflecting" that lead to success (Pauk, 1978, p. 97).

The 5 W's Notebook Technique. Clary (1986) suggests a structured approach to notetaking for LD students called the 5 W's Notebook Technique. The student reviews a topic and writes an answer to the questions of Who, What, When, Where, and Why as he reviews the topic. Clary recommends this method of notetaking in subjects like history because it gives the LD student a good overview of detailed material and answering the five questions for each topic is good preparation for a test.

Graphic organizers. Hawk (1986) notes that educators are constantly searching for effective, inexpensive techniques for increasing academic achievement. She suggests the use of graphic organizers as an effective intervention for increasing student achievement that is also inexpensive, requiring only pencil, paper, and instructor time. Graphic organizers are a pictorial, visual, or graphic organization of the material presented by the classroom teacher. A typical graphic organizer used by Hawk in teaching a lesson on protoplasm has a large picture of a cell with its
nucleus. Beneath the cell are pictures of a fish, a candy bar, a can, and another cell. The students writes his or her notes on the pictures (e.g., on the fish is written "Protein" with the term "amino acid" in parentheses, below the fish is written the term "builds protoplasm"). The use of graphic organizers is a strategy that enables the teacher to give written and graphic organization to the subject matter being taught. Hawk, McLeod, and Jeane (1981) reported that when they used graphic organizers with students studying science at the junior and senior high school level, student achievement increased significantly.

In a further study involving 455 above average sixth and seventh graders enrolled in life science classes, Hawk (1986) found the results again supported the use of graphic organizers to improve student achievement. Graphic organizers were used with seven classes made up of 213 students. Graphic organizers were used throughout the lessons covering the first seven chapters of the text in a life science class. A control group of 177 students in eight classes studied the same seven chapters without using graphic organizers. The adjusted mean difference on a 50-item science test between pretest and posttest scores for the group using the graphic organizers was 21.38, while the adjusted mean for the group without the graphic organizers was 12.07. Hawk lists several reasons
why she believes graphic organizers aid learning: graphic organizers provide an overview of the material to be learned, they cue the student about what to look for as they read or listen, and they provide succinct, informative material to review for quizzes.

**Visualized notemaking.** Visualized notemaking, a technique very similar to graphic organizers has been recommended as a way of helping students improve academic achievement (Stein, 1987). With this method, students write the facts to be learned along a "T" line which lists the person, date, and event along the top of the T. Dates are written down the stem of the "T" with persons on the left and the event they are associated with written on the right. He states that when students use both verbal and visual cues they are using their entire brain, not just one side of it. Stein, however, offers no empirical data supporting the effectiveness of visualized notemaking.

**Advanced organizers.** Advanced organizers, when appropriately used, can be an efficient way for learning disabled students to organize information (Lenz, 1983). Ausubel first introduced the concept of advanced organizers (Ausubel & Robinson, 1969). These are activities that a teacher uses to introduce students to a learning task. Advanced organizers include such components as topics and subtopics, background
information relating to the task, the concepts to be learned, examples of these concepts, the sequence in which the information will be presented, special vocabulary relating to the topic, and goals of the learning task (Lenz, 1983). Lenz noted that for advanced organizers to be an effective technique for increasing academic achievement of the learning disabled adolescent, the LD student must be specifically trained in their use. Advanced organizers are presented in advance of the lesson and are used to introduce the learner to the lesson. When using advanced organizers, the teacher begins with an overview of the lesson, states the main topic, and reminds the student to take notes. The teacher presents an outline and a list of the lesson's content. The students are given a worksheet with headings that help them organize their notes.

In an effort to help learning disabled students increase the recognition and recall of facts and details, main ideas, comparison, and cause and effect relationships in courses such as science and social studies, Darch and Carnine (1986) used advanced organizers. Twenty-four LD students in grades 4-6 participated in the study with 12 students being assigned to the visual display group and 12 assigned to a group taught from a textbook only. A visual spatial display of the material to be taught was presented to the students
in the visual display group. The teacher using the visual display method used an overhead projector and taught from a script. The advanced organizers used by the teacher allowed her to highlight the most critical concepts in each instructional unit. In the visual display method, much irrelevant detail was omitted and key facts were emphasized. For instance, when the students were studying vegetation, the overhead transparency had the term and then the information that vegetation changes as you go up the mountain. Below the writing was a picture of a mountain divided into segments with notations on each segment (e.g., in the top segment "snow"; the segment below "no trees, just meadows"; below that, "smaller trees"; and so forth down the mountain). This format enabled the students to see the relationship of various concepts in the unit of instruction. While this visual display was the primary source of information, the teacher's lecture expanded on the visual display. By highlighting the important concepts in each unit, students would be able to take notes that focused on the main ideas. Learning disabled students taught by the visual display method of advanced organizers outperformed students taught by a text method on each of the three 5-item multiple choice probe tests administered. On the 9-item post-test, the mean score for students in the visual display group was 86% as
compared with a group mean of 56% for students taught by the text method.

**Structural organizers.** The structural organizers proposed by Slater (1985) are a type of advanced organizer which focuses on passage organization, not on "semantic content" (p. 713). Slater emphasizes that by understanding the author's organization, the student has clues to remember much more of what he or she reads, will be able to recall more of the major ideas read, and will retain this information for a longer period of time. The structural organizers used by Slater are an outline grid in which the student writes in the main ideas with supporting statements. If the students were studying air pollution, on their structural organization sheet in the blank by the word "Problem", they would write "Air pollution from factories". In the blank spaces for supporting information, the student would write details about air pollution from factories in one space and details about air pollution from cars in another space.

In a study involving 224 ninth grade students of American History, Slater found that students who used the structural organizer outline grid recalled 77% more idea units than students who merely read the text. An idea unit was defined as a context word, a semantic role relationship, or a rhetorical relationship.
Lecture handouts. In the category of completed notes are lecture handouts, prepared by the instructor, which can vary from skeletal to complete in their detail (Hartley, 1976). Kiewra (1985b) suggests that one reason notetaking may appear ineffective is that students often take incomplete notes. He points out that although students may take notes of questionable value, there is evidence that reviewing notes produces higher academic achievement than not reviewing notes (Kiewra, 1985a).

In a study measuring the effects of supplying students with a prepared set of instructor's notes to study rather than have the students take their own notes, Kiewra (1985b) concluded that the 23 students involved learned more factual information when they reviewed detailed and organized instructor's notes than when they studied their own notes. Kiewra (1985a) does suggest that students be encouraged to take notes that stress the main ideas of the lecture and urges teachers to slow the pace of their lectures so that students have time for notetaking. He also suggests that teachers provide cues for when notes should be taken and that important information be written on the board.

In an investigation of the effects of handouts upon students' learning and note-taking, Hartley (1976) found students without handouts took twice as many notes as did students who were given handouts. However the students
with the handouts did significantly better on a test of factual recall items. Hartley then designed a series of studies in which he varied the amount of writing that students were asked to add to the lecture outlines. Generally, he found that handouts aided recall if students were required to fill in missing words. Hartley concluded that more work is needed if one is to be able to offer guidelines on the design of lecture handouts.

Klemm (1976) studied the use of skeleton notes with university students. The skeleton notes designed by Klemm covered about half a notebook page. The notes contained the key terms of the lecture in outline form. These skeleton notes gave the students the main ideas and subtopics in a form on which they could rephrase and supply the missing information as the professor delivered the lecture. Klemm found that the skeleton notes allowed the students to actively interact with the lecture material. On a 50 minute short-answer and multiple choice test over the lecture material, students who completed skeleton notes had a mean score of 82 as compared with a mean score of 80 for students who took their own notes. When Klemm gave a 33-item unannounced test over the same material one week later, students who had completed the skeleton notes had a mean score of 76 as compared with a mean score of 66 for the students who took their own notes.
**Professionally recorded notes.** Professionally recorded notes are notes from professional notetaking services. Kiewra (1984) points out that while the efficacy of professionally recorded notes has not been studied formally, related research suggests that these professionally derived notes can be beneficial if properly used. Kiewra lists several reasons why professionally generated notes may be beneficial. First, they can be helpful when the material in class is being presented so rapidly that notetaking can actually be a hinderance. Second, they can be of value when the student is physically incapacitated or has low academic ability. Finally, they can be beneficial for notetakers who take incomplete notes.

**Guided Notes**

Heward et al. (1988) describe guided notes as a handout that "guides" the student through the material to be covered by the teacher. Guided notes provide the format on which the student writes in key facts, concepts, and relationships. This format includes basic information and gives the student cues for writing in the necessary facts. The students then have a guide to follow during the lecture as they fill in the missing information. Guided notes provide students with many opportunities to make written responses during lectures. Guided notes also give all students the same set of facts that can be
studied in preparation for quizzes. Lazarus (1988) suggests that before initial use of guided notes, a student training session should take place. In this session the student should be told the value of taking guided notes, how to use the notes in following the lecture, how to make the notes more personal, and the importance of reviewing the guided notes once they are completed.

Using guided notes with learning disabled high school students. Guided notes were used in three studies with high school learning disabled students (Heward, Courson, Narayan, & Kline, 1987; Kline, 1985, 1986). Each of the studies found that the use of guided notes raised daily quiz scores, facilitated learning, increased recall, and produced more active student response.

In a pilot study, Kline (1985) found the use of guided notes raised the daily quiz scores of all eight learning disabled high school students in her social studies class. Kline’s (1986) second study of guided notes used the same eight LD students plus two other LD students in a last period American History class. The baseline condition, in the ABAB reversal design used in this study, consisted of students taking their own notes during the lecture. Guided notes were used in the intervention phases. On the 10-item quiz given each day following the lecture, the class mean scores during the
baseline phases were 6.2 and 6.8 as compared to class mean scores of 9.2 and 9.1 during the guided notes phases.

In the third study (Heward et al., 1987), using 11 students which included nine students from the second study, researchers compared the effects of guided notes to teacher-completed notes. These LD students were enrolled in a United States Government class. The teacher read four pages from the text then presented the material using a projected lecture outline. In the baseline condition, students took their own notes. In the intervention phase of this alternating treatments design, the students were given either guided notes or a set of notes completed by the teacher in which she had printed in the information that the student would normally write in. Students were given 3 minutes to study before taking the 10-item quiz which was made up of five short answer (recall) questions and five multiple-choice (recognition) questions.

Results showed increased quiz scores when guided notes were used. In baseline where students took their own notes, the class mean was 5.8 correct responses. In the intervention phase, the class mean was 8.0 for teacher-completed notes and 8.2 for student-completed guided notes. Three of the students showed no difference in scores between guided notes and teacher-completed notes. Three students scored slightly better with teacher-completed notes and five students scored somewhat
better with the student-completed guided notes. Since nine of the 11 students had a recent history of earning good quiz scores as a result of using guided notes in the past studies, they possibly attended more carefully to what was written on the teacher-completed notes. These data do not provide evidence that having students actively respond in the completion of guided notes is not an important variable.

Using guided notes in a middle-school classroom. Yang (1988) conducted a study using guided notes in a sixth-grade middle school class which was studying oceanography. This regular science class contained 20 students, four of which were students with learning disabilities mainstreamed for science. In her ABAB reversal design study, Yang found the use of guided notes produced higher scores on 10-item quizzes (five short answer and five multiple-choice questions) taken the day after the lecture when compared to the baseline conditions in which the students took their own notes. During the second baseline and second intervention phases, the resource room teacher spent 10 minutes each day reviewing the notes that the LD students brought to the resource room. Quiz scores for the LD students greatly increased in the second intervention phase. In both of the baseline phases, all LD students earned failing grades. During the second intervention phase, one of the LD students
increased his grade to a B-, another LD student earned a C, and one LD student earned a D-. The remaining two LD students, although they had higher average scores were still failing.

For the non-LD students, in both baseline phases there were no A's and 11 failures. There was one B in the first baseline phase and two B's in the second baseline phase. During the second guided notes phase, there were six A's, five B's, and only one failure.

Using guided notes with mildly handicapped juvenile delinquents. Virgalitte (1988) used guided notes to teach employment applications to mildly handicapped juvenile delinquents. She used a reversal design in which students took notes on their own during baseline phases and completed pre-made notes along with the lecturer during the intervention phases. Results for the nine students involved in the study showed that on daily 10-point quizzes and on unit/post tests, the scores for all students improved during the guided notes conditions. The average score was 6.3 during the lecture-take notes condition as compared with 8.8 when the students used guided notes. This increase of 25% in the improvement of recall information is similar to the results of Kline (1986) who found a 23% increase in quiz scores when guided notes were used. Virgalitte also noted that lower achieving students made the greatest academic gains. The
four lowest achieving students made gains of 37% from Baseline 2 to Guided Notes 2. She noted that while all students took notes during the guided notes phases, students were inconsistent in notetaking during baseline conditions.

In a generalization check using three non-trained application forms, the average for the students was 94% of all information asked for on the employment applications was filled in correctly. No scores on generality checks were below 81% indicating that the skills generalized to non-trained employment applications.

Using guided notes in elementary school. Pados (1989) used guided notes with 20 fifth graders in a social studies class, two of whom were mainstreamed LD students, two had been students in the LD program previously, and seven were academically gifted students. This reversal design study, like the Yang (1988) experiment, introduced review of guided notes for the LD students by the resource room teacher during the second baseline phase. Pados found that as a group, the students accurately recorded 96% of all concepts/facts presented during the guided notes phases as compared with only 34% of the concepts/facts being accurately recorded when students took their own notes. Pados reported that guided notes produced superior quiz scores on a 10-item test given the day after the lecture for 17 of the 20 students.
Listening guide. A science teacher and a reading specialist worked together to create a listening guide to help students take notes on science lectures (Castallo, 1976). Students were given an outline of the science lecture so that they could easily write what they heard in the lecture on blank spaces of the listening guide. The teacher used transparencies of the lecture outline and filled in the transparency along with the students so that there would be no possible misunderstandings. A similar listening guide format was used by the social studies teacher for lectures. Although he offered no empirical data, Castallo stated that listening guides helped students focus on the words that were most important.

Framed outlines. Lovitt et al. (1985) used two methods to adapt science materials for LD and regular seventh graders. They compared Precision Teaching (PT), in which specially designed see-to-say and see-to-write practice sheets were used, with Study Guide (SG) sheets, which they termed "framed outlines". The PT approach featured the words and definitions in each chapter that were considered important by the teacher. The see-to-write Precision Teaching practice sheet was a fill-in-the-blank, short answer format on which the student practiced writing answers based on material adapted from the science text.
In the Study Guide approach, the teacher lectured using transparencies of the worksheets. These "framed outlines" were made up of the chapter's main ideas with key words left blank. The students filled in the blanks as the lecture progressed.

Both treatments were found to be effective with students of all achievement levels. Both approaches required students to actively respond by repeatedly practicing basic words and definitions. Students who received either the PT or SG treatment did better than students taught by other methods. The worksheets used by Lovitt et al. (1985) were similar to the guided notes described by Heward et al. (1988).

Structured worksheets. Structured worksheets are very similar to guided notes and can be considered a category of guided notes. Structured worksheets contain a series of problems or items that the students work as the teacher provides an explanation of the procedures necessary for the completion of the items or problems. Each structured worksheet focuses on a very small part of the overall solution. Students actively respond on these structured worksheets, each worksheet building on the previous one until the student can successfully solve the entire problem, such as dividing a six digit number by a three digit number.
Heward, Cooke and Terr (1987) give an example of a structured worksheet to teach the first step in solving a long division problem. At the top of a sheet of paper would be a box enclosing a division problem. The divisor, dividend, and quotient are labeled. Under the boxed example problem is a rule (e.g., If the first digit of the dividend is equal to or larger than the divisor, begin solving the problem by dividing into the first digit). Below the rule would be several problems. The teacher would go over the rule with the students, then the class would work the problems together by identifying the first digit in the dividend, drawing a circle around it, and stating if the dividend is equal to or larger than the divisor. After several problems, another rule of what to do when the first digit of the dividend is smaller than the divisor would be discussed and the class would identify and circle the digits that would be divided into. After drawing circles around the digits to be divided into on several problems as a group, students would circle the digits for the remaining problems on their own. On this structured worksheet, the student is identifying the digits to be divided into. A later worksheet would involve the actual working of the problem.

An important aspect of the structured worksheet is that there is an example, a rule, some problems to be worked as a group, and then some problems for the student
to work on his own. The parts of a problem are broken down into small steps which are learned one step at a time (Heward, Cooke, & Test, 1987).

Summary of the Review of Literature

This review of the literature described characteristics of students with learning disabilities, such as academic, cognitive, and social skill deficits, deficiencies in study skills and/or learning strategies, and motivational problems. A review of the demographic, family-related, peer-related, school-related, economic, and individual factors associated with at-risk students was presented. Both learning disabled and at-risk adolescents were found to be performing below their expected achievement level academically.

Research indicates that there are effective strategies for increasing the academic achievement of these underachieving learning disabled and at-risk students. The use of rapid paced presentation by the teacher, choral responding, the use of response cards, timed trials and feedback, and peer tutoring are all techniques that, when used by the classroom teacher, are effective for both normal and mildly handicapped youngsters. These strategies provide the student with increased opportunity to make active responses to academic stimuli.
Another method of providing the student with opportunity to make active academic responses during group lecture situations is to encourage the student to take notes. This review of the literature indicates there are effective strategies for notetaking, a skill needed for academic success on the secondary level.

Guided notes is a method of notetaking that has been shown to increase academic achievement when measured by daily quiz scores. Guided notes have been used in content area subjects, such as science and social studies, with classes on levels from the elementary school through high school. Classes investigated have ranged from those which contained academically gifted students and mainstreamed LD students to resource room classes of only LD students and classes for juvenile delinquents. In each study, guided notes were found to produce increased scores on quizzes over the material presented when compared to conditions in which students took their own notes.
CHAPTER III

METHOD

This chapter describes the subjects, setting, procedures, and the experimental design used in the study. The dependent variables are defined and their measurement is discussed. Also included is a list and description of the materials used in conducting the study.

Subjects and Setting

The subjects were eight girls and 11 boys enrolled a last period seventh grade skills development social studies class in a large suburban public middle school. One student was hispanic, all others were caucasian. Of the 19 students in the class, nine were identified as learning disabled students and were mainstreamed into the social studies class. Of these, five students received special instruction for part of each day in the school’s SLD resource room and four students received daily tutoring from an SLD tutor. The remaining 10 students were low functioning students who, while not qualifying for special education placement, were judged by the school as academically at-risk given their standardized tests scores,
overall grade point average, and general response to the expectations of the school. All of the at-risk students had shown difficulty in abstract learning and were slow in completing the requirements for their assigned courses. Parental permission had been given for each of the at-risk students to participate in skills development classes. Students were assigned to the skills development classes at the beginning of the current school year and had been in these classes for approximately 2 1/2 months when the study began. See Table 1 for information on the subjects' age, sex, placement, and test scores.

The social studies class met daily during the ninth, and last, period of the school day, from 2:45 p.m. to 3:30 p.m. The classroom was equipped with an overhead projector and a wall-mounted screen. Students' desks were arranged in six rows with each student's desk providing an unobstructed view of the screen. A study of the continent of Africa was the general topic covered by the social studies class during the time of this research. However, because the study started just before the 1988 presidential election and because students were working on individual projects for the school History Fair held in December, some of the early lessons covered the election and how to write the bibliography for a History Fair report. The lessons during the study's final week were on the state of Ohio.
Table 1

Student Information.

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<th>ERB Score° Apt.</th>
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<td>2</td>
<td>F</td>
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Notes. a = Students are numbered in alphabetical order.
b = Grade point for 1988 is the grade point average (GPA) for the 1987-88 school year. Grade point for 1989 is the GPA for the first semester of 1989. GPA is on a 4-point scale (4.0 = A, 3.0 = B, etc.) C = IQ not available for at-risk students. WISC-R administered to resource and tutored students within the past 3 years. Full scale IQ reported. d = ERB is the Educational Records Bureau test. Total aptitude and reading comprehension scores are reported as percentile scores for this school. e (dash) = no test scores available.
Experimenter

The experimenter was a third-year doctoral student majoring in special education with an emphasis in applied behavior analysis. The experimenter had 4 years experience as an elementary school classroom teacher, 3 years experience as a resource room teacher for educable mentally handicapped and learning disabled students, and 10 years experience as a teacher of severe behaviorally/emotionally handicapped students.

Teacher

The teacher had a Ph.D. in Educational Development and 24 years teaching experience ranging from kindergarten through the university level. Most of her teaching experience was at the elementary level teaching sixth grade science and history. She had held her present position of seventh and eighth grade social studies and reading teacher for the past 5 years. She was Chairman of the Social Studies Department in the school and served on the district K-12 Curriculum Committee. She also represented her middle-school on the district Committee for Students Not Reaching Their Potential. This was her first experience teaching a skills development class of at-risk and learning disabled students.

Definition and Measurement of Dependent Variables

Five dependent variables were measured in this study. These variables were (1) each student's score on daily
social studies quizzes, (2) each student's score on bi-weekly social studies tests, (3) the percentage of lecture concepts/facts accurately recorded by students in their own notes and in completing the guided notes, (4) the amount of time spend by the experimenter in preparing short- and long-form guided notes, and (5) students' preferences and opinions of the three notetaking methods.

**Daily quiz scores.** The primary dependent variable was the daily 10-point quiz. The quiz was administered at the beginning of the social studies class period on the school day following each lecture. The quiz covered facts and concepts from the previous session's lecture. Each quiz consisted of five recall questions (fill-in-the-blank/short answer) and five recognition questions (multiple choice with four choices). See Appendix E for an example of the daily quiz. After school, the experimenter scored each item on the quiz as correct or incorrect according to an answer key previously prepared for that quiz. In scoring the multiple-choice items, if a student circled more than one answer, the question was scored as incorrect. If a student had circled more than one answer but had marked through all of the other circles so that only the correct answer remained circled, this question was scored as correct. A correct response to a recall question was scored even if the word was spelled incorrectly if any of the following errors were made: the spelling error did
not produce another incorrect response, reversal of two letters, omission of a letter, addition of an extra letter, or substitution of a letter. Responses were also scored as correct if the word was spelled phonetically. Each correct answer added one point to the student’s score for a maximum of 10 points on the daily quiz.

**Bi-weekly tests.** At the end of each 2-week period a 30-question test was administered. This test included 10 questions over the lecture material presented the previous day which was counted as the daily quiz. The remaining 20 questions, with at least one recall question (fill-in-the-blank/short answer) and one recognition question (multiple choice), were taken from each lecture covered during the just completed 2-week period. These items were the bi-weekly test designed to assess students’ maintenance of the content covered during the lectures of the previous two weeks.

The bi-weekly tests were administered in the same manner as the daily quizzes except for time limits. The review period was 5 minutes and more time was allowed for the administration of the test. As with the daily quizzes, the experimenter scored the bi-weekly tests with an answer key that indicated correct and incorrect student responses. Criteria for a correct response was the same as that used for scoring the daily quizzes. Each correct
answer added one point to the student’s score for a maximum of 20 points on the bi-weekly test.

Lecture concepts/facts recorded. The percentage of concepts/facts from the teacher’s lecture correctly recorded by students on their own notes was measured during the two phases when they took their own notes. Each concept/fact from the teacher’s daily lecture was numbered. The experimenter compared each student’s own notes with the list of concepts/facts and placed a check by each concept/fact correctly recorded by the student. The checks were then added. The sum of the checks was divided by the total number of concepts/facts in the lecture to yield a percentage of concepts/facts correctly recorded by the student. For example, if the teacher presented 12 concepts/facts in the lecture and the student recorded 10 of these, the student would have recorded 83% of the lecture concepts/facts.

For a concept/fact to be checked as correctly recorded, the student must have written, as a minimum, the key word for the concept/fact and made no incorrect statement about that concept/fact. The following spelling errors did not cause a concept/fact to be scored as incorrect: the spelling error did not produce another incorrect response, reversal of two letters, omission of a letter, addition of an extra letter, or substitution of a letter. The key word for the concept/fact could be spelled
phonetically and the concept/fact would be scored as correct. Appendix N is a checklist for student notes.

Each student's guided notes were also checked by the experimenter for the percentage of lecture concepts/facts correctly recorded. A response was considered incorrect if no response was written in or if an incorrect response was entered on the guided notes form. A response did not have to be spelled accurately to be considered correct. The same criteria was used for spelling on guided notes as was used for spelling when students took their own notes.

Preparation time for guided notes. In order to determine the amount of time involved in the preparation of both the short- and the long-form guided notes, the experimenter started a stop-watch when she began writing the guided notes. If an interruption occurred, the watch was stopped and restarted when work on the guided notes was again undertaken. A separate time was recorded for the time taken to write the notes and the time to type and print the notes once they were written. Both the writing time and the typing time were recorded for a total preparation time.

Students' preferences and opinions. Students' preferences and opinions, as an assessment of social validity, were obtained from student responses on an exit questionnaire form administered following the last phase of the study. This form, in Appendix I, was administered to
the students following the conclusion of the study. The results of the exit questionnaires were compiled and reported by the experimenter. A daily log of student comments was kept throughout the study and comments relevant to the three notetaking methods were reported.

Reliability of Data

One day each week was randomly selected for an interobserver agreement check on daily quiz scores. Each student's unmarked daily quiz paper for the selected day was independently scored by a second observer. In scoring the daily quizzes, the experimenter placed a small black pen mark on the extreme left edge of the paper to indicate the questions that were answered incorrectly. The score was then recorded on a separate sheet of paper and one-half inch of the left side of the quiz paper was folded back so the second observer could not see how the experimenter had scored the questions. The papers were then given to the observer who placed a slash mark through the number of any questions answered incorrectly and the total number of correct answers was written in the blank for the score in the top right corner of the quiz paper. After the second observer had scored the papers, the experimenter unfolded each and compared the scoring. An interval-by-interval method was used for determining agreements and disagreements between the experimenter and the second observer (Hawkins & Dotson, 1975). The percentage of
interobserver agreement was calculated by totaling the number of agreements divided by the total agreements plus disagreements multiplied by 100.

\[
\text{Agreements} \quad \frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100 = \% \text{ of Agreement}
\]

All of the bi-weekly tests were checked for accuracy of scoring. The same procedure was followed as was used in the scoring of daily quizzes. Interobserver agreement on bi-weekly test scores was calculated by using the same formula used when calculating agreement on daily quiz scores.

Materials

Parental consent form. A consent form signed by a parent or guardian was obtained for each student who took part in the study. All students in the class returned signed permission slips and participated in the study. Attached to the consent form was a letter from the school telling more about the study. See Appendix A for the consent form and letter.

Textbooks. The textbooks used in this study were *A World View* (Pratton, Rengert, Saveland, Cooper, & Caro, 1985) and *Ohio's Heritage* (Burke & Davison, 1984). In addition to the lectures from the textbook, some of the lectures were from filmstrips on Africa while others were from packets of student handouts found in *Lessons on Africa* (Shedlock, 1981). Material for lectures on the
presidential election came from handouts prepared by the teacher. Lectures on preparation for the History Fair were prepared from the handout of instructions for History Fair projects prepared by the social studies staff at the middle school. The lesson to celebrate Martin Luther King Jr.'s birthday was based on an interview with the school custodian who is black.

Each Friday, instead of having a teacher lecture, the class viewed and took notes on a 20-minute television program called "News Depth". News Depth is produced for public schools in Ohio and is broadcast on the Public Broadcasting Channel. This program covers the major state and national news events of the week.

Lecture outlines. The experimenter, with input from the social studies teacher, prepared an outline of each lecture. Each lecture outline contained from 12-14 concepts/facts to be presented in the lecture. These concepts/facts were selected by the teacher. Appendix B contains a sample of a typical lecture outline.

Instructional transparencies. The experimenter and the teacher viewed the television program "News Depth" to identify 12-14 main ideas from the program that could listed for making the instructional transparencies that were used by the teacher as a review after the students had watched the program. Two or three overhead transparencies were made to accompany the lecture outline
for each instructional session. The lecture outline was printed in standard size type with double spacing, then enlarged 155% so that transparencies could be easily seen when projected. These transparencies were used by the social studies teacher in the presentation of the daily lecture. The teacher progressively disclosed each new concept/fact on the overhead projector as it was discussed in the lecture. See Appendix B.

**Overhead projector and screen.** An overhead projector was used during each lecture to display the lecture outline on the screen located in the front of the classroom.

**Water soluble marking pens.** Flair brand water soluble marking pens in black, purple, red, blue, and green were used by the social studies teacher to highlight important points on the instructional transparencies and by the experimenter for recording scores on the public posting charts.

**Long-form guided notes.** This is a format for guided notes on which the student in completing the guided notes outline writes, in sentences or phrases, the key concepts/ideas from the lecture. Asterisks (*) were used to cue students where to write the information. See Appendix C for an example of long-form guided notes.

**Short-form guided notes.** This is a format for guided notes on which the student fills in blanks with one word
or short phrases. See Appendix D for an example of short-form guided notes. Both forms of the guided notes were three-hole punched to fit into the notebooks used by students during the study.

Notebooks. A red three-ring notebook with an Ohio State University logo was provided for each student. All of the social studies notes that students took on their own as well as all of the guided notes they completed were to be kept in the notebooks.

Daily quizzes. A 10-item quiz was prepared by the experimenter to go with each lecture. Each quiz was made up of five recognition questions (multiple choice with four choices) and five recall questions (short answer/fill-in-the-blank). The quizzes were duplicated by the experimenter and were administered by her following a 3-minute study period at the beginning of each class session. Appendix E is a sample of a typical daily quiz.

Bi-weekly tests. A 30-item bi-weekly test was prepared by the experimenter. The first 10 items on the test covered material presented in the previous day’s lecture and were scored as a daily quiz. The remaining 20 items covered concepts/facts presented over a two week period. Each bi-weekly test contained at least one recognition question (multiple choice) and at least one recall question (short answer/fill-in-the-blank) from each lecture covered during the two week period prior to the
test. The questions used on the bi-weekly test were randomly determined by drawing a number from 1-5 from a box to determine which multiple choice and which short answer question would be used from each daily quiz. If more than two questions needed to come from a quiz, numbers of the quizzes were placed in a box and drawn to determine which quizzes would have more than two questions taken from them. The number of the questions from these quizzes was determined by the same method of drawing a number from the box of numbers 1-5. See Appendix F for an example of a bi-weekly test.

Quiz and test answer keys. An answer key for each daily quiz and bi-weekly test was developed by the experimenter. The answer keys listed the answers for each question that would be accepted as correct. In the case of fill-in-the-blank/short answer questions for which more than one answer would be acceptable, each answer that would be considered correct was listed. Appendix G contains an example of an answer key for one daily quiz and one bi-weekly test.

Public posting chart. Two 22" x 28" posterboard charts were made by the experimenter and displayed in the front of the classroom. The charts were used for posting each student’s quiz scores. Each student was assigned a number and his or her scores were posted next to that number. The charts were covered with clear contact paper
so that scores could be posted with a water soluble marker. On the daily quiz score chart, daily scores were erased and new scores posted each week. The chart included a space for each student's highest daily quiz score and the highest weekly total of quiz scores. The second chart was used for posting each student's bi-weekly test scores and included a space for the highest bi-weekly test score. Since only five bi-weekly tests were administered during the study, this chart was not covered with clear contact paper and all posted scores were written directly on the chart. See Appendix H for drawings of the public posting charts.

Exit questionnaire form. A form on which students rank ordered their preferences for methods of notetaking--student's own notes, long-form guided notes, or short-form guided notes--was duplicated by the experimenter and distributed to the students at the end of the study. See Appendix I for copies of the exit questionnaire form.

Data collection sheets. A procedural observation form was completed by the experimenter at each session to determine if the sessions were conducted as specified. This observation form is shown in Appendix K.

A form for recording the amount of time required by the experimenter to prepare and type the guided notes is shown in Appendix M.
Subject Matter and Curriculum Design

The subject matter of the social studies class was to be a study of the continent of Africa. At the beginning of the study, there were several lectures on the election and on how to write a bibliography for History Fair projects. One session was a question and answer session with a guest speaker, and the final week's sessions were about Ohio. Each Friday throughout the study, the students watched the television program, "News Depth". Lessons were planned with the social studies teacher who decided in what order the lessons would be taught. The experimenter prepared all lecture outlines and the transparencies of the 12-14 concepts/facts to be taught. The content was presented to the class as a group by the social studies teacher who taught the lesson. Students took notes of their own or filled in information on guided notes, depending on the condition in effect, as the teacher talked. Afterwards, the lecture outline was projected onto a screen in the front of the classroom and the teacher used it to summarize the lesson's key concepts/facts. The teacher used colored markers to underline key words and phrases on the transparency as she progressively disclosed each concept/fact. Each concept/fact was again discussed as the students listened,
asked and responded to questions, while checking either their own notes or guided notes which had been prepared by the experimenter. Missing information could be added and incorrect information changed during this summary time. The teacher was given copies of all experimenter-prepared materials for approval so that they could be revised if necessary before being taught.

Experimental Design

The experimental design incorporated both reversal and alternating treatments design components. An ABAB reversal component was used to compare the effects on daily quiz and bi-weekly test performance of using short- and long-form guided notes compared to baseline phases in which students took on their own notes. During the guided notes phases, the short- and long-form guided notes formats were randomly alternated across sessions by a coin toss. This alternating treatments component of the design provided a comparison of any differential effects of the two guided notes formats.

Procedure

General procedures. The social studies teacher set up the overhead projector prior to the students entering the classroom. The experimenter had the instructional transparencies prepared, in order, and ready to be used. On sessions in which guided notes were used, the experimenter had the notes prepared, duplicated, and
hole-punched so that they were available to be given to
the students at the beginning of the lecture.

Before the students entered the classroom, the
experimenter had posted the quiz scores from the previous
session and placed on each student’s desk the social
studies notebook, the guided notes (if they were used),
and the graded quiz from the previous day.

After the students were seated and attendance and
announcements were taken care of, the teacher turned the
class over to the experimenter who called the students’
attention to the quiz score chart. The experimenter gave
positive, differential feedback to the class and mentioned
the number of individuals who had made improvement in
their quiz scores. A typical feedback statement included:
"Class, look at your score! Your class total was 132
points. That’s four points more than yesterday’s score!
Good work! Keep it up!", "Eight of you made 10’s! That’s
almost half the class with perfect papers! That’s
fantastic!" "Student 4, you got twice as many correct
today as you got yesterday! Way to go!" The same type of
encouraging feedback was given each session throughout the
study regardless of the experimental phase. Written
feedback was also provided to students. Positive feedback
statements were written directly on the quiz paper; but
more often the feedback was written on a self-stick
removable note that the student could remove and keep. If
a student had done poorly on a quiz when he or she took their own notes, the feedback would be something like, 
"Really listen and take good notes today, (name), then you’ll have what you need to study tomorrow. I’ll bet you can beat your score tomorrow! I’m pulling for you!" If the student had a perfect paper, typical feedback was, "Wow, (name) am I ever impressed! That’s two 10’s in a row!!! Study your notes today. I’ll bet you can make it four in a row!" Students received the same type of encouraging written feedback regardless of phase or condition.

After providing oral feedback on quiz scores, the experimenter told the students they had 3 minutes to study their notes before taking the daily quiz over the prior session’s lecture. The experimenter told the students to open their notebooks, said "Start.", and pressed the stopwatch to begin timing the study session.

After 3 minutes, students were told by the experimenter to put away their notebooks in preparation for the quiz. The quiz papers were quickly distributed and students started taking the quiz. When a student completed the quiz, he or she took it and the quiz from the previous session to the front of the room. That day’s quiz was placed in a white tray while the quiz from the previous day was placed on the teacher’s desk in a stack beside the tray. The student then returned to his or her
desk. Since all students finished at about the same time, after the first few sessions, the teacher did not give an assignment to work on while waiting for others to complete the quiz. There were no time limits for the quiz. Students were allowed to work until they had completed it. Daily quizzes were completed in 3-4 minutes.

When the quiz was completed, the teacher introduced the lesson. She often used maps of Africa as she told the students the main points of the lesson. During the lecture, students were sometimes called upon to answer questions and were allowed to ask questions. If the textbook was being used, students could volunteer to read paragraphs from the text. After the teacher had covered all of the main points of the lesson, she turned on the overhead projector and progressively disclosed each concept/fact as she reviewed it. The experimenter checked off items on the procedural observation form to see that the teacher was following the correct instructional procedures.

The lecture continued until the announcements for the end of the day came over the PA system. Following the announcements, the students were dismissed. Total lecture time, including the review of the concepts/facts on the overhead projector ranged from 20-30 minutes per session. After the students left, the teacher, the experimenter,
and sometimes the SLD resource room teacher, had a conference to discuss the day’s lesson and to go over plans for the next day. The quizzes were then scored by the experimenter and the scores posted on the public posting chart. This chart was near the door and students looked at their scores as they entered the classroom.

Because students watched the News Depth program each Friday, the 30-item bi-weekly tests were administered on the Monday following the second Friday. On the bi-weekly exam, 10 of the questions covered material from the previous day’s lecture. This section of the test was scored separately and the results entered as a daily quiz. The remaining 20 questions were over material covered during the two week period. Procedures, except for time limits, were the same as for the administration of the daily quizzes. Students were given 5 minutes to study for the bi-weekly test and were allowed as much time as they needed to complete the test. Because the students were able to complete the bi-weekly test in 8-10 minutes, the teacher was able to give a lecture as usual on the bi-weekly test days. After each bi-weekly test, the experimenter removed all material from the notebook so that students’ notebooks contained only the material needed when they studied for their next bi-weekly test.

Baseline—student takes own notes. On the first day of the study, the teacher told the students that for the
next few months in their social studies class, they would come in, have a "recall" (quiz) over the previous day's lecture, and every second Monday have a bi-weekly recall over the material covered during the previous two weeks. After the recall would come the daily lecture. (The teacher chose to use the term "recall" instead of test or quiz because she did not want the students to think they were having a test each day.) The teacher explained that she would use the overhead projector as she lectured and that the students should take notes on the important concepts/facts from the lecture. She explained that the recall would cover only the concepts/facts included on the lecture transparency.

Each student was given a three-ring notebook for keeping the notes taken in social studies class. The notebook had the student's name on a strip of masking tape on the front and the student's row number for ease in distributing the notebooks each day. When not in use, the notebooks were stored on a bookcase under the windows. The teacher told the students to write their name and the date at the top of the blank page of notebook paper and write the notes for the lesson on that page. She told them that they would have 3 minutes to study before the recall would given and 5 minutes to study before a bi-weekly recall. The type and number of questions on both the daily and bi-weekly recalls were explained.
Students were told that each daily recall would consist of 10 questions. The first five questions would be multiple choice questions with four possible answers. The five remaining questions would be short answer or fill-in-the-blank type questions. The bi-weekly recall would have 30 questions. The first five multiple choice and the first five short answer questions would be over the previous day's lesson and would count as a daily recall. The remaining 20 questions, 10 multiple choice and 10 short answer, would come from the recalls of the previous two weeks, with at least one multiple choice and one short answer question from each recall.

On the first day of the study, the experimenter showed the students the chart on which their recall scores would be posted and each student was given a slip of paper containing a number as scores were posted by student number rather than student name. Names were listed in alphabetical order for the assignment of student numbers. The teacher initially did not want to use the scores as a part of the students' class grades so students were told that the quiz scores would not affect their social studies grade. (The teacher later decided that the scores on quizzes number 19 through 22 would count toward class grades, and she informed the students of this prior to those lectures.) After answering student questions about
the procedure, the teacher conducted the lecture using the lecture outline.

Throughout the phase in which students took their own notes, the social studies teacher followed all of the general procedures outlined in the General Procedures section. The experimenter called the students' attention to the score chart and provided positive, differential feedback. She then gave students 3 minutes to study their notes and administered the daily quiz. The 10-item quiz consisted of five recognition questions (multiple choice) and five recall questions (fill-in-the-blank/short answer). After the quiz, the teacher taught the lesson using the lecture outline projected on the screen as a summary. Students were encouraged by the teacher to take their own notes on important concepts/facts.

Student notebooks contained 10 sheets of blank notebook paper. Each day that students took their own notes, the students were told to write their name and the date at the top of a page of notebook paper and write their notes for that day on that page. Because most students were not writing their names or the date on their paper nor were they writing notes on some of the days, after day 5, the experimenter started handing out paper with the student's name and session number written on it.

Students could check the correctness of their notes using the key concepts/facts on the teacher's lecture
transparency and make changes if desired. Feedback on the students' quiz papers included comments such as, "Listen carefully and take good notes today. With notes to study, I'll bet you'll do better on your recall tomorrow. Good luck!" The initial baseline phase in which students took their own notes continued for nine sessions.

**Guided notes.** In the guided notes phases, students were given guided notes to complete as the teacher delivered the lecture. One form of guided notes, short- or long-form, was duplicated by the experimenter prior to each class session. A coin was tossed to randomly determine the days on which students receive short- or long-form guided notes (heads=short-form; tails=long-form). The same form of guided notes was not used for more than two sessions in a row.

When the guided notes phase began, the experimenter told the students that guided notes had been prepared to help them with their notetaking. The guided notes would identify the important concepts/facts from the lecture. The teacher showed the students a lecture outline and pointed out how the guided notes were numbered to go along with the lecture outline (e.g., "The number 1 refers to the first major point on the lecture outline, and (a) refers to the first subheading under that point.") The experimenter explained that there would be two types of guided notes used in the class. On some days, the
students would receive the long-form of guided notes, while on other days, the guided notes would be on a short-form. The experimenter explained that the long-form of guided notes would require the student to write the concepts/facts in the form of sentences or complete phrases. An asterisk (*) cued students where to write each sentence or phrase. On days when the short-form of guided notes were used, the student would fill in blanks with one word or with short phrases to complete the guided notes. The experimenter reminded the students to try to fill in each space and to fill it in accurately so that they would have complete and correct information to use in studying for the recall the next day.

The teacher told students that if she was going too fast, they could ask her to slow down or to go back over a concept/fact. She encouraged students to look on the screen to get the spelling of important words and reminded them that both forms of guided notes followed the lecture outline that was projected using the overhead projector. Students were told that they would be tested over only the information contained on the lecture outline which should be in their guided notes if they had completed them.

After 13 sessions with guided notes, the intervention of guided notes was withdrawn and students again took their own notes for 7 sessions.
Finally, the intervention condition of guided notes was reintroduced and was continued for 12 sessions. The exact length of each experimental phase depended upon the level and stability of the scores students made on the daily and bi-weekly quizzes. The first baseline was extended to nine sessions because of the variability of the data.
CHAPTER IV
RESULTS

This chapter presents the results of the study. Individual student and group summary data are presented for daily quiz scores, bi-weekly quiz scores, and completeness of notes. A summary of the students' opinion of the three methods of notetaking concludes the chapter.

Procedural Reliability

A procedural reliability checklist was completed by the experimenter for each of the study's 41 sessions. A copy of this procedural reliability form is in Appendix K. The public posting chart was discussed at the beginning of the session for 100% of the sessions when a quiz had been administered in the previous session. Each of the six procedures for administering the daily quiz and/or bi-weekly test was followed for 100% of the sessions during which quizzes or tests were administered. The final procedure of discussing material from the text using the overhead projector and transparencies was followed for 98% of the lecture
sessions. In Session 40, the News Depth program was started late and the teacher did not have time to discuss the transparencies at the end of the session. The transparencies were displayed on the overhead projector during the announcements but were not discussed.

Daily Quiz Scores

Interobserver Agreement

Table 2 shows the percentage of interobserver agreement on daily quiz scores for each individual student by experimental phase. Table 3 shows the percentage of interobserver agreement on quizzes by condition. All students' daily quizzes were checked by a second observer on 11 of the study's 41 sessions. Total interobserver agreement on daily quiz scores for individuals ranged across students from 98-100% with a group mean of 99%.

Student 1

Figure 1 shows Student 1's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 1, a tutored SLD student, was present for 38 of the study's 41 sessions. All three absences were in the final guided notes phase.
Table 2

Percentage of Interobserver Agreement on Daily Quiz Scores by Experimental Phase.

<table>
<thead>
<tr>
<th>Student</th>
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<th>GN 2 (3)</th>
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| Mean    | 99       |
| Range   | 98-100   |

Notes. Numbers in parentheses indicates the number of quizzes scored by second observer during each phase. a = Based on 1 quiz only. b = Based on 2 quizzes. c = Based on 3 quizzes. d = Dash indicates no data for phase.
Table 3
Percentage of Interobserver Agreement on Daily Quiz Scores by Condition.

<table>
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<th>Student</th>
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<th>Guided Notes (7)</th>
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</table>

Mean 99
Range 98-100

Notes. Numbers in parentheses indicate the number of quizzes independently scored by second observer during each condition. \(^a\) = Based on 3 quizzes only. \(^b\) = Based on 4 quizzes only. \(^c\) = Based on 5 quizzes only. \(^d\) = Based on 6 quizzes only.
Figure 1. Scores on daily social studies quizzes covering lectures in which Student 1 took her own notes or completed two forms of guided notes. Breaks in data path represent student absences.
**Student's own notes.** In the first phase in which students took their own notes, Student 1 answered correctly a mean of 6.3 out of a possible 10 questions, with a range of 3-10. During the second own notes phase, Student 1's quiz score was 8.4, with a range of 6-10.

**Short-form guided notes.** During the first guided notes phase, Student 1 earned a mean score of 9.1, with a range of 7-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 1 correctly answered a mean of 9.8 (range, 9-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 1's mean was 9.2 questions with a range of 8-10. During the second guided notes phase, Student 1 averaged 9.4 questions correct (range, 8-10) when long-form guided notes were used.

**Summary.** When Student 1 took her own lecture notes, the mean quiz score was 7.4, ranging from 3-10. When the short-form guided notes were used, Student 1's mean score was 9.4, with a range of 7-10. When long-form guided notes were used, her mean score was 9.3, ranging from 8-10. Student 1's combined guided notes mean score
was 9.4 which is 20% higher than her average score when taking her own notes.

**Student 2**

Figure 2 shows Student 2’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 2, an at-risk student, was present for 34 of the study’s 41 sessions. All seven absences were in the final guided notes phase.

*Student’s own notes.* In the first phase in which students took their own notes, Student 2 answered correctly a mean of 5.2 out of a possible 10 questions, with a range of 3-6. During the second own notes phase, Student 2’s quiz score was 3.8, with a range of 2-6.

*Short-form guided notes.* During the first guided notes phase, Student 2 earned a mean score of 6.6, with a range of 3-8, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 2 scored 10. All questions were correctly answered when using short-form guided notes.

*Long-form guided notes.* On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 2’s mean was 6.0 questions with a range of 2-9. During the second guided notes phase, Student 2 averaged 9.2 questions correct (range, 9-10) when long-form guided notes were used.
Figure 2. Scores on daily social studies quizzes covering lectures in which Student 2 took her own notes or completed two forms of guided notes. Circled data point indicates make-up quiz taken during a later session. Breaks in data path represent student absences.
Summary. When Student 2 took her own lecture notes, the mean quiz score was 4.5, ranging from 2-6. When the short-form guided notes were used, Student 2's mean score was 8.3, with a range of 3-10. When long-form guided notes were used, her mean score was 7.6, ranging from 2-10. Student 2's combined guided notes mean score was 7.8 which is 33% higher than her average score when taking her own notes.

Student 3

Figure 3 shows Student 3's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 3, a tutored SLD student, was present for 37 of the study's 41 sessions. One absence was in each of the own notes phases and two absences were in the final guided notes phase.

Student's own notes. In the first phase in which students took their own notes, Student 3 answered correctly a mean of 5.5 out of a possible 10 questions, with a range of 3-10. During the second own notes phase, Student 3's quiz score was 2.8, with a range of 0-4.

Short-form guided notes. During the first guided notes phase, Student 3 earned a mean score of 7.4, with a range of 6-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 3 correctly answered a mean of 7.6 (range,
Figure 3. Scores on daily social studies quizzes covering lectures in which Student 3 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 3's mean was 6.0 questions with a range of 4-8. During the second guided notes phase, Student 3 averaged 9.2 questions correct (range, 7-10) when long-form guided notes were used.

**Summary.** When Student 3 took his own lecture notes, the mean quiz score was 4.2, ranging from 0-10. When the short-form guided notes were used, Student 3's mean score was 7.5, with a range of 6-10. When long-form guided notes were used, his mean score was 7.6, ranging from 4-10. Student 3's combined guided notes mean score was 7.6 which is 34% higher than his average score when taking his own notes.

**Student 4**

Figure 4 shows Student 4's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 4, an SLD resource student, was present for 35 of the study's 41 sessions. One absence was in the second own notes phase. The remaining five absences were in the final guided notes phase.

**Student's own notes.** In the first phase in which students took their own notes, Student 4 answered
Figure 4. Scores on daily social studies quizzes covering lectures in which Student 4 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
correctly a mean of 1.8 out of a possible 10 questions, with a range of 0-6. During the second own notes phase, Student 4’s quiz score was 1.7, with a range of 1-3.

**Short-form guided notes.** During the first guided notes phase, Student 4 earned a mean score of 3.9, with a range of 0-8, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 4 correctly answered a mean of 5.7 (range, 2-8) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 4’s mean was 3.8 questions with a range of 1-8. During the second guided notes phase, Student 4 averaged 5.7 questions correct (range, 2-10) when long-form guided notes were used.

**Summary.** When Student 4 took his own lecture notes, the mean quiz score was 1.8, ranging from 0-6. When the short-form guided notes were used, Student 4’s mean score was 4.8, with a range of 0-8. When long-form guided notes were used, his mean score was 4.8, ranging from 1-10. Student 4’s combined guided notes mean score was 4.8 which is 30% higher than his average score when taking his own notes.
Student 5

Figure 5 shows Student 5’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 5, an at-risk student, was present for 38 of the study’s 41 sessions. One absence was in each of the two own notes phases and one absence was in the final guided notes phase.

Student’s own notes. In the first phase in which students took their own notes, Student 5 answered correctly a mean of 5.9 out of a possible 10 questions, with a range of 3-10. During the second own notes phase, Student 5’s quiz score was 2.8, with a range of 1-4.

Short-form guided notes. During the first guided notes phase, Student 5 earned a mean score of 8.3, with a range of 4-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 5 correctly answered a mean of 6.8 (range, 6-7) questions over material covered by short-form guided notes.

Long-form guided notes. On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 5’s mean was 7.0 questions with a range of 4-9. During the second guided notes phase, Student 5 averaged 8.2 questions correct (range, 6-10) when long-form guided notes were used.
Figure 5. Scores on daily social studies quizzes covering lectures in which Student 5 took her own notes or completed two forms of guided notes. Breaks in data path represent student absences.
Summary. When Student 5 took her own lecture notes, the mean quiz score was 4.4, ranging from 1-10. When the short-form guided notes were used, Student 5’s mean score was 7.6, with a range of 4-10. When long-form guided notes were used, her mean score was 7.6, ranging from 4-10. Student 5’s combined guided notes mean score was 7.6 which is 32% higher than her average score when taking her own notes.

Student 6

Figure 6 shows Student 6’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 6, an at-risk student, was present for 34 of the study’s 41 sessions. One absence was in the first own notes phase, three were in the first guided notes phase, two were in the second own notes phase, and two absences were in the final guided notes phase.

Student’s own notes. In the first phase in which students took their own notes, Student 6 answered correctly a mean of 5.5 out of a possible 10 questions, with a range of 3-7. During the second own notes phase, Student 6’s quiz score was 4.6, with a range of 3-6.

Short-form guided notes. During the first guided notes phase, Student 6 earned a mean score of 8.4, with a range of 6-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 6 correctly answered a mean of 7.8 (range,
Figure 6. Scores on daily social studies quizzes covering lectures in which Student 6 took her own notes or completed two forms of guided notes. Circled data point indicates make-up quiz taken during a later session. Breaks in data path represent student absences.
6-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 6's mean was 7.2 questions with a range of 6-9. During the second guided notes phase, Student 6 averaged 8.4 questions correct (range, 7-10) when long-form guided notes were used.

**Summary.** When Student 6 took her own lecture notes, the mean quiz score was 5.0, ranging from 3-7. When the short-form guided notes were used, Student 6's mean score was 8.1, with a range of 6-10. When long-form guided notes were used, her mean score was 7.8, ranging from 6-10. Student 6's combined guided notes mean score was 8.0 which is 30% higher than her average score when taking her own notes.

**Student 7**

Figure 7 shows Student 7's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 7, an at-risk student, was present for 36 of the study's 41 sessions. All five absences were in the final guided notes phase.

**Student's own notes.** In the first phase in which students took their own notes, Student 7 answered correctly a mean of 4.8 out of a possible 10 questions,
Figure 7. Scores on daily social studies quizzes covering lectures in which Student 7 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
with a range of 2-7. During the second own notes phase, Student 7’s quiz score was 4.7, with a range of 1-6.

**Short-form guided notes.** During the first guided notes phase, Student 7 earned a mean score of 8.7, with a range of 5-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 7 correctly answered a mean of 9.8 (range, 8-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 7’s mean was 8.7 questions with a range of 7-10. During the second guided notes phase, Student 7 averaged 9.0 questions correct (range, 9-10) when long-form guided notes were used.

**Summary.** When Student 7 took his own lecture notes, the mean quiz score was 4.8, ranging from 1-7. When the short-form guided notes were used, Student 7’s mean score was 9.2, with a range of 5-10. When long-form guided notes were used, his mean score was 8.8, ranging from 7-10. Student 7’s combined guided notes mean score was 9.0 which is 42% higher than his average score when taking his own notes.

**Student 8**

Figure 8 shows Student 8’s performance on the daily
Figure 8. Scores on daily social studies quizzes covering lectures in which Student 8 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
10-item quizzes by experimental phase and guided notes format. Student 8, an resource SLD student, was present for 34 of the study's 41 sessions. All seven absences were in the final guided notes phase.

Student's own notes. In the first phase in which students took their own notes, Student 8 answered correctly a mean of 5.8 out of a possible 10 questions, with a range of 2-8. During the second own notes phase, Student 8's quiz score was 5.4, with a range of 1-7.

Short-form guided notes. During the first guided notes phase, Student 8 earned a mean score of 8.3, with a range of 6-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 8 correctly answered a mean of 8.0 (all scores were 8) questions over material covered by short-form guided notes.

Long-form guided notes. On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 8's mean was 9.7 questions with a range of 9-10. During the second guided notes phase, Student 8 averaged 9.7 questions correct (range, 9-10) when long-form guided notes were used.

Summary. When Student 8 took his own lecture notes, the mean quiz score was 5.6, ranging from 1-8. When the short-form guided notes were used, Student 8's mean score
was 8.2, with a range of 6-10. When long-form guided notes were used, his mean score was 9.7, ranging from 8-10. Student 9’s combined guided notes mean score was 9.4 which is 38% higher than his average score when taking his own notes.

**Student 9**

Figure 9 shows Student 9’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 9, an at-risk student, was present for 37 of the study’s 41 sessions. One absence was in the second own notes phase and three absences were in the final guided notes phase.

**Student’s own notes.** In the first phase in which students took their own notes, Student 9 answered correctly a mean of 5.7 out of a possible 10 questions, with a range of 4-8. During the second own notes phase, Student 9’s quiz score was 5.8, with a range of 2-7.

**Short-form guided notes.** During the first guided notes phase, Student 9 earned a mean score of 8.3, with a range of 6-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 9 correctly answered a mean of 8.0 (range, 8-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes
Figure 9. Scores on daily social studies quizzes covering lectures in which Student 9 took his own notes or completed two forms of guided notes. Circled data point indicates make-up quiz taken during a later session. Breaks in data path represent student absences.
during the first guided notes phase, Student 9's mean was 9.5 questions with a range of 9-10. During the second guided notes phase, Student 9 averaged 9.7 questions correct (range, 8-10) when long-form guided notes were used.

**Summary.** When Student 9 took his own lecture notes, the mean quiz score was 5.8, ranging from 2-8. When the short-form guided notes were used, Student 9's mean score was 8.2, with a range of 6-10. When long-form guided notes were used, his mean score was 9.6, ranging from 9-10. Student 9's combined guided notes mean score was 9.0 which is 32% higher than his average score when taking his own notes.

**Student 10**

Figure 10 shows Student 10's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 10, an SLD resource student, was present for 40 of the study's 41 sessions. The absence was in the first own notes phase.

**Student's own notes.** In the first phase in which students took their own notes, Student 10 answered correctly a mean of 4.8 out of a possible 10 questions, with a range of 1-7. During the second own notes phase, Student 10's quiz score was 4.7, with a range of 2-9.

**Short-form guided notes.** During the first guided notes phase, Student 10 earned a mean score of 9.1, with
Figure 10. Scores on daily social studies quizzes covering lectures in which Student 10 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
a range of 8-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 10 correctly answered a mean of 8.5 (range, 7-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 10’s mean was 9.2 questions with a range of 9-10. During the second guided notes phase, Student 10 averaged 9.7 questions correct (range, 9-10) when long-form guided notes were used.

**Summary.** When Student 10 took his own lecture notes, the mean quiz score was 4.8, ranging from 1-9. When the short-form guided notes were used, Student 10’s mean score was 8.8, with a range of 7-10. When long-form guided notes were used, his mean score was 9.7, ranging from 9-10. Student 10’s combined guided notes mean score was 9.2 which is 44% higher than his average score when taking his own notes.

**Student 11**

Figure 11 shows Student 11’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 11, an at-risk student, was present for 40 of the study’s 41 sessions. The absence was in the first own notes phase.
Figure 11. Scores on daily social studies quizzes covering lectures in which Student 11 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
Student’s own notes. In the first phase in which students took their own notes, Student 11 answered correctly a mean of 6.5 out of a possible 10 questions, with a range of 4-10. During the second own notes phase, Student 11’s quiz score was 5.0, with a range of 2-10.

Short-form guided notes. During the first guided notes phase, Student 11 earned a mean score of 8.1, with a range of 5-9, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 11 correctly answered a mean of 9.5 (range, 6-10) questions over material covered by short-form guided notes.

Long-form guided notes. On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 11’s mean was 8.5 questions with a range of 5-10. During the second guided notes phase, Student 11 averaged 9.2 questions correct (range, 7-10) when long-form guided notes were used.

Summary. When Student 11 took his own lecture notes, the mean quiz score was 5.8, ranging from 2-10. When the short-form guided notes were used, Student 11’s mean score was 8.8, with a range of 5-10. When long-form guided notes were used, his mean score was 8.8, ranging from 5-10. Student 11’s combined guided notes mean score
was 8.8 which is 30% higher than his average score when taking his own notes.

Student 12

Figure 12 shows Student 12's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 12, a tutored SLD student, was present for 37 of the study's 41 sessions. One absence was in the first guided notes phase, one in the second own notes phase and two absences were in the final guided notes phase.

Student's own notes. In the first phase in which students took their own notes, Student 12 answered correctly a mean of 7.3 out of a possible 10 questions, with a range of 6-9. During the second own notes phase, Student 12's quiz score was 8.0, with a range of 5-10.

Short-form guided notes. During the first guided notes phase, Student 12 earned a mean score of 9.0, with a range of 7-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 12 correctly answered a mean of 9.3 (range, 8-10) questions over material covered by short-form guided notes.

Long-form guided notes. On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 12's mean was 9.0 questions with a range of 8-10. During the
Figure 12. Scores on daily social studies quizzes covering lectures in which Student 12 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
second guided notes phase, Student 12 scored 10 on each quiz when long-form guided notes were used.

**Summary.** When Student 12 took his own lecture notes, the mean quiz score was 7.7, ranging from 5-10. When the short-form guided notes were used, Student 12’s mean score was 9.2, with a range of 7-10. When long-form guided notes were used, his mean score was 9.5, ranging from 8-10. Student 12’s combined guided notes mean score was 9.3 which is 16% higher than his average score when taking his own notes.

**Student 13**

Figure 13 shows Student 13’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 13, a tutored SLD student, was present for 40 of the study’s 41 sessions. The absence was in the second own notes phase.

**Student’s own notes.** In the first phase in which students took their own notes, Student 13 answered correctly a mean of 6.9 out of a possible 10 questions, with a range of 2-10. During the second own notes phase, Student 13’s quiz score was 5.8, with a range of 1-8.

**Short-form guided notes.** During the first guided notes phase, Student 13 earned a mean score of 9.1, with a range of 7-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 13 correctly answered a mean of 9.2
Figure 13. Scores on daily social studies quizzes covering lectures in which Student 13 took his own notes or completed two forms of guided notes. Circled data point indicates make-up quiz taken during a later session. Breaks in data path represent student absences.
(range, 8-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 13's mean was 9.2 questions with a range of 8-10. During the second guided notes phase, Student 13 averaged 9.5 questions correct (range, 7-10) when long-form guided notes were used.

**Summary.** When Student 13 took his own lecture notes, the mean quiz score was 6.4, ranging from 1-10. When the short-form guided notes were used, Student 13's mean score was 9.2, with a range of 7-10. When long-form guided notes were used, his mean score was 9.4, ranging from 8-10. Student 13's combined guided notes mean score was 9.2 which is 28% higher than his average score when taking his own notes.

**Student 14**

Figure 14 shows Student 14's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 14, an at-risk student, was present for 37 of the study's 41 sessions. One absence was in the first guided notes phase and three were in the final guided notes phase.

**Student's own notes.** In the first phase in which students took their own notes, Student 14 answered
Figure 14. Scores on daily social studies quizzes covering lectures in which Student 14 took her own notes or completed two forms of guided notes. Breaks in data path represent student absences.
correctly a mean of 6.8 out of a possible 10 questions, with a range of 4-10. During the second own notes phase, Student 14’s quiz score was 6.4, with a range of 4-8.

**Short-form guided notes.** During the first guided notes phase, Student 14 earned a mean score of 9.0, with a range of 7-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 14 correctly answered a mean of 8.5 (range, 9-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 14’s mean was 8.8 questions with a range of 7-10. During the second guided notes phase, Student 14 averaged 9.7 questions correct (range, 9-10) when long-form guided notes were used.

**Summary.** When Student 14 took her own lecture notes, the mean quiz score was 6.6, ranging from 4-10. When the short-form guided notes were used, Student 14’s mean score was 8.8, with a range of 7-10. When long-form guided notes were used, her mean score was 9.2, ranging from 5-10. Student 14’s combined guided notes mean score was 9.3 which is 27% higher than her average score when taking her own notes.
Student 15

Figure 15 shows Student 15’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 15, an at-risk student, was present for 37 of the study’s 41 sessions. All four absences were in the final guided notes phase.

**Student’s own notes.** In the first phase in which students took their own notes, Student 15 answered correctly a mean of 5.1 out of a possible 10 questions, with a range of 3-8. During the second own notes phase, Student 15’s quiz score was 4.0, with a range of 1-7.

**Short-form guided notes.** During the first guided notes phase, Student 15 earned a mean score of 7.7, with a range of 6-9, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 15 correctly answered a mean of 9.5 (range, 6-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 15’s mean was 8.5 questions with a range of 7-9. During the second guided notes phase, Student 15 averaged 9.8 questions correct (range, 9-10) when long-form guided notes were used.
Figure 15. Scores on daily social studies quizzes covering lectures in which Student 15 took his own notes or completed two forms of guided notes. Breaks in data path represent student absences.
Summary. When Student 15 took his own lecture notes, the mean quiz score was 4.4, ranging from 1-8. When the short-form guided notes were used, Student 15's mean score was 8.6, with a range of 6-10. When long-form guided notes were used, his mean score was 9.2, ranging from 7-10. Student 15's combined guided notes mean score was 8.6 which is 42% higher than his average score when taking his own notes.

Student 16

Figure 16 shows Student 16's performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 16, an SLD resource student, was present for 39 of the study's 41 sessions. One absence was in the first own notes phase and one was in the final guided notes phase.

Student's own notes. In the first phase in which students took their own notes, Student 16 answered correctly a mean of 4.3 out of a possible 10 questions, with a range of 2-7. During the second own notes phase, Student 16's quiz score was 3.0, with a range of 0-5.

Short-form guided notes. During the first guided notes phase, Student 16 earned a mean score of 6.7, with a range of 5-8, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 16 correctly answered a mean of 7.3
Figure 16. Scores on daily social studies quizzes covering lectures in which Student 16 took her own notes or completed two forms of guided notes. Breaks in data path represent student absences.
(range, 7-8) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 16’s mean was 7.2 questions with a range of 5-9. During the second guided notes phase, Student 16 averaged 8.2 questions correct (range, 5-9) when long-form guided notes were used.

**Summary.** When Student 16 took her own lecture notes, the mean quiz score was 3.6, ranging from 0-7. When the short-form guided notes were used, Student 16’s mean score was 7.0, with a range of 5-8. When long-form guided notes were used, her mean score was 7.7, ranging from 5-10. Student 16’s combined guided notes mean score was 7.4 which is 38% higher than her average score when taking her own notes.

**Student 17**

Figure 17 shows Student 17’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 17, an at-risk student, was present for all 41 of the study’s 41 sessions.

**Student’s own notes.** In the first phase in which students took their own notes, Student 17 answered correctly a mean of 5.3 out of a possible 10 questions,
Figure 17. Scores on daily social studies quizzes covering lectures in which Student 17 took her own notes or completed two forms of guided notes.
with a range of 1-10. During the second own notes phase, Student 17’s quiz score was 2.7, with a range of 1-6.

**Short-form guided notes.** During the first guided notes phase, Student 17 earned a mean score of 6.1, with a range of 4-8, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 17 correctly answered a mean of 5.5 (range, 3-9) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 17’s mean was 5.3 questions with a range of 3-8. During the second guided notes phase, Student 17 averaged 6.5 questions correct (range, 1-10) when long-form guided notes were used.

**Summary.** When Student 17 took her own lecture notes, the mean quiz score was 4.0, ranging from 1-10. When the short-form guided notes were used, Student 17’s mean score was 5.8, with a range of 3-9. When long-form guided notes were used, her mean score was 5.9, ranging from 1-10. Student 17’s combined guided notes mean score was 5.8 which is 18% higher than her average score when taking her own notes.

**Student 18**

Figure 18 shows Student 18’s performance on the
Figure 18. Scores on daily social studies quizzes covering lectures in which Student 18 took her own notes or completed two forms of guided notes.
daily 10-item quizzes by experimental phase and guided notes format. Student 18, an SLD resource student, was present for all 41 of the study’s 41 sessions.

Student’s own notes. In the first phase in which students took their own notes, Student 18 answered correctly a mean of 5.1 out of a possible 10 questions, with a range of 1-8. During the second own notes phase, Student 18’s quiz score was 2.0, with a range of 1-3.

Short-form guided notes. During the first guided notes phase, Student 18 earned a mean score of 5.1, with a range of 2-8, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 18 correctly answered a mean of 4.2 (range, 1-7) questions over material covered by short-form guided notes.

Long-form guided notes. On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 18’s mean was 3.5 questions with a range of 1-7. During the second guided notes phase, Student 18 averaged 7.3 questions correct (range, 4-10) when long-form guided notes were used.

Summary. When Student 18 took her own lecture notes, the mean quiz score was 2.5, ranging from 1-8. When the short-form guided notes were used, Student 18’s mean score was 4.7, with a range of 1-8. When long-form
guided notes were used, her mean score was 5.4, ranging from 1-10. Student 18’s combined guided notes mean score was 5.1 which is 26% higher than her average score when taking her own notes.

**Student 19**

Figure 19 shows Student 19’s performance on the daily 10-item quizzes by experimental phase and guided notes format. Student 19, an at-risk student, was present for 39 of the study’s 41 sessions. One absence was in the first guided notes phase and one was in the final guided notes phase.

**Student’s own notes.** In the first phase in which students took their own notes, Student 19 answered correctly a mean of 7.7 out of a possible 10 questions, with a range of 6-10. During the second own notes phase, Student 19’s quiz score was 7.7, with a range of 5-10.

**Short-form guided notes.** During the first guided notes phase, Student 19 earned a mean score of 8.6, with a range of 5-10, following lectures in which the short-form guided notes were used. In the second guided notes phase, Student 19 correctly answered a mean of 9.8 (range, 9-10) questions over material covered by short-form guided notes.

**Long-form guided notes.** On daily quizzes given over information recorded on the long-form of guided notes during the first guided notes phase, Student 19’s mean
Figure 19. Scores on daily social studies quizzes covering lectures in which Student 19 took his own notes or completed two forms of guided notes. Circled data point indicates make-up quiz taken during a later session. Breaks in data path represent student absences.
was 9.2 questions with a range of 8-10. During the second guided notes phase, Student 19 averaged 9.6 questions correct (range, 8-10) when long-form guided notes were used.

Summary. When Student 19 took his own lecture notes, the mean quiz score was 7.7, ranging from 5-10. When the short-form guided notes were used, Student 19's mean score was 9.2, with a range of 5-10. When long-form guided notes were used, his mean score was 9.4, ranging from 8-10. Student 19's combined guided notes mean score was 9.2 which is 15% higher than his average score when taking his own notes.

Group Summary

Table 4 shows the mean number of quiz questions answered correctly by each student during each phase and condition of the study.

Students' own notes. SLD resource students answered a mean of 3.9 questions correctly during the first own notes phase of nine sessions. The range across students was 1.8-5.8. Tutored SLD students had a mean of 6.5 correct questions with a range of 5.5-7.3, while at-risk students had a mean of 5.8 with a range of 4.8-7.7. The class as a whole had a mean of 5.5 questions answered correctly during the first own notes phase, with a range of 1.8-7.7.
Table 4

Mean Number of Questions Answered Correctly on Daily Quizzes by Phases.

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Note. a = GN indicates Guided Notes. Numbers in parentheses indicate the number of sessions in phase.
SLD resource students answered a mean of 3.4 questions correctly during the second own notes phase of seven sessions. The range was 1.7-5.4. Tutored SLD students had a mean of 6.2 correct questions with a range of 2.8-8.4, while at-risk students had a mean of 4.8 with a range of 2.7-7.7. The class as a whole had a mean of 4.8 questions answered correctly during the second own notes phase with a range of 1.7-8.4.

Short-form guided notes. In the first guided notes phase, short-form guided notes were used in seven sessions. During this phase and condition, the SLD resource students had a mean score of 6.6 with a range of 3.9-9.1. Tutored SLD students had a mean score of 8.6 with a range of 7.4-9.1. At-risk students had a mean of 8.0 with a range of 6.1-9.0. The class as a whole, during the first guided notes phase when the short-form notes were used, correctly answered 7.7 questions with a range of 3.9-9.1.

In the second guided notes phase, short-form guided notes were used in six sessions. During this phase and condition, the SLD resource students had a mean score of 6.7 with a range of 4.2-8.5. Tutored SLD students had a mean score of 9.0 with a range of 7.6-9.8. At-risk students had a mean of 8.0 with a range of 5.5-10.0. The class as a whole, during the second guided notes phase
when the short-form notes were used, correctly answered 8.1 questions with a range of 4.2-10.0.

**Long-form guided notes.** In the first guided notes phase in which long-form guided notes were used for six sessions, the resource students had a mean score of 6.7 with a range of 3.5-9.7. The tutored SLD students had a mean score of 8.4 with a range of 6.0-9.2. At-risk students had a mean score of 7.9 with a range of 5.3-9.5. For the class as a whole, the mean score was 7.7 with a range of 3.5-9.7.

In the second guided notes phase in which long-form guided notes were again used for six sessions, the resource students had a mean score of 8.1 with a range of 5.7-9.7. The tutored SLD students had a mean score of 9.5 with a range of 9.2-10.0. At-risk students had a mean score of 8.9 with a range of 6.5-9.7. For the class as a whole, the mean score was 8.8 with a range of 5.7-9.7.

**Summary.** Table 5 shows the mean number of quiz questions answered correctly by each student during the different conditions of the study. The SLD resource students answered correctly a mean of 3.7 questions during the 17 sessions in which they took their own notes, with a range across students of 1.8-5.6. The four tutored SLD students had a mean score of 6.4, (range, 4.2-7.4) on quizzes over lectures during which they took
Table 5

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*Note.* Numbers in parentheses indicate the number of sessions in each condition.
their own notes. The at-risk students had a mean score of 5.3 with a range of 4.0-7.7. The class mean when students took their own notes was 5.1 with a range of 1.8-7.7.

Students took short-form guided notes for a total of 13 sessions. The mean score for resource students was 6.7 with a range of 4.7-8.8. SLD tutored students had a mean score of 8.8 with a range of 7.5-9.4. At-risk students had a mean score of 8.3 with a range of 5.8-9.2. For the class, as a whole, the mean was 8.3 with a range of 4.8-9.4.

Long-form guided notes were used for 12 sessions. When the long-form guided notes were used, SLD resource students achieved a mean score of 7.4 with a range of 4.8-9.7. Tutored SLD students had a mean score of 9.0 with a range of 7.6-9.5. At-risk students had a mean of 8.4 with a range of 5.9-9.6.

In all, both the short- and long-form guided notes were used for a total of 25 sessions. The SLD resource students scored a mean of 7.2 with a range of 4.8-9.4 when using guided notes. Tutored SLD students had a mean score of 8.9 with a range of 7.6-9.4. The at-risk students had a mean score of 8.3 with a range of 5.8-9.3 when guided notes were used. The class, as a whole, had a mean score of 8.1 using guided notes with a range of 4.8-9.3.
Table 6 shows the number of students earning letter grade equivalents for their mean quiz score in the own notes and guided notes conditions. When students took their own notes, there were no A's or B's, and 14 of the 19 students made a failing grade. When guided notes were in use, 12 students made A's or B's, and only three made a failing grade.

**Bi-Weekly Test Scores**

**Interobserver Agreement**

Table 7 shows the percentage of interobserver agreement on the bi-weekly test scores for each individual student by experimental phase. All five bi-weekly tests were checked for interobserver agreement. Total agreement on bi-weekly tests for individual students ranged from 97-100% with a group mean of 99%.

Table 8 shows the percentage of interobserver agreement for each student on the bi-weekly tests by condition. Total agreement for the group ranged from 97-100% with a group mean of 99%.

**Student 1**

Student 1, an SLD tutored student, was present for all five of the bi-weekly tests.

**Student’s own notes.** On the first bi-weekly test in which student’s own notes were used, Student 1 correctly answered 80% of the questions. During the second
Table 6

Number of Students Earning Letter Grade Equivalents Based on Mean Daily Quizzes by Condition

<table>
<thead>
<tr>
<th>Grade</th>
<th>Own Notes</th>
<th>Guided Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (90-100%)</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>B (80-90%)</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>C (70-79%)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D (60-69%)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>E (59% and below)</td>
<td>14</td>
<td>3</td>
</tr>
</tbody>
</table>
Table 7

Percentage of Interobserver Agreement on Bi-Weekly Test Scores by Experimental Phase.

<table>
<thead>
<tr>
<th>Student Own 1(1)</th>
<th>Guided 1(2)</th>
<th>Own 2(1)</th>
<th>Guided 2(1)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>95</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
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<td>100</td>
<td>98</td>
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<tr>
<td>3</td>
<td>-</td>
<td>100</td>
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<tr>
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<td>16</td>
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<tr>
<td>18</td>
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<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>19</td>
<td>95</td>
<td>100*</td>
<td>95</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean 99
Range 97-100

Notes. Numbers in parentheses indicate the number of tests in phase. a = Dash indicates no data. b = Based on one test only.
Table 8
Percentage of Interobserver Agreement on Bi-Weekly Test Scores by Condition.

<table>
<thead>
<tr>
<th>Student</th>
<th>Own Notes (2)</th>
<th>Guided Notes (3)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>98</td>
<td>99</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
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<tr>
<td>3</td>
<td>100*</td>
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<td>99</td>
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<tr>
<td>4</td>
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<td>99</td>
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<td>9</td>
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<td>100*</td>
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<tr>
<td>14</td>
<td>95</td>
<td>100*</td>
<td>97</td>
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<tr>
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<tr>
<td>16</td>
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<td>95</td>
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<tr>
<td>17</td>
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<td>100</td>
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<tr>
<td>18</td>
<td>98</td>
<td>100</td>
<td>99</td>
</tr>
<tr>
<td>19</td>
<td>95</td>
<td>100</td>
<td>98</td>
</tr>
</tbody>
</table>

Mean: 99
Range: 97-100

Notes. Numbers in parentheses indicate the number of tests. *a = Based on 1 test only. B = Based on 2 tests only.
bi-weekly test covering her own notes, Student 1 made a score of 30%. The mean score for Student 1 with her own notes was 55%.

**Short-form guided notes.** Student 1 took three bi-weekly tests in which questions from the short-form of guided notes were used. On all three tests, this student answered correctly 100% of the questions over concepts/facts covered by short-form of guided notes.

**Long-form guided notes.** On the three bi-weekly tests in which questions came from the long-form guided notes, Student 1 correctly answered a total of 75%, 89%, and 100% of the questions for a mean score of 88%.

**Summary.** When Student 1 used her own notes, the bi-weekly test score mean was 55%. When guided notes were used, the mean score on the bi-weekly test was 95% with a mean of 100% for questions from short-form notes and 88% for questions from long-form notes.

**Student 2**

Student 2, an at-risk student, was present for four of the five bi-weekly tests. Student 2 was absent when the final bi-weekly test from guided notes was administered.

**Student's own notes.** On the first bi-weekly test in which student’s own notes were used, Student 2 answered correctly 15% of the questions. During the second bi-weekly test covering her own notes, Student 2 made a
score of 5%. The mean score for Student 2 with her own notes was 10%.

**Short-form guided notes.** Student 2 took two bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 42%, and 73% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 58%.

**Long-form guided notes.** With long-form guided notes, Student 2 had means of 33%, and 67% of the questions correct for a total mean of 50%.

**Summary.** When Student 2 used her own notes, the bi-weekly test score mean was 10%. When guided notes were used, the mean score on the bi-weekly test was 60% with a mean of 58% for questions from short-form notes and 50% for questions from long-form notes.

**Student 3**

Student 3, an SLD tutored student, was present for four of the five bi-weekly tests.

**Student’s own notes.** Student 3 was absent during the first bi-weekly test in which student’s own notes were used. During the second bi-weekly test covering his own notes, Student 3 made a score of 20%.

**Short-form guided notes.** Student 3 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student
answered correctly 62%, 73%, and 86% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 74%.

**Long-form guided notes.** On the three bi-weekly tests in which questions came from the long-form guided notes, Student 3 correctly answered a total of 33%, 78%, and 92% of the questions for a mean score of 68%.

**Summary.** When Student 3 used his own notes, the bi-weekly test score mean was 20%. When guided notes were used, the mean score on the bi-weekly test was 72% with a mean of 74% for questions from short-form notes and 68% for questions from long-form notes.

**Student 4**

Student 4, an SLD resource student, was present for all five of the bi-weekly tests.

**Student's own notes.** On the first bi-weekly test in which student's own notes were used, Student 4 correctly answered 15% of the questions. During the second bi-weekly test covering his own notes, Student 4 made a score of 5%. The mean score for Student 4 with his own notes was 10%.

**Short-form guided notes.** Student 4 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 38%, 54%, and 14% of the questions.
over concepts/facts covered by the short-form of guided notes for a mean score of 35%.

**Long-form guided notes.** On the three bi-weekly tests in which questions came from the long-form guided notes, Student 4 correctly answered a total of 67%, 0%, and 15% of the questions for a mean score of 27%.

**Summary.** When Student 4 used his own notes, the bi-weekly test score mean was 10%. When guided notes were used, the mean score on the bi-weekly test was 25% with a mean of 35% for questions from short-form notes and 27% for questions from long-form notes.

**Student 5**

Student 5, an at-risk student, was present for all five of the bi-weekly tests.

**Student’s own notes.** On the first bi-weekly test in which student’s own notes were used, Student 5 answered correctly 50% of the questions. During the second bi-weekly test covering her own notes, Student 5 made a score of 10%. The mean score for Student 5 with her own notes was 30%.

**Short-form guided notes.** Student 5 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 88%, 73%, and 71% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 77%.
Long-form guided notes. On the three bi-weekly tests in which questions came from the long-form guided notes, Student 5 correctly answered a total of 75%, 56%, and 92% of the questions for a mean score of 74%.

Summary. When Student 5 used her own notes, the bi-weekly test score mean was 30%. When guided notes were used, the mean score on the bi-weekly test was 75% with a mean of 77% for questions from short-form notes and 74% for questions from long-form notes.

Student 6

Student 6, an at-risk student, was present for all five of the bi-weekly tests.

Student’s own notes. On the first bi-weekly test in which student’s own notes were used, Student 6 correctly answered 50% of the questions. During the second bi-weekly test covering her own notes, Student 6 made a score of 30%. The mean score for Student 6 with her own notes was 40%.

Short-form guided notes. Student 6 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 62%, 100%, and 57% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 73%.

Long-form guided notes. On the three bi-weekly tests in which questions came from the long-form guided
notes, Student 6 correctly answered a total of 67%, 44%, and 77% of the questions for a mean score of 63%.

**Summary.** When Student 6 used her own notes, the bi-weekly test score mean was 40%. When guided notes were used, the mean score on the bi-weekly test was 72% with a mean of 73% for questions from short-form notes and 63% for questions from long-form notes.

**Student 7**

Student 7, an at-risk student, was present for all five of the bi-weekly tests.

**Student's own notes.** On the first bi-weekly test in which student's own notes were used, Student 7 correctly answered 70% of the questions. During the second bi-weekly test covering his own notes, Student 7 made a score of 40%. The mean score for Student 7 with his own notes was 50%.

**Short-form guided notes.** Student 7 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 100%, 91%, and 71% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 87%.

**Long-form guided notes.** On the three bi-weekly tests in which questions came from the long-form guided notes, Student 7 correctly answered a total of 83%, 100%, and 100% of the questions for a mean score of 94%.
Summary. When Student 7 used his own notes, the bi-weekly test score mean was 50%. When guided notes were used, the mean score on the bi-weekly test was 90% with a mean of 87% for questions from short-form notes and 94% for questions from long-form notes.

Student 8

Student 8, an SLD resource student, was present for all five of the bi-weekly tests.

Student's own notes. On the first bi-weekly test in which student's own notes were used, Student 8 correctly answered 70% of the questions. During the second bi-weekly test covering his own notes, Student 8 made a score of 55%. The mean score for Student 8 with his own notes was 62%.

Short-form guided notes. Student 8 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 88%, 100%, and 86% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 91%.

Long-form guided notes. On the three bi-weekly tests in which questions came from the long-form guided notes, Student 8 correctly answered a total of 100%, 89%, and 92% of the questions for a mean score of 94%.

Summary. When Student 8 used his own notes, the bi-weekly test score mean was 62%. When guided notes
were used, the mean score on the bi-weekly test was 92% with a mean of 91% for questions from short-form notes and 94% for questions from long-form notes.

**Student 9**

Student 9, an at-risk student, was present for four of the five bi-weekly tests. Student 9 missed the final test during which guided notes were used.

**Student's own notes.** On the first bi-weekly test in which student's own notes were used, Student 9 correctly answered 70% of the questions. During the second bi-weekly test covering his own notes, Student 9 made a score of 40%. The mean score for Student 9 with his own notes was 55%.

**Short-form guided notes.** Student 9 took two bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 63% and 100% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 82%.

**Long-form guided notes.** On the two bi-weekly tests in which questions came from long-form guided notes, Student 9 answered all questions with 100% accuracy.

**Summary.** When Student 9 used his own notes, the bi-weekly test score mean was 55%. When guided notes were used, the mean score on the bi-weekly test was 90%
with a mean of 82% for questions from short-form notes
and 100% for questions from long-form notes.

**Student 10**

Student 10, an SLD resource student, was present for
all five of the bi-weekly tests.

**Student's own notes.** On the first bi-weekly test in
which student's own notes were used, Student 10 correctly
answered 50% of the questions. During the second
bi-weekly test covering his own notes, Student 10 made a
score of 35%. The mean score for Student 10 with his own
notes was 42%.

**Short-form guided notes.** Student 10 took three
bi-weekly tests in which questions from the short-form of
guided notes were used. On these tests, this student
answered correctly 100%, 100%, and 71% of the questions
over concepts/facts covered by the short-form of guided
notes for a mean score of 90%.

**Long-form guided notes.** On the three bi-weekly
tests in which questions came from the long-form guided
notes, Student 10 correctly answered a total of 100% of
the questions on each of the 3 tests.

**Summary.** When Student 10 used his own notes, the
bi-weekly test score mean was 42%. When guided notes
were used, the mean score on the bi-weekly test was 95%
with a mean of 90% for questions from short-form notes
and 100% for questions from long-form notes.
**Student 11**

Student 11, an SLD tutored student, was present for four of the five bi-weekly tests.

**Student’s own notes.** On the first bi-weekly test in which student’s own notes were used, Student 11 correctly answered 60% of the questions. During the second bi-weekly test covering his own notes, Student 11 made a score of 55%. The mean score for Student 11 with his own notes was 58%.

**Short-form guided notes.** Student 11 took two bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 75% and 86% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 80%.

**Long-form guided notes.** On the two bi-weekly tests in which questions came from the long-form guided notes, Student 11 correctly answered a total of 100% and 92% of the questions for a mean score of 96%.

**Summary.** When Student 11 used his own notes, the bi-weekly test score mean was 58%. When guided notes were used, the mean score was 88% with a mean of 80% for short-form notes and 96% for long-form notes’ questions.

**Student 12**

Student 12, an SLD tutored student, was present for all five of the bi-weekly tests.
Student’s own notes. On the first bi-weekly test in which student’s own notes were used, Student 12 correctly answered 75% of the questions. During the second bi-weekly test covering his own notes, Student 12 made a score of 65%. The mean score for Student 12 with his own notes was 70%.

Short-form guided notes. Student 12 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 100%, 100%, and 71% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 90%.

Long-form guided notes. On the three bi-weekly tests in which questions came from the long-form guided notes, Student 12 correctly answered a total of 92%, 100%, and 92% of the questions for a mean score of 95%.

Summary. When Student 12 used his own notes, the bi-weekly test score mean was 70%. When guided notes were used, the mean score on the bi-weekly test was 92% with a mean of 90% for questions from short-form notes and 95% for questions from long-form notes.

Student 13

Student 13, an SLD tutored student, was present for all five of the bi-weekly tests.

Student’s own notes. On the first bi-weekly test in which student’s own notes were used, Student 13 correctly
answered 85% of the questions. During the second bi-weekly test covering his own notes, Student 13 made a score of 35%. The mean score for Student 13 with his own notes was 60%.

**Short-form guided notes.** Student 13 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 100% of the questions over concepts/facts covered by the short-form of guided notes.

**Long-form guided notes.** On the three bi-weekly tests in which questions came from the long-form guided notes, Student 13 again correctly answered a total of 100% of the questions.

**Summary.** When Student 13 used his own notes, the bi-weekly test score mean was 60%. When guided notes were used, the mean score on the bi-weekly test was 100%. Student 13 answered correctly 100% of the questions from both the short-form and long-form notes.

**Student 14**

Student 14, an at-risk student, was present for four of the five bi-weekly tests.

**Student's own notes.** On the first bi-weekly test in which student's own notes were used, Student 14 correctly answered 70% of the questions. During the second bi-weekly test covering her own notes, Student 14 made a
score of 55%. The mean score for Student 14 with her own notes was 62%.

**Short-form guided notes.** Student 14 took two bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 100% of the questions over concepts/facts covered by the short-form of guided notes.

**Long-form guided notes.** On the two bi-weekly tests in which questions came from the long-form guided notes, Student 14 correctly answered a total of 92% and 89% of the questions for a mean score of 91%.

**Summary.** When Student 14 used her own notes, the bi-weekly test score mean was 62%. When guided notes were used, the mean score on the bi-weekly test was 95% with a mean of 100% for questions from short-form notes and 91% for questions from long-form notes.

**Student 15**

Student 15, an at-risk student, was present for all five of the bi-weekly tests.

**Student’s own notes.** On the first bi-weekly test in which student’s own notes were used, Student 15 correctly answered 45% of the questions. During the second bi-weekly test covering his own notes, Student 15 made a score of 40%. The mean score for Student 15 with his own notes was 42%.
Short-form guided notes. Student 15 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 88%, 73%, and 86% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 82%.

Long-form guided notes. On the three bi-weekly tests in which questions came from the long-form guided notes, Student 15 correctly answered a total of 83%, 89%, and 100% of the questions for a mean score of 91%.

Summary. When Student 15 used his own notes, the bi-weekly test score mean was 42%. When guided notes were used, the mean score on the bi-weekly test was 88% with a mean of 82% for questions from short-form notes and 91% for questions from long-form notes.

Student 16

Student 16, an SLD resource student, was present for all five of the bi-weekly tests.

Student's own notes. On the first bi-weekly test in which student's own notes were used, Student 16 correctly answered 50% of the questions. During the second bi-weekly test covering her own notes, Student 16 made a score of 20%. The mean score for Student 16 with her own notes was 35%.

Short-form guided notes. Student 16 took three bi-weekly tests in which questions from the short-form of
guided notes were used. On these tests, this student answered correctly 38%, 91%, and 86% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 72%.

Long-form guided notes. On the three bi-weekly tests in which questions came from the long-form guided notes, Student 16 correctly answered a total of 58%, 56%, and 85% of the questions for a mean score of 66%.

Summary. When Student 16 used her own notes, the bi-weekly test score mean was 35%. When guided notes were used, the mean score on the bi-weekly test was 75% with a mean of 72% for questions from short-form notes and 66% for questions from long-form notes.

Student 17

Student 17, an at-risk student, was present for all five of the bi-weekly tests.

Student’s own notes. On the first bi-weekly test in which student’s own notes were used, Student 17 correctly answered 25% of the questions. During the second bi-weekly test covering her own notes, Student 17 made a score of 15%. The mean score for Student 17 with her own notes was 20%.

Short-form guided notes. Student 17 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 25%, 45%, and 86% of the questions
over concepts/facts covered by the short-form of guided notes for a mean score of 52%.

**Long-form guided notes.** On the three bi-weekly tests in which questions came from the long-form guided notes, Student 17 correctly answered a total of 50%, 56%, and 77% of the questions for a mean score of 61%.

**Summary.** When Student 17 used her own notes, the bi-weekly test score mean was 20%. When guided notes were used, the mean score on the bi-weekly test was 62% with a mean of 52% for questions from short-form notes and 61% for questions from long-form notes.

**Student 18**

Student 18, an SLD resource student, was present for all five of the bi-weekly tests.

**Student's own notes.** On the first bi-weekly test in which student’s own notes were used, Student 18 correctly answered 15% of the questions. During the second bi-weekly test covering her own notes, Student 18 made a score of 20%. The mean score for Student 18 with her own notes was 18%.

**Short-form guided notes.** Student 18 took three bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 88%, 45%, and 71% of the questions over concepts/facts covered by the short-form of guided notes for a mean score of 68%. 
Long-form guided notes. On the three bi-weekly tests in which questions came from the long-form guided notes, Student 16 correctly answered a total of 83%, 33%, and 69% of the questions for a mean score of 62%.

Summary. When Student 16 used her own notes, the bi-weekly test score mean was 18%. When guided notes were used, the mean score on the bi-weekly test was 62% with a mean of 68% for questions from short-form notes and 62% for questions from long-form notes.

Student 19

Student 19, an at-risk student, was present for four of the five bi-weekly tests.

Student’s own notes. On the first bi-weekly test in which student’s own notes were used, Student 19 correctly answered 80% of the questions. During the second bi-weekly test covering his own notes, Student 19 made a score of 60%. The mean score for Student 19 with his own notes was 70%.

Short-form guided notes. Student 19 took two bi-weekly tests in which questions from the short-form of guided notes were used. On these tests, this student answered correctly 100% of the questions over concepts/facts covered by the short-form of guided notes.

Long-form guided notes. On the two bi-weekly tests in which questions came from the long-form guided notes,
Student 19 correctly answered a total of 89% and 100% of the questions for a mean score of 94%.

**Summary.** When Student 19 used his own notes, the bi-weekly test score mean was 70%. When guided notes were used, the mean score on the bi-weekly test was 98% with a mean of 100% for questions from short-form notes and 94% for questions from long-form notes.

**Group Summary**

Table 9 shows each student’s percent correct on bi-weekly tests when guided notes were used. Table 10 shows each student’s percent correct on bi-weekly tests by phase and condition.

**Own notes.** When taking the bi-weekly quiz over material in the students’ own notes, the mean test score for the five SLD resource students was 33.4%. The mean score for the tutored SLD students was 51.2%, and the mean test score for the at-risk students was 43.7%. This gave the class, as a whole, a mean score of 42.8% on tests when the students took their own notes.

**Short-form guided notes.** A total of 26 questions were from material covered with short-form guided notes. On these questions, the SLD resource students achieved a mean score of 71.2%. The tutored SLD students had a mean of 91% and the at-risk students had a mean of 79.1% on questions over material from short-form notes. The mean for the entire class was 79.7%. 

### Table 9

**Percent Correct on Bi-Weekly Tests during Guided Notes.**

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<th>L(12)</th>
<th>S(11)</th>
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**Notes.**  
- a = Form of notes: S indicates short, L indicates long. The number of questions is in parenthesis.  
- b = Dash indicates no data.
Table 10

Percent Correct on Bi-Weekly Tests by Phase and Condition.

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</table>

Notes. Guided notes 2 phase had 2 tests, all other phases had one test. a = Dash indicates no data. b = Based on one score only. c = Based on 2 scores only.
Long-form guided notes. On the bi-weekly tests, 34 of the questions came from material on the long-form of guided notes. The SLD resource students correctly answered a mean of 69.8% of these questions. The tutored SLD students had a mean of 87.8%, while the at-risk students achieved a mean of 81.4% on questions over material from the long-form of guided notes. The mean score for the class was 79.7%.

Summary. When students took their own notes, the resource SLD students achieved a mean score of 33.4%. Their mean score on the bi-weekly test with guided notes was 69.8%. The tutored SLD students had a mean score of 51.2% with their own notes and 89.8% with guided notes. For the at-risk students, the mean was 43.7% with their own notes and 81.8% with guided notes. The class mean when students took their own notes was 42.8%. When students used guided notes, the mean was 80.5%.

Table 11 gives a summary of the class letter grades on the bi-weekly tests. When students took their own notes and used these notes to study for the test, no students made either A’s or B’s while 14 students earned failing grades. When students used guided notes to study for the tests, nine students earned A’s, 2 earned B’s and only one earned a failing grade.
Table 11

Number of Students Earning Letter Grade Equivalents Based on Performance on Bi-Weekly Tests by Condition

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<tr>
<th>Grade</th>
<th>Own Notes</th>
<th>Guided Notes</th>
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<tr>
<td>B (80-89%)</td>
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<td>C (70-79%)</td>
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<td>E (59% and below)</td>
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Accuracy of Student Notetaking

Interobserver Agreement

Table 12 shows the percentage of interobserver agreement on daily quiz scores for each individual student by experimental phase. All of the students' own notes for two randomly selected lectures were checked by a second observer during each of the own notes phases. In each of the guided notes phases, all short-form guided notes and all long-form guided notes for two randomly selected lectures were checked by the second observer. The notes to be checked were randomly selected after completion of the study. Total agreement for individual students ranged from 94 to 100% with a group mean of 98%.

Table 13 shows the percentage of interobserver agreement on the accuracy of student notes by condition. A total percentage of interobserver agreement is reported for each student. The group range was 94-100% with a mean of 98%.

Student 1

Own notes. During the first phase in which students took their own notes, Student 1 accurately recorded a mean of 19% of the 12-14 concepts/facts presented by the teacher in each day's lecture. The range across sessions
Table 12

Percentage of Interobserver Agreement on Accuracy of Notetaking by Experimental Phase.

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Mean: 98
Range: 94-100

Note. Numbers in parentheses indicate the number of notes checked. a = Only one set of notes checked. b = Dash indicates no data.
Table 13

Percentage of Interobserver Agreement on Accuracy of Notes by Condition.

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Mean 98  
Range 94-100

Notes. Numbers in parentheses indicate number of notes checked.
was 0-92%. During the second own notes phase, the accuracy of student notes was 76.3%, with a range of 50-93%.

**Short-form guided notes.** When students were given short-form guided notes, Student 1 accurately recorded a mean of 98.8% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase. Ranges were 92-100% in the first phase and 100% in the second phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 1 correctly recorded a mean of 96% of the notes. In the second guided notes phase, Student 1 recorded all long-form notes with 100% accuracy. Ranges were 92-100% in the first phase and 100% in the second phase.

**Summary.** Student 1 accurately recorded a mean of 47.6% of the concepts/facts from the teacher’s lecture when taking her own notes. When guided notes were used, Student 1 accurately recorded 98.7% of the concepts/facts. With the short-form notes, the mean was 99.4%. With the long-form notes, the mean was 98% of the concepts/facts correctly recorded.

**Student 2**

**Own notes.** During the first phase in which students took their own notes, Student 2 accurately recorded a mean of 5.9% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions
was 0-31%. During the second own notes phase, the accuracy of student notes was 4.1%, with a range of 0-21%.

**Short-form guided notes.** When students were given short-form guided notes, Student 2 accurately recorded a mean of 91.8% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase. Ranges were 75-100% in the first phase and 100% in the second phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 2 correctly recorded a mean of 91.5% of the notes. In the second guided notes phase, Student 2 recorded the long-form notes with 98% accuracy. Ranges were 83-100% in the first phase and 92-100% in the second phase.

**Summary.** Student 2 accurately recorded a mean of 5% of the concepts/facts from the teacher’s lecture when taking her own notes. When guided notes were used, Student 2 accurately recorded 95.4% of the concepts/facts. With the short-form notes, the mean was 95.9%. With the long-form notes, the mean was 94.8% of the concepts/facts correctly recorded.

**Student 3**

**Own notes.** During the first phase in which students took their own notes, Student 3 accurately recorded a mean of 13.1% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across
sessions was 0-50%. During the second own notes phase, the accuracy of student notes was 10.5%, with a range of 0-42%.

**Short-form guided notes.** When students were given short-form guided notes, Student 3 accurately recorded a mean of 96.4% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase. Ranges were 75-100% in the first phase and 100% in the second phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 3 correctly recorded a mean of 85% of the notes. In the second guided notes phase, Student 3 recorded the long-form notes with 98% accuracy. Ranges were 50-100% in the second phase.

**Summary.** Student 3 accurately recorded a mean of 11.8% of the concepts/facts from the teacher’s lecture when taking his own notes. When guided notes were used, Student 3 accurately recorded 94.6% of the concepts/facts. With the short-form notes, the mean was 97.7%. With the long-form notes, the mean was 91.5% of the concepts/facts correctly recorded.

**Student 4**

**Own notes.** During the first phase in which students took their own notes, Student 4 accurately recorded a mean of 0.9% of the 12-14 concepts/facts presented by the
teacher in each day's lecture. The student recorded 8% of the concepts/facts for one lecture, but took no notes during any of the other lectures. During the second own notes phase, the accuracy of student notes was 32.2%, with a range of 0-75%.

Short-form guided notes. When students were given short-form guided notes, Student 4 accurately recorded a mean of 97.7% of the notes in the first guided notes phase and 96% of the notes in the second guided notes phase. Ranges were 92-100% in the first phase and 100% in the second phase.

Long-form guided notes. During the first guided notes phase when long-form guided notes were used, Student 4 correctly recorded a mean of 79.4% of the notes. In the second guided notes phase, Student 4 recorded the long-form notes with 97.3% accuracy. Ranges were 60-100% in the first phase and 92-100% in the second phase.

Summary. Student 4 accurately recorded a mean of 16.6% of the concepts/facts from the teacher's lecture when taking his own notes. When guided notes were used, Student 4 accurately recorded 92.6% of the concepts/facts. With the short-form notes, the mean was 96.8%. With the long-form notes, the mean was 88.4% of the concepts/facts correctly recorded.
**Student 5**

**Own notes.** During the first phase in which students took their own notes, Student 5 accurately recorded a mean of 11.6% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-54%. During the second own notes phase, the accuracy of student notes was 54.8%, with a range of 17-100%.

**Short-form guided notes.** When students were given short-form guided notes, Student 5 accurately recorded a mean of 97.7% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase. Ranges were 92-100% in the first phase and 100% in the second phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 5 correctly recorded a mean of 98.7% of the notes. In the second guided notes phase, Student 5 recorded the long-form notes with 96.2% accuracy. Ranges were 92-100% in the first phase and 77-100% in the second phase.

**Summary.** Student 5 accurately recorded a mean of 33.2% of the concepts/facts from the teacher’s lecture when taking her own notes. When guided notes were used, Student 5 accurately recorded 98.1% of the concepts/facts. With the short-form notes, the mean was 98.8%.
With the long-form notes, the mean was 97.4% of the concepts/facts correctly recorded.

Student 6

Own notes. During the first phase in which students took their own notes, Student 6 accurately recorded a mean of 14% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-58%. During the second own notes phase, the accuracy of student notes was 34.2%, with a range of 0-70%.

Short-form guided notes. When students were given short-form guided notes, Student 6 accurately recorded a mean of 97.5% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase. Ranges were 92-100% in the first phase and 100% in the second phase.

Long-form guided notes. During the first guided notes phase when long-form guided notes were used, Student 6 correctly recorded a mean of 98.4% of the notes. In the second guided notes phase, Student 6 recorded all long-form notes with 100% accuracy. Ranges were 92-100% in the first phase and 100% in the second phase.

Summary. Student 6 accurately recorded a mean of 24.1% of the concepts/facts from the teacher’s lecture when taking her own notes. When guided notes were used,
Student 6 accurately recorded 99% of the concepts/facts. With the short-form notes, the mean was 98.8%. With the long-form notes, the mean was 99.2% of the concepts/facts correctly recorded.

Student 7

Own notes. During the first phase in which students took their own notes, Student 7 accurately recorded a mean of 7.9% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-38%. During the second own notes phase, the accuracy of student notes was 27.6%, with a range of 0-100%.

Short-form guided notes. When students were given short-form guided notes, Student 7 accurately recorded a mean of 98.8% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase. Ranges were 92-100% in the first phase and 100% in the second phase.

Long-form guided notes. During the first guided notes phase when long-form guided notes were used, Student 7 correctly recorded a mean of 97.2% of the notes with a range of 83-100%. In the second guided notes phase, Student 7 recorded all long-form notes with 100% accuracy.

Summary. Student 7 accurately recorded a mean of 17.8% of the concepts/facts from the teacher’s lecture
when taking his own notes. When guided notes were used, Student 7 accurately recorded 99% of the concepts/facts. With the short-form notes, the mean was 99.4%. With the long-form notes, the mean was 98.6% of the concepts/facts correctly recorded.

**Student 8**

*Own notes.* During the first phase in which students took their own notes, Student 8 accurately recorded a mean of 1.7% of the 12-14 concepts/facts presented by the teacher in each day's lecture. The range across sessions was 0-15%. During the second own notes phase, the accuracy of student notes was 34.1%, with a range of 0-92%.

*Short-form guided notes.* When students were given short-form guided notes, Student 8 accurately recorded a mean of 100% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase.

*Long-form guided notes.* During the first guided notes phase when long-form guided notes were used, Student 8 correctly recorded a mean of 92% of the notes. In the second guided notes phase, Student 8 recorded the long-form notes with 88.5% accuracy. Long-form notes were recorded with 92% accuracy in the first phase. The range for the second phase was 77-100%.

**Summary.** Student 8 accurately recorded a mean of 17.9% of the concepts/facts from the teacher's lecture
when taking his own notes. When guided notes were used, Student 9 accurately recorded 95.1% of the concepts/facts. With the short-form notes, the mean was 100%. With the long-form notes, the mean was 90.2% of the concepts/facts correctly recorded.

**Student 9**

**Own notes.** During the first phase in which students took their own notes, Student 9 accurately recorded a mean of 2.7% of the 12-14 concepts/facts presented by the teacher in each day's lecture. The range across sessions was 0-8%. During the second own notes phase, the accuracy of student notes was 12%, with a range of 0-41%.

**Short-form guided notes.** When students were given short-form guided notes, Student 9 accurately recorded a mean of 100% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 9 correctly recorded a mean of 93.5% of the notes. In the second guided notes phase, Student 9 recorded the long-form notes with 98.4% accuracy. The range for the first phase was 83-100%. The second phase range was 92-100%.

**Summary.** Student 9 accurately recorded a mean of 7.4% of the concepts/facts from the teacher's lecture when taking his own notes. When guided notes were used,
Student 9 accurately recorded 98% of the concepts/facts. With the short-form notes, the mean was 100%. With the long-form notes, the mean was 96% of the concepts/facts correctly recorded.

**Student 10**

**Own notes.** During the first phase in which students took their own notes, Student 10 accurately recorded a mean of 11.6% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-31%. During the second own notes phase, the accuracy of student notes was 27.1%, with a range of 0-56%.

**Short-form guided notes.** When students were given short-form guided notes, Student 10 accurately recorded a mean of 100% of the notes in the first guided notes phase and 94.5% of the notes in the second guided notes phase. The second phase range was 67-100%.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 10 correctly recorded a mean of 98% of the notes. In the second guided notes phase, Student 10 recorded the long-form notes with 98.7% accuracy. Ranges were 92-100% in each of the two guided notes phases.

**Summary.** Student 10 accurately recorded a mean of 19.4% of the concepts/facts from the teacher’s lecture when taking his own notes. When guided notes were used,
Student 10 accurately recorded 97.8% of the concepts/facts. With the short-form notes, the mean was 97.2%. With the long-form notes, the mean was 98.4% of the concepts/facts correctly recorded.

Student 11

**Own notes.** During the first phase in which students took their own notes, Student 11 accurately recorded a mean of 0.9% of the 12-14 concepts/facts presented by the teacher in each day's lecture. The range across sessions was 0-8%. During the second own notes phase, the accuracy of student notes was 25.3%, with a range of 0-58%.

**Short-form guided notes.** When students were given short-form guided notes, Student 11 accurately recorded a mean of 100% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 11 correctly recorded a mean of 96% of the notes. In the second guided notes phase, Student 11 recorded all long-form notes with 96.2% accuracy. Ranges were 92-100% in the first phase and 77-100% in the second phase.

**Summary.** Student 11 accurately recorded a mean of 13.1% of the concepts/facts from the teacher's lecture when taking his own notes. When guided notes were used,
Student 11 accurately recorded 98% of the concepts/facts. With the short-form notes, the mean was 100%. With the long-form notes, the mean was 96.1% of the concepts/facts correctly recorded.

Student 12

**Own notes.** During the first phase in which students took their own notes, Student 12 did not take any notes. During the second own notes phase, Student 12 recorded 1.6% of the concepts/facts presented by the teacher in each day’s lecture. The range across sessions during the second phase was 0-8%.

**Short-form guided notes.** When students were given short-form guided notes, Student 12 accurately recorded a mean of 91.8% of the notes in the first guided notes phase and 95.8% of the notes in the second guided notes phase. Ranges were 67-100% in the first phase and 83-100% in the second phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 12 correctly recorded a mean of 80.3% of the notes. In the second guided notes phase, Student 12 recorded all long-form notes with 98.8% accuracy. Ranges were 31-100% in the first phase and 93-100% in the second phase.

**Summary.** Student 12 accurately recorded a mean of 0.8% of the concepts/facts from the teacher’s lecture.
when taking his or her own notes. When guided notes were used, Student 12 accurately recorded 91.7% of the concepts/facts. With the short-form notes, the mean was 93.8%. With the long-form notes, the mean was 89.6% of the concepts/facts correctly recorded.

**Student 13**

**Own notes.** During the first phase in which students took their own notes, Student 13 accurately recorded a mean of 12.3% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-46%. During the second own notes phase, the accuracy of student notes was 33.7%, with a range of 0-100%.

**Short-form guided notes.** When students were given short-form guided notes, Student 13 accurately recorded a mean of 100% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 13 correctly recorded a mean of 96.3% of the notes. The range was 86-100%. In the second guided notes phase, Student 13 recorded all long-form notes with 100% accuracy.

**Summary.** Student 13 accurately recorded a mean of 23% of the concepts/facts from the teacher’s lecture when taking his or her own notes. When guided notes were
used, Student 13 accurately recorded 99.1% of the concepts/facts. With the short-form notes, the mean was 100%. With the long-form notes, the mean was 98.2% of the concepts/facts correctly recorded.

**Student 14**

**Own notes.** During the first phase in which students took their own notes, Student 14 accurately recorded a mean of 7.1% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-23%. During the second own notes phase, the accuracy of student notes was 72.6%, with a range of 0-100%.

**Short-form guided notes.** When students were given short-form guided notes, Student 14 accurately recorded a mean of 96.4% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase. The range for the first guided notes phase was 83-100%.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 14 correctly recorded a mean of 100% of the notes. In the second guided notes phase, Student 14 recorded all long-form notes with 100% accuracy.

**Summary.** Student 14 accurately recorded a mean of 39.8% of the concepts/facts from the teacher’s lecture when taking his or her own notes. When guided notes were
used, Student 14 accurately recorded 99.1% of the concepts/facts. With the short-form notes, the mean was 98.2%. With the long-form notes, the mean was 100% of the concepts/facts correctly recorded.

Student 15

**Own notes.** During the first phase in which students took their own notes, Student 15 accurately recorded a mean of 9.2% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-83%. During the second own notes phase, the accuracy of student notes was 20%, with a range of 0-42%.

**Short-form guided notes.** When students were given short-form guided notes, Student 15 accurately recorded a mean of 100% of the notes in the first guided notes phase and 100% of the notes in the second guided notes phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 15 correctly recorded a mean of 99.5% of the notes. In the second guided notes phase, Student 15 recorded the long-form notes with 98.7% accuracy. Ranges were 92-100% in each of the guided notes phases.

**Summary.** Student 15 accurately recorded a mean of 14.6% of the concepts/facts from the teacher’s lecture when taking his or her own notes. When guided notes were used, Student 15 accurately recorded 99.6% of the concepts/facts. With the short-form notes, the mean was
187

100%. With the long-form notes, the mean was 99.1% of the concepts/facts correctly recorded.

Student 16.

Own notes. During the first phase in which students took their own notes, Student 16 accurately recorded a mean of 13.2% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-58%. During the second own notes phase, the accuracy of student notes was 17.6%, with a range of 0-38%.

Short-form guided notes. When students were given short-form guided notes, Student 16 accurately recorded a mean of 88.3% of the notes in the first guided notes phase and 97.2% of the notes in the second guided notes phase. Ranges were 62-100% in the first phase and 83-100% in the second phase.

Long-form guided notes. During the first guided notes phase when long-form guided notes were used, Student 16 correctly recorded a mean of 79.7% of the notes. In the second guided notes phase, Student 16 recorded the long-form notes with 89.3% accuracy. Ranges were 67-100% in the first phase and 69-100% in the second phase.

Summary. Student 16 accurately recorded a mean of 15.4% of the concepts/facts from the teacher’s lecture when taking his or her own notes. When guided notes were
used, Student 16 accurately recorded 88.6% of the concepts/facts. With the short-form notes, the mean was 92.8%. With the long-form notes, the mean was 84.5% of the concepts/facts correctly recorded.

**Student 17**

**Own notes.** During the first phase in which students took their own notes, Student 17 accurately recorded a mean of 11.8% of the 12-14 concepts/facts presented by the teacher in each day’s lecture. The range across sessions was 0-83%. During the second own notes phase, the accuracy of student notes was 20%, with a range of 0-47%.

**Short-form guided notes.** When students were given short-form guided notes, Student 17 accurately recorded a mean of 97.7% of the notes in the first guided notes phase and 97.2% of the notes in the second guided notes phase. Ranges were 92-100% in the first phase and 83-100% in the second phase.

**Long-form guided notes.** During the first guided notes phase when long-form guided notes were used, Student 17 correctly recorded a mean of 92.2% of the notes. In the second guided notes phase, Student 17 recorded all long-form notes with 100% accuracy. The range for the first phase was 77-100%.

**Summary.** Student 17 accurately recorded a mean of 15.9% of the concepts/facts from the teacher’s lecture
when taking his or her own notes. When guided notes were used, Student 17 accurately recorded 96.8% of the concepts/facts. With the short-form notes, the mean was 97.4%. With the long-form notes, the mean was 96.1% of the concepts/facts correctly recorded.

**Student 18**

*Own notes.* During the first phase in which students took their own notes, Student 18 accurately recorded a mean of 5.1% of the 12-14 concepts/facts presented by the teacher in each day's lecture. The range across sessions was 0-38%. During the second own notes phase, the accuracy of student notes was 35.3%, with a range of 0-71%.

*Short-form guided notes.* When students were given short-form guided notes, Student 18 accurately recorded a mean of 96.8% of the notes in the first guided notes phase and 94.7% of the notes in the second guided notes phase. Ranges were 92-100% in the first phase and 83-100% in the second phase.

*Long-form guided notes.* During the first guided notes phase when long-form guided notes were used, Student 18 correctly recorded a mean of 88% of the notes. In the second guided notes phase, Student 18 recorded the long-form notes with 88% accuracy. Ranges were 67-100% in the first phase and 67-100% in the second phase.
Summary. Student 18 accurately recorded a mean of 20.2% of the concepts/facts from the teacher’s lecture when taking his or her own notes. When guided notes were used, Student 18 accurately recorded 91.9% of the concepts/facts. With the short-form notes, the mean was 95.8%. With the long-form notes, the mean was 88% of the concepts/facts correctly recorded.

Student 19

Own notes. During the first phase in which students took their own notes, Student 19 wrote no notes. During the second own notes phase, Student 19 accurately recorded 25.1% of the concepts/facts presented by the teacher in each day’s lecture, with a range across sessions of 0-70%.

Short-form guided notes. When students were given short-form guided notes, Student 19 accurately recorded a mean of 92.8% of the notes in the first guided notes phase and 83.2% of the notes in the second guided notes phase. Ranges were 58-100% in the first phase and 16-100% in the second phase.

Long-form guided notes. During the first guided notes phase when long-form guided notes were used, Student 19 correctly recorded a mean of 81.8% of the
notes. In the second guided notes phase, Student 19 recorded long-form notes with 93.7% accuracy. Ranges were 92-100% in the first phase and 77-100% in the second phase.

**Summary.** Student 19 accurately recorded a mean of 12.6% of the concepts/facts from the teacher’s lecture when taking his own notes. When guided notes were used, Student 19 accurately recorded 87.9% of the concepts/facts. With the short-form notes, the mean was 88%. With the long-form notes, the mean was 87.8% of the concepts/facts correctly recorded.

**Group Summary**

Table 14 shows accuracy of student notes by phases. Table 15 shows accuracy of student notes by conditions.

**Own Notes.** In the first phase in which students took their own notes, five the SLD resource students accurately recorded 6.5% of the concepts/facts presented by the teacher. In this phase the four tutored SLD students correctly recorded 11.1% of the concepts/facts and the 10 at-risk students recorded 7.1% of the concepts/facts.

In the second own notes phase, the mean for resource students was 29.3%, for tutored SLD students the mean was 30.5%, and for at-risk students, the mean was 29.6%.

**Short-form guided notes.** When guided notes were used for the first time, on the short-form, SLD resource
Table 14

Percentage of Accuracy of Student Notes by Phases.

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</table>

At-Risk 7.1 97.3 94.9 29.6 98.0 98.1

Class 7.8 96.9 90.6 29.8 97.8 96.6

Note. Numbers in parentheses indicate the number of sessions in phase.
Table 15

Percentage of Accuracy of Student Notes by Conditions.

<table>
<thead>
<tr>
<th>Student Number</th>
<th>Own Notes</th>
<th>Short-Form</th>
<th>Long-Form</th>
<th>Combined Guided</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(17)</td>
<td>(13)</td>
<td>(12)</td>
<td></td>
</tr>
<tr>
<td>Resource</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>16.6</td>
<td>96.8</td>
<td>88.4</td>
<td>92.6</td>
</tr>
<tr>
<td>8</td>
<td>17.9</td>
<td>100.0</td>
<td>90.2</td>
<td>95.1</td>
</tr>
<tr>
<td>10</td>
<td>19.4</td>
<td>97.2</td>
<td>98.4</td>
<td>97.8</td>
</tr>
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<td>16</td>
<td>15.4</td>
<td>92.8</td>
<td>84.5</td>
<td>88.6</td>
</tr>
<tr>
<td>18</td>
<td>20.2</td>
<td>95.8</td>
<td>88.0</td>
<td>91.9</td>
</tr>
<tr>
<td>Resource</td>
<td>17.9</td>
<td>96.5</td>
<td>89.9</td>
<td>93.2</td>
</tr>
<tr>
<td>Tutor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>47.6</td>
<td>99.4</td>
<td>98.0</td>
<td>98.7</td>
</tr>
<tr>
<td>3</td>
<td>11.8</td>
<td>97.7</td>
<td>91.5</td>
<td>94.6</td>
</tr>
<tr>
<td>12</td>
<td>0.8</td>
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<td>89.6</td>
<td>91.7</td>
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<td>13</td>
<td>23.0</td>
<td>100.0</td>
<td>98.2</td>
<td>99.1</td>
</tr>
<tr>
<td>Tutor</td>
<td>20.8</td>
<td>97.7</td>
<td>94.3</td>
<td>96.0</td>
</tr>
<tr>
<td>At-Risk</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>5.0</td>
<td>95.9</td>
<td>94.8</td>
<td>95.4</td>
</tr>
<tr>
<td>5</td>
<td>33.2</td>
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</tr>
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<td>6</td>
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<td>99.2</td>
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<td>100.0</td>
<td>99.1</td>
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<td>19</td>
<td>12.6</td>
<td>88.0</td>
<td>87.8</td>
<td>87.9</td>
</tr>
<tr>
<td>At-Risk</td>
<td>18.4</td>
<td>97.6</td>
<td>96.5</td>
<td>97.1</td>
</tr>
<tr>
<td>Class Mean</td>
<td>19.0</td>
<td>97.3</td>
<td>93.6</td>
<td>95.4</td>
</tr>
</tbody>
</table>

Note. Numbers in parentheses indicate the number of sessions in each condition.
students accurately recorded a mean of 96.6% of the concepts/facts. The tutored SLD students accurately recorded 96.8% of the concepts/facts and the at-risk students correctly recorded 97.3% of the concepts/facts.

In the second guided notes phase, with the short-form guided notes, the SLD resource students accurately recorded 96.5% of the concepts/facts from the teacher’s lecture. The percentage of accurately recorded concepts/facts for the tutored SLD students was 98.8% and 98% for the at-risk students.

**Long-form guided notes.** In the first guided notes phase, when long-form guided notes were used, SLD resource students correctly recorded 87.4% of the concepts/facts from the lecture. The percentage for the SLD tutored students was 89.4% and for the at-risk students the accuracy percentage of the long-form notes was 94.9%.

In the second guided notes phase, the SLD resource students correctly recorded 92.5% of the concepts/facts when using the long-form guided notes. The SLD tutored students accurately recorded 99.2% and the at-risk students recorded 98.1% of the concepts/facts included in the teacher’s lecture.

**Summary.** For the class as a whole, when students took their own notes, the mean was 19%. When they used the short-form guided notes, the mean was 97.3%. With
the long-form guided notes, the class mean was 93.6% for a combined guided notes mean of 95.4% of the concepts/facts from the teacher's lecture being recorded accurately by the students.

**Student Opinion of Guided Notes**

Table 16 presents a summary of the students' opinions of each of the three methods of notetaking used in the study--own notes, short-form guided notes, and long-form guided notes. Of the 16 students who were present on the final day of the study and completed the exit questionnaire, 15 liked the short-form of guided notes best, while one student preferred taking her own notes.

Twelve of the students felt that they learned more when they took notes on the short-form guided notes. Two students thought they learned more when they used the long-form guided notes and 2 students felt that taking their own notes helped them to learn more.

Fifteen students stated that short-form guided notes produced the best quiz scores for them. One student thought her quiz scores increased when she studied her own notes. Student comments about the three notetaking methods are found in Appendix J.
Table 16

**Student Opinion of Notetaking Methods**

<table>
<thead>
<tr>
<th>Notetaking Method</th>
<th>Own Notes</th>
<th>Short-form</th>
<th>Long-form</th>
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</thead>
<tbody>
<tr>
<td><strong>Question</strong></td>
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<td></td>
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<tr>
<td>Best liked</td>
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<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Second choice</td>
<td>1</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Least liked</td>
<td>14</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Learned most</td>
<td>2</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Second choice</td>
<td>1</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Learned least</td>
<td>13</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Best quiz score</td>
<td>1</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Second best score</td>
<td>0</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Least effective</td>
<td>15</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
CHAPTER V
DISCUSSION

This study examined guided notes as a method for increasing student academic achievement. Specifically, the study focused on the amount of writing students must complete on guided lecture notes to produce increased academic achievement in social studies. Two forms of guided notes were used during the research, a long-form, on which the student wrote in phrases or sentences from the teacher's lecture, and a short-form on which the student filled in single words or a group of words in blanks on the guided notes form. This chapter presents a discussion of the results relative to the seven research questions. Also included are limitations of the study, implications for classroom practice, and suggestions for additional research.

Research Question One
Does the use of guided notes during social studies lectures result in higher scores on next-day quizzes than does a baseline condition in which students take their own notes? For each of the 19 students participating in the
study, quiz scores during the guided notes phases showed an increase over quiz scores when students took their own notes. For the class as a whole, the mean percent correct during the combined baseline phases was 51%, which represents a failing grade. During the combined guided notes phases, the class mean score increased to 81%, the grade equivalent of B-.

The daily quiz scores for the five resource room SLD students increased from a combined baseline mean of 37%, a failing grade, to 71% which is a letter grade of C-. Two of the students in this group (Students 8 and 10) improved from failing quiz performance when they took their own notes (56% and 48%) to grades of A- when the guided notes were used (90% and 92%).

One resource room student, Student 16, had a mean score of 36% when she took her own notes and a mean score of 74% with guided notes which is a grade of C. However, two of the resource students, although they earned higher quiz scores when they used guided notes, continued to earn mean scores that were in the failure range. Student 4 had a baseline mean of 18% which increased to a mean score of 48% during the guided notes phases. Student 18 went from a mean score of 25% with her own notes to a mean of 51% when
she took guided notes. For these two students, even though the use of guided notes resulted in doubling their quiz scores, it was not enough to produce a passing grade on the material covered in the skills development social studies class.

Four of the students in the skills development class were also identified as having a Specific Learning Disability but were able to function in the regular class with the aid of an SLD tutor. These students were referred to as the "tutored SLD" students. These tutored students were the only group of students in the skills development class to achieve a passing mean score when they took their own notes. As a group, the tutored students had an average score of 64% (D). Their mean score as a group increased to 89% (B+) during the guided notes phases.

Two of the tutored students, Students 1 and 12, had grades of C (74% and 77%) during the combined own notes phases. With guided notes, the mean scores of these students increased to 94% and 93% respectively, which equals letter grades of A. Student 13, who had a combined own notes mean score of 64% (D), increased this mean score to 92% (A-) when guided notes were used.

Student 3 was the only tutored student who had a failing mean score (42%) during the own notes phases. His mean quiz score, when he took guided notes, increased to 76%.
All but one of the 10 at-risk students (Student 19) had failing mean quiz scores when they took their own notes. When these students used guided notes, their group mean score increased from 53% (E) to 83% (B). Three of the at-risk students (Students 7, 9, and 14) increased their mean scores from failure (48%, 58%, and 66%) when taking their own notes to letter grades in the A range (90%, 90%, and 93%) when guided notes were used. One student, Student 19, had a C (77%) average when he took his own notes which increased to A- (92%) during the guided notes phases.

Three of the at-risk students, Students 6, 11, and 15, improved from own notes means of 50%, 58%, and 44% to means in the B range (80%, 86%, and 86% respectively) with the use of guided notes. Two of the students, Students 2 and 5 improved from own notes means of 45% and 44% to means in the C range (78% and 76% respectively) when guided notes were used.

While the use of guided notes improved the academic achievement of all 19 of the students who participated in the study, for 3 of the students, Students 4, 17, and 18, this increase was not enough to earn passing grades in the skills development social studies class. The finding that the use of guided notes increases academic achievement as measured by daily quiz scores is consistent with the results of other studies (Heward et al., 1987; Kline, 1986; Pados, 1989; Virgalitte, 1988; Yang, 1988).
Research Question Two

Does the use of short- and long-form guided notes during social studies lectures produce differential levels of scores on next-day quizzes? Only two students, Students 8 and 9, earned mean scores with one form of guided notes that were more than 10% greater than their score produced with the other form. The mean scores for both of these students were 82% with the short-form guided notes; whereas, the long form of guided notes produced means of 97% and 96%. For these two students, the long form of guided notes produced improved quiz scores.

For Students 4, 5, and 11, the form of guided notes used had no effect of the daily achievement quiz scores. Student 4 had a mean score of 48%, Student 5's mean was 76%, and Student 11 had a mean score of 88% with both the short-form and long-form of guided notes.

Of the remaining 14 students, 3 students (Students 1, 6, and 7) had slightly better scores with the short form of guided notes. The mean scores of these students were 93%, 78%, and 88% with long-form guided notes which increased to means of 94%, 81%, and 92% when the short form was used.

Eleven of the students scored slightly better with the long form of guided notes. This increase was from 7%, for Students 16 and 18 who went from 70% and 47% with short-form guided notes to 77% and 54% when long-form guided notes were used, to a 1% increase for Students 3 and
17 who went from 58% and 75% with short-form notes to 56% and 76% with long-form guided notes.

The greatest difference was seen in the mean scores of the resource students whose mean scores were 67% with the short-form guided notes as compared to 74% when the long-form guided notes were used. This is a difference of 7 percentage points in favor of the long-form guided notes.

The tutored SLD students had a mean score of 88% with short-form guided notes compared to 90% with the long-form notes. This was a difference of only 2 percentage points. The at-risk students had an even smaller difference. The mean score with short-form notes was 83%. With the long-form notes the mean increased to 84% for the at-risk students.

For the class as a whole there was only 4 percentage points difference in the two types of guided notes with the short-form guided notes producing a mean score of 79%, whereas, the long-form guided notes mean was 83%.

The form of guided notes used did not produce significantly different levels of daily quiz scores for 17 of the 19 students. For the students in this study, the critical variable was the use of guided notes. The form of these guided notes, whether short-form or long-form, seems to be of minor importance in increasing quiz scores. Although quiz scores were slightly higher for 14 of the 19
students with the long-form guided notes the differences were very small.

Research Question Three

Which of the three methods of notetaking--student's own notes, short-form guided notes, or long-form guided notes--produce the highest scores on bi-weekly social studies tests? The bi-weekly test, given on Monday after two weeks of instruction was made of 30 items, however, 10 of these were counted as a daily quiz score. The remaining 20 items were considered to be the bi-weekly test. Each bi-weekly section of the test contained 10 recognition items (multiple choice with 4 possible answers) and 10 recall items (short answer/fill-in-the-blank). At least one recognition and 1 recall item was taken from each of the daily quizzes administered during the two-week period. The 10 questions for the daily quiz were included in the bi-weekly test so the student was required to respond to a total of 30 items.

Students were given 5 minutes to study on days the bi-weekly test was administered. They were told when 3 minutes were up so that they could pace their studies. The experimenter was unable to determine how individual students studied during this period, i.e., whether they spent more of their time studying for the daily quiz or if more of the time was spent in review. Two or 3 minutes is not much time to review material for an entire two weeks.
Because these were students who had trouble keeping up with materials, only the notes for the two weeks that were to be studied were in their notebooks. Notes were removed from student notebooks after the bi-weekly test. Although students had a special notebook and were told each day to place their notes in that notebook, Students 8 and 11 sometimes lost their notes before the two weeks were over and were missing some of the notes that they needed to study for the bi-weekly test.

In looking at data for the SLD resource students, the mean score on the bi-weekly test was 33% when the students took their own notes as compared with 70% when guided notes were used. There was very little difference in the form of guided notes used. The mean score was 71% with short-form and 70% with long-form guided notes.

Only one student, Student 8, had a passing mean score (62%) on the bi-weekly test when he took his own notes. When guided notes were used, only one SLD resource student continued to have a failing score. This was Student 4 whose mean bi-weekly test score was 10% when he took his own notes and 25% with guided notes. Student 18’s mean score on bi-weekly tests increased from 18% when she took her own notes to 62% (D) with guided notes. The improvement for resource Students 8 and 10 was more impressive. The mean scores of these students increased
from 62% (D) and 42% (E) when they took their own notes to 92 (A-) and 95 (A) with the use of guided notes.

The bi-weekly test score mean for tutored SLD students was 51% when they took their own notes and 90% with guided notes. Again, there was little difference in test scores when looking at the form of guided notes used. The mean score was 88% with the long-form guided notes and 91% with short-form notes. Students 12 and 13 scored passing grades when they took their own notes. Their mean scores were 70% (C) and 60% (D) with their own notes. These scores increased to means of 92% (A) and 100% (A) when guided notes were used. The two students with failing mean scores of 55% and 20% on the bi-weekly test, Students 1 and 3, had means of 95% (A) and 72% (C) with guided notes. Student 3 was not in the classroom the day the first bi-weekly test was administered which gave him only one test score when he took his own notes.

The 10 at-risk students had a mean score of 44% (E) on the bi-weekly quiz when they took their own notes compared to a mean of 82% (B-) when they used guided notes. There was very little difference in mean test scores depending on the form of guided notes used. The group mean was 79% with short-form notes and 81% with long-form notes. One of the at-risk students, Student 19, had a mean score of 70% (C) when taking his own notes. This mean increased to 98% (A) when he used guided notes. Student 14 also had a passing
mean score, 62% (D-), when he took his own notes. This mean increased to 95% (A) when he used guided notes.

The remaining eight at-risk students had failing mean scores with a range of 10-58% when they took their own notes. All of these students achieved passing mean scores when guided notes were used, although for Students 2 and 17 with means of 60% and 62% these means were barely passing. Two of the at-risk students, Students 5 and 6, had means in the C range with scores of 75% and 72% when they used guided notes. Two students, Students 11 and 15, had means of 88% (B+) when using guided notes.

Over all, when the at-risk students took their own notes, there were no A’s or B’s on the bi-weekly test. There was 1 C, 1 D, and 8 failures. When guided notes were used by the at-risk students, scores on bi-weekly quizzes increased to 4 A’s, 2 B’s, 3 C’s, 4 D’s, and no failures.

For the skills development class as a whole the mean score on the bi-weekly test increased from 43% (E) to 80% (B-) when guided notes were used. The letter grades of 18 of the 19 students increased at least one letter. Three students, Students 2, 17, and 18, had improvement of one letter grade. Six students, Students 3, 5, 6, 12, 16, and 19, increased their mean score by two letter grades. Five students increased their mean bi-weekly test scores by three letter grades. These were Students 8, 11, 13, 14, and 15. Four students, Students 1, 7, 9, and 10,
their mean scores on the bi-weekly tests by four letter grades when they used guided notes.

From these data, higher scores on bi-weekly tests were earned when students used guided notes. There was almost no difference in bi-weekly test scores based upon the form of guided notes used with a mean of 79.5% with short-form notes and 79.7% with long-form guided notes.

**Research Question Four**

Do students accurately record a larger percentage of concepts/facts when guided notes are used than they record when taking their own notes? Each of the 19 students involved in this study recorded a significantly larger percentage of concepts/facts when they used guided notes than they did when they took their own notes. The students enjoyed using the guided notes and during the second phase when they were taking their own notes, several of them frequently asked when they could use guided notes again.

The SLD resource students recorded a mean of 17.9% of the lecture concepts/facts when they took their own notes as compared with 93.2% when they used guided notes. These SLD resource students recorded more correct information on the short-form guided notes, 96.5%, than they did with long-form guided notes, 89.9%.

The tutored SLD students recorded only 20.8% of the lecture concepts/facts when they took their own notes as compared to 96% when they used guided notes. This group of
tutored SLD students also recorded slightly more correct information when they used the short-form guided notes, 97.7%, than they recorded on long-form guided notes, 94.3%.

The at-risk students recorded a mean of 18.4% of the important information from the lecture when they took their own notes as compared to 97.1% when they used guided notes. The short-form guided notes again produced a higher percentage of accuracy, 97.6%, as compared to 96.5% with the long-form guided notes.

The class, as a group, recorded a mean of 19% of the lecture concepts/facts when they took their own notes as compared with 95.4% when they used guided notes. Guided notes quite clearly gave the students access to a larger amount of accurate information to use in studying for the daily quizzes and bi-weekly tests. The form these guided notes took was not that important as far as percentage of accuracy of notetaking is concerned. Students did record slightly more accurate information at 97.3% for short-form guided notes as compared to 93.6% of the information when they used the long-form guided notes.

At the beginning of the second guided notes phase, the teacher announced that students who recorded 100% of the information accurately on their guided notes would earn 1/2 a bonus point for each set of notes. This had very little effect on the percentage of short-form guided notes recorded in the second phase because students were already
recording a mean of over 96% on the short-form guided notes. It may account for the increase in accuracy of long-form guided notes which increased from a class mean of 90.6% in the first guided notes phase to a class mean of 96.6% in the second phase.

**Research Question Five**

**Does the use of guided notes result in improved student notetaking when the guided notes are removed?** For some students, the use of guided notes did result in improved student notetaking when the guided notes were removed. In preparation for student notetaking, each student had on his desk a sheet of lined notebook paper on which the experimenter had written the student’s name and the lecture number. On the first day of the students taking their own notes after the guided notes were withdrawn, only 3 students took any notes. Students who took their own notes were Student 1 who recorded 57% of the key concepts/facts from the lecture, Student 5 who recorded 35% of the concepts/facts, and Student 13 who recorded 28% of the facts/concepts. During the 3-minute study period the following day, students made comments that indicated they realized that they had nothing to study for the quiz. During the second lecture, all students except Student 12 and Student 16 took notes. The class mean for Lecture 24, which was the second lecture in the second own notes phase, for the percentage of important concepts/facts recorded was
64.1%. The range for the students who recorded notes was 14% recorded by both Student 3 and Student 4 to 100% recorded by Student 14.

On the third day of baseline, Lecture 25, all except Student 2 took some notes. Three of the students, Students 7, 8, and 12, recorded only one concept/fact correctly, while Student 14 again recorded 100% of the concepts/facts from the lecture. The class mean for recorded concepts/facts was 41.5%.

Lecture 26, the fourth day of baseline, was the day the students returned from Christmas Holidays. Seven of the students did not take any notes over this lecture. The class mean was 14.8% with the range of those students who did take notes going from 7% to 50%.

Because students had so few notes to study during the 3-minute study period the following day, all but three students, Students 3, 9, and 17, took some notes. The class mean was 42.8% with Students 5, 7, 13, and 14 writing 100% of the concepts/facts in their notes. On this day and the two following days, students began asking for guided notes again. Students 13, 17, and 18 commented that they liked guided notes better than taking their own notes.

Lecture 28 was the next to the last day of baseline. Four students, Students 2, 3, 6, and 19, did not take any notes. The class mean was 31.7% with a range of 8-75% for students who did take notes.
On the final day of students taking their own notes, five students, Students 2, 7, 9, 12, and 19 did not take any notes. The class mean was 23.9% with the range for students who did take notes being 8-100%.

During the second own notes phase which covered Lectures 23-29, all students took some notes at least once. Two students, Students 1 and 5, took notes during each session with a mean of 76.3% and 54.8% respectively. Student 14, who did not take notes the first day of the second own notes, took notes on all the remaining lectures for a mean of 72.6% of all main concepts/facts accurately recorded. The class mean for the second own notes phase was 29.6%. The range during this phase was 1.6-76.3%. This can be compared to the first own notes phase in which the class mean was 7.8% with a range for students who took notes of 0.9-19%. Students 12 and 19 never took notes during the first own notes phase. Although given notebook paper and reminded to take notes on Lectures 2, 3, 7, and 8 not a single student took any notes.

Possibly, since these students were accustomed to making low grades, or they were not concerned about their grades since they were told that the grades would not count, they did not see the need of having notes to study.

From comments made by the students, some of the students realized that they made better on quizzes if they had notes to study and some of them, Students 1, 5, 8, 10,
14, 15, 16, and 18 took notes consistently after the first or second session in the return to own notes. Comments from the students indicated that they liked making the higher grades which they had earned during the first guided notes phase and they wanted to continue making high grades.

While some students, such as Students 1 and 14 recorded a mean of over 70% correct concepts/facts from the lectures, the other students, although they took notes were unable to focus on the main ideas and sometimes wrote down irrelevant material, recorded the concepts/facts incorrectly, or simply failed to record the main ideas.

The use of guided notes did increase the class mean of the percentage of correct concepts/facts recorded in student notes from 7.8% to 29.6% which was an increase of 21.8%. It is not known how much formal training in notetaking strategies the students in this study had received; however, because so many students were attempting to take notes during the second baseline phase, they would probably be interested in learning more about how to take good notes and some of them would probably use these strategies for notetaking in other classes.

Research Question Six

How long does it take to prepare the two types of guided notes? A record was kept on the amount of time required for preparing the guided notes. The time required
for preparation of the short-form ranged from a low of 8 minutes to a high of 24 minutes with a mean of 16.8 minutes. One time-saver in the preparation of the short-form notes for this particular group of students was that the experimenter was able to use the lecture outline that was already on the computer and cut-and-paste so that the entire set of guided notes did not have to be completely retyped.

The time required for typing the long-form guided notes ranged from 7-21 minutes with a mean of 14.5 minutes. When you consider that a content area teacher might be teaching several classes during the day and could use the same notes or the notes with slight modifications, about 15 minutes spent typing the guided notes does not seem time consuming, especially, since the notes could be used with classes in future years.

Research Question Seven

What are students' preferences and opinions regarding the three methods of notetaking used in this study? For all but one of the 16 students in the skills development social studies class who were present when the exit questionnaire was administered, short-form guided notes was the preferred method of notetaking. Student 16 reported that she liked taking her own notes better. For the first two days in the second own notes phase, Student 16 took no notes. The largest percentage of correctly recorded
concepts/facts in that phase for Student 16 was 38% on the third day when she started taking her own notes. The mean of correctly recorded concepts/facts for Student 16 when she took her own notes was 15.4%.

Students said that they liked the short-form guided notes because they were easy to follow and you only had to fill in missing words. Some students said that the short-form notes made them listen more carefully and that they kept them from missing important information. One student said that the short-form notes were easier to study from and another said that they kept him from getting lost during the lecture. Several students indicated during the study that they liked the short-form better because they did not have to write as much. Twelve of the 19 students said that they thought they learned more when they studied the short-form guided notes.

In response to the question of what they did not like about short-form notes, 10 of the students could find nothing that they disliked about the short-form notes. One student said they were boring, another said that he got confused. One student commented that you really had to listen when using them and another replied that the answers were too long.

Although no students reported that they liked the long-form guided notes better, 13 of the students considered it the second best method of taking notes in
class. When asked what they liked about the long-form notes one student gave no response and nine students replied that they did not like the long-form notes. One student liked the way they were filled in, a second student said that they made him listen more, another student said that they were easier to study, and a final student said that if you missed out on some of the information during the lecture, you could add it when the teacher used the lecture transparency at the end of the class period.

The majority of the students indicated that the things they disliked most about the long-form guided notes were that they required more writing and took so much longer to complete. Three students indicated that the long-form notes were harder to follow. Another student said that the long-form notes gave you too much material to study in 3 minutes. This lack of sufficient study time should not be a problem for students not participating in a study as the teacher should encourage the students to take their notes home for study each night.

Fourteen of the students selected taking their own notes as the least preferred method of notetaking. Three selected long-form notes as the least liked. No student selected short-form notes as least liked.

Twelve of the students believed they learned more with the short-form notes. Two students thought they learned more with long-form notes and two students reported that
they thought they learned more when they took their own notes. Fifteen students thought that short-form notes produced the better quiz scores for them. One student thought that his own notes produced the best quiz scores. No student thought that long-form notes produced the best quiz scores. Actually, for 12 of the 19 students, the long-form guided notes produced slightly higher quiz scores. Three students had identical mean scores with both forms of guided notes and four students did score slightly higher with the short-form guided notes.

When asked how the guided notes could be changed to help them learn more, one student said that the long-form notes should have less space for responses. That is a good point. Because some of the SLD students in this study had poor handwriting skills, the experimenter left more space in order that these students would have room to write using the larger letters that they normally use for writing. Some students thought that because the space was there, it needed to be filled in with their writing. Cutting down on the space is a helpful suggestion in that long-form notes usually required three sheets of paper, whereas, the short-form notes were always two pages long. For teachers with limits on the amount of paper they can use for duplication of materials, less space for the long-form answers might make it possible to get these notes on two pages which
would be a considerable savings in paper over a year's time.

Students were extremely positive in their responses to the use of guided notes. Many of them said that they saw no way the notes could be improved, that they were perfect the way they were. Typical comments were, "I think they were great! There is nothing I would change, I learned a lots, thanks!", "I don't see how you could change them, they're wonderful!", and "They helped me learn more."

On the last day of the study, several students came over to the experimenter and thanked her for making the guided notes. Some of the students said that they wished they could have guided notes all of the time.

The experimenter never heard a negative comment from a student about the use of guided notes. The student who wrote that the notes were boring was one of the students who came over and said that he wished he could have guided notes all year. Additionally, no student ever voiced a complaint about taking the daily quizzes. They appeared to enjoy taking them and several of them raced to see who could earn the most 10's during the study.

For the students involved in this study, short-form guided notes were their first choice, long-form notes were second, with taking their own notes the least preferred method of notetaking.
Limitations

This study was limited by the following factors: subject characteristics, teacher characteristics, absences, varying difficulty of curriculum content, the setting and time of school year, and the time of the school day.

Subject Characteristics

The subjects in this study were 19 students identified as learning disabled or at-risk. With the exception of one hispanic student, all students were caucasian. The middle school, in which the study was conducted, was located in an affluent neighborhood. It is not known to what extent the generality of the effect of guided notes on academic achievement would be across students of different age and skill levels, of different races, and of different socioeconomic levels.

Teacher Characteristics

The social studies teacher in whose classroom the study was conducted was an experienced social studies teacher with a Ph.D. She seldom taught using the lecture method prior to this study. Results might have been different with a teacher who was accustomed to teaching by lecturing.

Absences

While student attendance was good during the first three phases of the study, flu hit the school during the final phase and many students missed several days of
class. On one day only 10 of the 19 students were present. It is not known to what extent the results would have differed had students been present for all sessions of the study.

**Varying Difficulty of Curriculum Content**

While the experimenter tried to keep the difficulty level of the individual lessons constant, there was some variability. The fact that guided notes were used with televised news reports, visiting speakers, filmstrips, lessons on writing bibliographies, and lessons from handouts, as well as lessons from the textbook meant that some lessons were more difficult for some students than for others. Had all lessons been from the same textbook, it would have been easier to keep the difficulty level more nearly constant.

**The Setting and Time of School Year**

The setting was a suburban middle school classroom for learning disabled and at-risk seventh-graders. Results might be different with other populations and in other academic environments.

When the study was started, the students were busy working on individual projects for the school's History Fair. Initially, several sessions were missed because students were in the library doing research for their projects during ninth period. During the week of the Fair, students participated in the study for only one day.
Students were also out for Thanksgiving and later Christmas holidays during the study. To what extent these breaks in the study influenced the outcome is unknown.

**Time of School Day**

The class met ninth period which was the last period of the school day. Students were often tired when they attended this class. Also events that happened prior to this class sometimes carried over into the classroom. One day students had trouble settling down to work because they thought that a friend had just been suspended from school. Another time they came to ninth period from a school assembly program and wanted to talk about it rather than study. Results might have been different had the class met at another time, such as early in the morning.

**Implications for Classroom Practice**

Because of the data collection needs of the study, student notes were taken up at the end of the class period and returned to the student at the beginning of the class period on the following school day. For this reason, students did not have access to their notes for homework study. Teachers using the guided notes strategy should encourage the students to take their notes home and study them. Fisher and Harris (1973) found that taking good notes and then reviewing the notes led to more efficient recall.
For the three students in this study who still earned failing grades even with the use of guided notes (Students 4, 17, and 18), the data revealed that they were accurately recording a mean of over 90% of the facts/concepts from the teacher's lecture. Even though the students were accurately recording the concepts/facts from the lecture, they may have needed more time to study their notes.

These three students who had the lowest quiz scores were seldom seen studying their notes during the 3-minute study period. They often did not even open their notebooks during the study period. For students who do not know how to study on their own or for students who need more exposure to the material, the students could be encouraged to take their notes to the resource room teacher who could spend 10 to 15 minutes a day reviewing these notes with the students. A sample review procedure that the resource room teacher could use is provided in Appendix L.

Choral responding and individual questioning provide each student with several opportunities to actively respond to each question increasing the probability that the student would remember the information when quizzed on it later in the regular class. The resource room teacher or an SLD tutor reviewing guided notes with the student would be one way in which these special educators could help mildly handicapped students increase their academic achievement in content area classes.
The classroom teacher commented that preparing the lecture outline took too much time. Because this was not one of the variables considered in the study, the researcher had not been recording the lecture outline preparation time. From that point on, lecture preparation time was recorded.

Sometimes the lecture outline was composed at the computer which was faster than writing the outline in longhand and then typing it; however there were days when the experimenter did not have access to a computer but did have time to work on lecture outlines. On those days the outline was written and typed later. This is probably typical of the classroom teacher who might write out a lecture outline during a class planning period and type it that night when she or he returned home.

Teachers who have previously taught the subject matter to be included in the lecture outline would no doubt complete the lecture outlines in less time than did the researcher who was unfamiliar with the material being taught. The time required for preparation of lectures 20-41 ranged from 16 to 57 minutes. These were the lectures for the last half of the study. The lectures prepared during the first half probably took longer as the researcher spent a great deal of time, initially, trying to get the difficulty level of the lectures equivalent. By Lecture 20, lecture preparation had become more routine and
was less time consuming. The mean for preparation of the lecture outline was 43 minutes per lecture.

While the first time that the lecture is taught requires a considerable expenditure of teacher preparation time, the teacher has a permanent product, a lecture outline, to keep him or her on task. This outline, when saved on the computer, can be easily modified for use with future classes. With a lecture outline, the teacher can keep an account of the concepts/facts covered in each lecture and can plan so that all necessary material is covered during the school year.

An advantage of the lecture outlines used during this study was that students in the skills development class who were absent during a lecture could go to the social studies classroom during their flex period to make up missed assignments. The teacher gave them the lecture outline to read and to take notes from. This freed the social studies teacher from having to re-deliver the lecture and enabled the students to get the main concepts/facts that they had missed. The teacher had to answer only questions about items on the lecture outline that the student did not understand.

The lecture outlines used in this study were produced on a microcomputer and enlarged 155%. They were then made into transparencies which were used by the teacher, with progressive disclosure, in the presentation of the
lecture. The time required for enlarging a typical lecture outline was 1/2 minute. Copying the outline onto transparencies averaged 1 1/2 minutes per lecture. This included uncovering the machine, getting the transparencies from the box, running them through the Thermo-Fax machine, and recovering the machine afterward.

As to the form the guided notes should take, this is a decision that should be made by the individual teacher based on his or her teaching style and the needs of the students involved.

An additional finding of this study was that guided notes can be effective when used with differing formats of instruction. On Fridays, guided notes were used as students watched a news program. The program was taped and viewed by the teacher and experimenter the day before it was shown to the students. This gave time for preparation of the lecture outline and guided notes. The teacher was able to tell students what to look and listen for in the program.

Guided notes were also used with a visiting speaker. Students each wrote out several questions that they would like to ask the speaker. The speaker was given the questions and briefly discussed his responses with the experimenter who was able to make a lecture outline and guided notes for the session. The students found the
guided notes helpful in determining what questions to ask the speaker.

Additionally, guided notes were effective when used while students viewed filmstrips and for lessons taken from handouts on topics such as Africa, the election, the History Fair, and facts about the state of Ohio.

**Suggestions for Additional Research**

This study involved only at-risk and learning disabled students in a suburban middle-school. The Kline (1986) study involved only learning disabled high school students. While Yang (1988) looked at the effects of guided notes on middle-school students in a mainstreamed science class, to date, no study of the use of guided notes has been conducted on the secondary level with mainstream students. For the students involved in this study, the use of guided notes resulted in improved performance on the bi-weekly tests which were administered at two-week intervals. Future studies could look at maintenance on the secondary level.

Since secondary students are expected to remember information for six-weeks, quarterly, or semester tests, a future study could involve weekly, rather than daily, quizzes and tests at the end of the grading periods.

There is a need to investigate the use of guided notes with developmentally handicapped and with behavior disordered students on the elementary, middle school, and
high school levels. Another avenue of research would be to look at the effect of having the resource teacher spend 10-15 minutes a day reviewing, with the students, the notes that they take in their regular classes. Studies of the review of notes by the resource room teacher could be conducted using students who are developmentally handicapped, behavior disordered, as well as students with specific learning disabilities.

Summary

The purpose of this study was to examine academic achievement as measured by 10-item quizzes over social studies lectures presented the previous school session when students (a) took their own notes; (b) used short-form guided notes that required filling in a word or groups of words in blanks; and (c) filled in long-form guided notes which required phrases or complete sentences to record the concepts/facts from the lecture.

The primary dependent variable in the study was academic achievement as measured by the scores on daily quizzes. Maintenance of achievement was measured by bi-weekly tests.

Guided notes are a relatively inexpensive, in terms of both time and money, method of increasing active student responding and improving academic achievement as measured by test scores. Because the guided notes are completed in advance, the teacher arrives in the classroom well prepared
with a lecture that is logically organized. The notes guide the student through the lecture and allow the student to focus on important points.

Results indicate that quiz scores for all 19 students were higher during the guided notes phases than during either of the phases in which students took their own notes. The form of the guided notes was a relatively unimportant variable in this study. For 12 of the 19 students, long-form guided notes produced slightly higher scores on daily quizzes. Only students 8 and 9 scored more than 10% higher with long-form guided notes. Short-form guided notes produced slightly higher daily quiz scores for four students. For three of the students, the form of guided notes made no difference. Their mean quiz scores were identical for both forms of guided notes.

Guided notes increased maintenance of academic achievement as measured by scores on bi-weekly tests. All 19 students in the study had a higher mean score on bi-weekly tests during guided notes phases. On bi-weekly tests, the class mean scores were identical for both forms of guided notes.

During the second phase in which students took their own notes, the percentage of accurately recorded concepts/facts recorded in the students' notes increased for 17 of the 19 students. Students made comments that
indicated they realized that they needed notes to study in order to make higher scores on their quizzes.

Finally, the students liked taking guided notes. They felt the guided notes helped them to listen better, pointed out the main ideas of the lecture, and gave them good information to study for quizzes. When the handicapped student is required to take his own notes, he often misses important concepts/facts. The use of guided notes by all students in the class would give the learning disabled and at-risk student in the regular classroom access to the same information for study as his nonhandicapped peers. Guided notes are a relatively inexpensive method of giving the student increased opportunity to make active responses during lecture situations and of increasing academic achievement as measured by test scores.
LIST OF REFERENCES


Heron, T. E., & Harris, K. C. (1987). *The educational consultant: Helping professionals, parents, and mainstreamed students* (2nd ed.). Austin, TX: PRO ED.

Heward, W. L., Cooke, N. L., & Test, D. W. (1987). Strategies and tactics for increasing the level of active student response during group instruction. (Student guided notes for 772). Columbus: The Ohio State University, Department of Human Services Education.


APPENDIX A

PARENTAL CONSENT FORM AND LETTER
I agree to allow my child to participate in a research study investigating the effectiveness of an instructional strategy, guided notes, as a method for increasing academic achievement. This study will be conducted in the ninth period social studies class by Frances Courson, under the direction of Dr. William L. Heward, Professor of Special Education, The Ohio State University, and will begin on November 2, 1988. The study will conclude in January, 1989.

I understand that my child’s identity will not be revealed in any publication, document, recording, videotape, photograph, computer storage, or any other form of report developed from this research. I also understand that I may withdraw my consent for my child’s participation at any time.

Name of Student

________________________________________
Signature of Parent or Guardian Date

________________________________________
Principal Date

________________________________________
Social Studies Teacher Date

________________________________________
Resource Teacher Date

________________________________________
Investigator Date
October 27, 1988

Dear Parents,

Students in Skills Development Social Studies 7 have been working very hard this quarter on recording assignments in their plan book, completing assignments on time, organizing materials and notebooks, and behaving appropriately during class.

During the second grading period, emphasis will be placed on listening skills and notetaking. Students will be provided with a guided outline containing incomplete sentences about the topic presented in class. The students are to listen carefully for the missing information and record on the guided outline. Quizzes and tests will be based on the notes taken during class.

The Social Studies teachers are working with an Ohio State University doctoral student who is writing a dissertation on the use of guided notes to improve retention of academic material, improve test scores, and, hopefully, to promote notetaking in other classes as well as in Social Studies.

Please sign and return the Ohio State University participation permission form by Monday, October 31.

Sincerely,

________________________________________
Principal

________________________________________
Social Studies Teacher

________________________________________
Resource Teacher

________________________________________
Doctoral Student
APPENDIX B

INSTRUCTIONAL TRANSPARENCY
1. Water is a valuable resource in the dry lands of East and North Africa.

2. Zaire supplies most of the industrial diamonds used throughout the world.

3. The animal life is a resource of East and Equatorial Africa.

4. The animals are also a great tourist attraction.

5. Two important mountains of East Africa are Mount Kilimanjaro and Mount Kenya.

6. Most of the world's cloves, a spice of high value, come from Tanzania.

7. A serious problem in East Africa is the presence of diseases such as malaria, sleeping sickness, and AIDS.

8. Another problem in East Africa is the need for education.

9. Waterfalls of the rivers are important sources of hydroelectric power.

10. When African Kingdoms were taken over by Europeans, this was called the colonial period.

11. This colonial period was a painful time for these Africans because their government and culture were taken away from them.

12. Exploitation happened when foreign companies took products from Africa at a large profit for themselves leaving little for the people of Africa.

13. Most of the countries of East and Equatorial Africa were colonies of European countries until the 1960's.
APPENDIX C

LONG-FORM GUIDED NOTES
Guided Notes 30

Name ____________________________

1. A valuable resource in the dry lands of East and North Africa is:

   *

2. Zaire supplies most of what product?

   *

3. A resource of East and Equatorial Africa is:

   *

4. What is a great African tourist attraction?

   *
5. Two important mountains of East Africa are:

6. What important spice comes from Tanzania?

7. What is a serious problem in East Africa?

8. Another problem in East Africa is:
9. What are important sources of hydroelectric power?

* 

10. The Colonial Period was:

* 

11. Why was the colonial period painful?

* 

12. What is exploitation?

* 

13. Most of the countries of East and Equatorial Africa were colonies of European countries until what date?

*
APPENDIX D

SHORT-FORM GUIDED NOTES
1. The __________________________ covers most of Southern Africa.

2. The ______________ and the ______________ are desert-like areas in Southern Africa.

3. The upper grasslands of Southern Africa are called the ________________________________.

4. The High Veld is similar to the ___________________ in the United States.

5. Three main rivers of Southern Africa are the ___________ River, the ___________ River, and the ___________ River.

6. The Zambezi River is a source of ___________________
7. South Africa is the world’s leading supplier of ___________ and _________________.

8. The Boers were early _________________ settlers in South Africa.

9. _________________, the forced separation of nonwhites and whites, is practiced in South Africa.

10. _________________ is the idea that black Africans ought to control their nation.

11. A _________________ is a country under the control of another country. It is expected to become an _________________ country after a period of time.

12. In 1980, Southern Rhodesia was renamed Zimbabwe which was the name of an old _________________.

APPENDIX E

DAILY QUIZ
Recall 31

Name ________________________________ Score __________

Circle the letter before the best answer.

1. The Boers were:
   a. early Dutch settlers in South Africa.
   b. members of an old African Kingdom.
   c. early French settlers in Zimbabwe.
   d. the upper grasslands of Southern Africa.

2. The forced separation of nonwhites and whites is called:
   a. a protectorate.
   b. colonization.
   c. apartheid
   d. Black Nationalism.

3. The idea that black Africans ought to control their nation is known as:
   a. a protectorate.
   b. colonization.
   c. apartheid
   d. Black Nationalism.

4. Southern Rhodesia was renamed Zimbabwe which was the name of:
   a. an old African kingdom.
   b. a famous African warrior.
   c. a famous African doctor.
   d. a wealthy African headhunter.

5. Three main rivers of Southern Africa are the:
   a. Nile, Victoria, and Rhodesia.
   b. Orange, Limpopo, and Zambezi.
   c. Nambib, Kalahari, and High Veld.
   d. Great Rift, Blue Nile, and White Nile.
Fill in the blanks with the answers that best complete the sentences.

6. The __________________ Plateau covers most of Southern Africa.

7. The High Veld is similar to the Great ____________ in the United States.

8. The Zambezi River is a source of ____________ power.

9. South Africa is the world's leading supplier of gold and ____________________.

10. A protectorate is expected to become an __________________ country after a period of time.
APPENDIX F

BI-WEEKLY TEST
Circle the letter before the best answer.

1. Gorbachev’s visit to New York City caused:
   a. the United Nations to give him an award.
   b. the amount of garbage collected by the city to double.
   c. the subway system to be shut down for security reasons.
   d. the biggest traffic tie-ups in the city’s history.

2. Gorbachev, in his speech to the United Nations announced that the USSR will:
   a. help the starving people in Ethiopia.
   b. launch a new spy satellite.
   c. make promised electoral reforms.
   d. reduce its non-nuclear weapons and army.

3. The President has said that he:
   a. will soon pardon Oliver North.
   b. has no intention of pardoning Oliver North.
   c. will give North the documents he needs for his trial.
   d. will let Bush make all decisions concerning Oliver North.

4. The best solution to the garbage problem would be:
   a. burying it in landfills.
   b. dumping all garbage in the oceans.
   c. using only glass containers.
   d. recycling the garbage.

5. Ethiopia has had near perfect rainfall this year and as a result has had:
   a. many floods along major rivers.
   b. a severe famine.
   c. its best harvest in 25 years.
   d. a problem of what to do with its garbage.
6. The largest country in North Africa is:
   a. Algeria.
   b. Egypt.
   c. Morocco
   d. Tunisia.

7. In size, Africa is:
   a. more than 5 times the size of Europe.
   b. the largest continent.
   c. the second largest continent.
   d. the only continent larger than Europe.

8. The Mesopotamian cities may have been:
   a. the first cities in the world.
   b. the largest cities in the world.
   c. destroyed by floods of the Nile.
   d. built by people from South America.

9. The United States is being severely criticized because:
   a. it will not allow the PLO leader to come to the United States.
   b. it made Mandela a political prisoner.
   c. it has made a decision about how much oil to produce.
   d. it has built a new bomber.

10. Students in East Harlem are happy and have a desire to learn because:
    a. East Harlem has built many new and modern schools.
    b. the students may choose their teachers.
    c. the students may choose the school they will attend.
    d. the students attend school in their neighborhood.

11. A famous quotation from John F. Kennedy is:
    a. "Give me liberty or give me death."
    b. "Ask not what your country can do for you, ask what you can do for your country."
    c. "I regret that I have but one life to give for my country."
    d. "America will be a kinder and gentler nation."
12. Some of the early writing still exists because:
   a. no one thought it important enough to steal.
   b. it was carved into soft clay.
   c. it was carved into stone.
   d. it was hidden in caves.

13. The Suez Canal connects the Red Sea with the:
   a. Atlantic Ocean.
   b. Indian Ocean.
   c. Mediterranean Sea.
   d. Panama Canal.

14. Most of the poor countries in the Middle East:
   a. have a long rainy season.
   b. are located on the Equator.
   c. have low oil production.
   d. have a problem with decreasing population.

15. A second problem in the Middle East is:
   a. unstable oil prices.
   b. conflict between countries.
   c. shortage of public housing.
   d. increasing death rates.

Fill in the blanks with the word or words that best complete each statement.

16. The second successful flight of a space shuttle since the Challenger disaster could mean more ____________ for Ohio.

17. Americans are producing twice as much ____________ as any other nation on earth.
18. For the first time in its history, Israel has let a __________________________________________________________________ from the Soviet Union land there.

19. A recent study says that __________________________________________________________________ may not be as bad for kids as people seem to think.

20. The number two toy this year is the ____________.

21. All of the countries of North Africa have a border on ____________________________________________.

22. A valuable resource found in North Africa is ____.

23. The deserts of Africa have little or no ________.

24. Rivers provide _________________ for irrigation.

25. November 22 was the 25th anniversary of the assassination of _____________________________.

26. Duke University is an example of a school which combines _________________ with high academic standards.
27. Judasim was the first religion to teach belief in __________ __________.

28. Most of the ships passing through the Suez Canal carry ____________.

29. One problem in North Africa and the Middle East is the unequal distribution of natural resources, like ________________.

30. There have been ___ Arab-Israeli wars since 1948.
APPENDIX G

ANSWER KEYS
1. Water is a valuable resource in the dry lands.

2. Zaire supplies most of the industrial diamonds used throughout the world.

3. Animal life is a resource of East and Equatorial Africa.

4. The animals of Africa are a great tourist attraction.

5. Mount Kilimanjaro and Mount Kenya are important mountains.

6. Cloves are an important spice from Tanzania.

7. Disease is a serious problem in East Africa. malaria; AIDS; sleeping sickness

8. The need for an education is another problem.

9. Waterfalls on the rivers are an important source of power.

10. The Colonial Period was the time during which African Kingdoms were taken over by Europeans.

11. The Colonial Period was painful because the African’s government and culture was taken away from them.

12. Exploitation happened when foreign companies took products from Africa at a large profit for themselves leaving little for the people of Africa.

13. Most East and Equatorial African countries were colonies of Europe until the 1960’s.
1. African Plateau
2. Nambib; Kalahari
3. High Veld
4. Great Plains
5. Orange; Limpopo; Zambezi
6. hydroelectric power
7. diamonds; gold
8. Dutch
9. Apartheid
10. Black Nationalism
11. protectorate
12. African kingdom
1. b
2. a
3. b
4. a
5. d
6. waterfall
7. south
8. water
9. island
10. southern
### Answer Key - 22

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<p>| 16. | jobs; employment |
| 17. | garbage; trash |
| 18. | hijacked plane; plane; airplane; Soviet jet; USSR plane |
| 19. | television; TV |
| 20. | Barbie doll; Barbie |
| 21. | water; ocean; sea; the Mediterranean |
| 22. | petroleum; oil |
| 23. | rain; rainfall |
| 24. | water; canals |
| 25. | John F. Kennedy; JFK; Kennedy |
| 26. | basketball; athletics; sports |
| 27. | one God (do not count God alone) |
| 28. | oil; petroleum |
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APPENDIX I

EXIT QUESTIONNAIRE FORM
EXIT QUESTIONNAIRE

Student __________________________ Date __________

For questions numbers 1, 2, and 3, please rank by writing a 1 by the type of notes you liked best, a 2 by the type of notes you liked next best, and a 3 by the way you liked least.

1. Which way of taking notes in social studies class did you like the best?
   ( ) Taking own notes
   ( ) Short-form guided notes
   ( ) Long-form guided notes

2. With which type of notes do you feel you learned more?
   ( ) Taking own notes
   ( ) Short-form guided notes
   ( ) Long-form guided notes

3. Which type of notes produced better quiz scores for you?
   ( ) Taking own notes
   ( ) Short-form guided notes
   ( ) Long-form guided notes

4. What did you like about taking short-form guided notes?

5. What did you not like about taking short-form guided notes?

6. What did you like about taking long-form guided notes?

7. What did you not like about taking long-form guided notes?

8. How could the guided notes be changed to help you learn more?
APPENDIX J

STUDENT EXIT QUESTIONNAIRE DATA
Student Exit Questionnaire Data

In answer to the question of which way of taking notes in social studies class did you like best:
   15 students liked the short-form best.
   1 student liked taking own notes best.
   No student liked the long-form best.

For the second best method of taking notes:
   13 students selected long-form.
   2 students selected short-form.
   1 student selected taking own notes.

For the method of notetaking least liked:
   14 students selected taking own notes.
   3 selected long-form as least liked.
   No student selected short-form as least liked.

In answer to the question of the type of notes that the student felt he or she learned more:
   12 felt they learned more with the short-form notes.
   2 felt they learned more with the long-form notes.
   2 felt they learned more with their own notes.

For the second best method of learning:
   12 selected long-form notes.
   3 selected short-form notes.
   1 selected own notes.

For the method that produced the least learning:
   13 selected own notes.
   2 selected long-form notes.
   1 selected short-form notes.

In answer to the question of which type of notes produced better quiz scores for you:
   15 selected short-form notes.
   1 selected taking own notes
   No student selected long-form notes.

The method of notes rated second best for quiz scores:
   15 selected long-form notes.
   1 selected short-form notes.
   No student selected own notes.

The least effective method of notetaking for learning:
   15 selected own notes as least effective.
   1 selected long-form notes as least effective.
   No student selected short-form notes as least effective.
When asked what they liked about the short-form notes:
13 said that they were easy, this included terms such as easy to follow, fast and easy, easy because you might miss something without them, and easy because you just had to fill in words.
2 said that they learned more.
1 said that you didn’t have to write as much.
1 said that he could study better from them.
1 said that he did not get lost with them.

In answer to what they did not like about the short-form notes:
8 students said that there was nothing that they did not like about the short-form notes.
1 student said they were boring.
1 student said that he got confused.
1 student said the answers were too long.
1 student said he did not like having to do them.
1 student said that you really had to listen.
1 student said that the answer key did not have all of the answers on the page. (I don’t know what that meant.)
2 students made no response.

In answer to what they liked about the long-form of guided notes:
9 students replied that they did not like the long-form.
1 student said it was sometimes easy to follow.
1 student liked the way you filled them in.
1 student said that they made you listen more.
1 student said that they were easier to study.
1 student said that you could use the overhead (to fill in answers that you missed when taking the notes.)
1 student said that you learned more than you needed.
1 student made no response.

When asked what they did not like about the long form:
4 students said that they took too long to write. This includes the response of the student who said, "When we are in a hurry, we have to take 5 minutes more than with the short form."
3 people said that it was hard to follow along and keep up with the long-form notes.
1 student said that they were too much to learn in the 3-minute study period.
1 student replied that there was nothing that he did not like about them.
2 students said that they were a lot of work and harder.
1 student called them "boring".
1 student said they were confusing.
1 student did not respond to the question.

When asked how the notes could be changed to help you learn more:
  1 student replied that the notes should all be the short-form.
  1 student said, "Don't have them."
  1 student said to leave less space for answers on the long-form. She felt that she needed to fill in all of the space.
  4 students did not comment.
  9 students indicated that they should not be changed with comments such as:
    I think they were great! There is nothing I would change. I learned a lot, thanks.
    I don't see how you could change them, they're wonderful!
    Don't change them.
    They were just great!
    They helped me learn more.
    Have guided notes all the time.
APPENDIX K

PROCEDURAL OBSERVATION FORM
**PROCEDURAL OBSERVATION FORM**  
**TEACHER CHECKLIST**

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- Discuss public posting chart
- Tell students to begin studying for quiz.
- Let students study 3 minutes.
- Have students put away notes.
- Give out quiz papers.
- Give students time to answer the questions on the quiz.
- Take up quiz papers.
- Discuss material from text using overhead projector and transparencies.
APPENDIX L

PROCEDURE FOR REVIEW OF NOTES
PROCEDURE FOR REVIEW OF NOTES

Time: 10-15 minutes

1. Students bring/get out notes--own notes, short-form guided notes, or long-form guided notes--from previous day's social studies class. (Seated at desks as small group)

2. Teacher
   a. reads printed part of first item on guided notes, or information from one student's written notes, and
   b. calls on one student to supply answer
   c. asks "What goes here?" (so to speak).

3. If student answers correctly, teacher praises then rewords same item/question for a group/choral response. 
   If student answers incorrectly, teacher calls on another student until a correct response is given. 
   If no one can supply the answer, teacher goes on to next item on guided or student's own written notes.

4. Same 2-trial procedure (Nos. 2 & 3 above) used for remaining items on guided or student produced notes (call on different students for individual responses).

5. Go through all items 2nd time with choral response.

6. Students turn over notes and teacher goes through all items, in random order, for choral response.
APPENDIX M

GUIDED NOTES PREPARATION FORM
## GUIDED NOTES PREPARATION TIME

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APPENDIX N

CHECKLIST FOR STUDENTS' NOTES
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