EFFECTS OF GUIDED NOTES STUDY CARDS
ON THE ACCURACY OF LECTURE NOTES AND NEXT-DAY QUIZ SCORES
OF STUDENTS IN A 7TH GRADE SOCIAL STUDIES CLASSROOM

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ABSTRACT

Students in middle and high school content area classrooms are required to read large amount of technical reading materials, listen to the teacher’s lecture, and participate in a class discussion. In addition, with an increasing attention given to the principle of Least Restrictive Environment (LRE), more students with special needs are now included in content area classrooms, although few individualized academic assistances are provided to accommodate those students’ difficulty.

Notetaking is one of the well-investigated strategies that can be used by students with and without disabilities without extensive assistance. Among the various notetaking strategies, guided notes have been proved to boost students’ quiz scores in many content areas, with various populations, and in various educational settings. Previous studies demonstrated that students with and without disabilities scored higher on recall-type quizzes when guided notes were paired with an in-class review session. However, few empirical attempts have been made to identify an effective review procedure.
The purpose of this study was to compare the effects of guided notes (GN) with post-lecture review and guided notes study cards (GNSC) with post-lecture review on the accuracy of lecture notes and on the next-day quiz scores of 7th grade students in an inclusive social studies classroom. Fifteen students with and without special needs served as the subjects for this study. The GN and the GNSC conditions were alternatively implemented. In the GN with review condition, students took notes using the GN and reviewed their notes independently for 5 minutes. In the GNSC with review condition, students recorded notes using differently-formatted guided notes. The GNSC were designed with study questions pre-printed on the back, so when cut out as study cards, they served as the review material. Social validity information was obtained from the students, the teacher, and two aides at the end of the study through interview. The results of this study suggest that the GNSC resulted in better quiz scores in eight of the fifteen students. Students recorded notes accurately in both conditions. Students generally preferred the GNSC as a review procedure. Suggestions for future research and practical implications are also discussed.
Dedicated to my family, my friends and colleagues in Japan
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CHAPTER 1

INTRODUCTION

Middle and high school content area instruction places several demands on students. For example, students experience an increasing amount of information covered in a class period, the introduction of more technical terms, and an extensive amount of reading. Due to these characteristics, lecture still plays a significant role in typical secondary level content area classrooms (Hamilton, Seibert, Gardner, & Talbert-Johnson, 2000; Kiewra & Frank, 1981; Lazarus, 1988; Sweeney, Ehrhardt, Gardner, Jones, Greenfield, & Fribley, 1999). At the same time, with more attention given to the principle of the least restrictive environment (LRE), increasing numbers of students with special needs are included in general education content area classrooms, where they are typically expected to manage large amounts of information, rapid paced instruction, and long and technical reading materials. Students with special needs who are included in the general education content area classrooms, along with some low-performing students, tend to experience difficulty
meeting the multiple expectations in a typical classroom context.

One strategy that has been shown to improve students' success with lecture content is notetaking. Students with special needs, however, still tend to lack prerequisite skills for effective notetaking, such as attending to the oral presentation of information, basic writing skills like spelling, punctuation or legible writing, or other skills such as error detection and organization skills (Boyle & Weishaar, 2001).

For those students, the guided notes strategy has been an effective accommodation, because guided notes allow students to actively participate in notetaking (Heward, 1994), follow the sequence of the lecture and discussion, and produce a useful summary of important information for future review (Lazarus, 1988; 1991).

Students' active participation, or level of active student responding (ASR), is a critical component of students' academic achievement. Heward (1994) suggested that ASR generates more learning, since the amount of achievement is positively correlated with the amount of time a student spend on the instruction materials. Although several studies have investigated guided notes with respect to increased ASR during the lecture (i.e., recording information during a lecture), there have been few attempts to increase students' active responding while they are reviewing their notes. Lazarus (1991, 1993) used guided notes and a 10-minute in-class review of
the notes in high or middle school content area classrooms, showing that their-class
review could further increase students’ quiz scores compared to the guided notes
without review. The review procedure used in these studies was silent, independent
review and there were no account as to what kind of observable responses students
made during the review. Reviewing or studying the notes often is an individual
process and does not involve observable responding even if students actually
engaged in review. For this reason, research is needed to develop strategies that
promote students’ active responding during lecture notes review.

1.1 Purpose of the Study

The purpose of this study was to evaluate the comparative effects of guided
notes (GN) with post-lecture review sessions and guided notes study cards (GNSC)
with post-lecture structured review sessions on the accuracy of lecture notes and on
next-day quiz performance of 7th grade students enrolled in a general education
social studies classroom.

1.2 Review of Relevant Literature

1.2.1 Notetaking and Students at Middle or Secondary Level

Lecture is the primary means of learning in secondary level classrooms
With increased specialty in the content areas, even middle school students,
regardless of their previous training or competency, are often expected to take
cOMPLETE and accurate notes while listening to a lecture or sometimes even reading
related chapters of textbooks (Huffman & Spires, 1994). Providing opportunities for
notetaking for middle school students is also a means of preparing them for
secondary and postsecondary education settings, where lecture is the predominant
method of instruction. Students’ notetaking proficiency can be one of the variables
that determine academic success (Carrier, 1983; Huffman & Spires, 1994; Kiewra,
1984). Therefore, notetaking during a lecture is a crucial skill for middle and high
school students.

1.2.2 Notetaking Functions

Notetaking is generally considered to have two functions that help students
to actively participate during class lectures; (1) a process function, which provides
all members of the class with numerous opportunities to respond as notetaking occur,
and (2) a product function, which yields a summary of the discussion for future
review (Boyle, 2001; Boyle & Weishaar, 2001; Fisher, & Harris, 1973; Einstein,

Several studies have shown that students who take notes during notes during
a lecture performed better on recall type tests (Fisher, & Harris, 1973) or recalled
more facts (Einstein et al. 1985). Other studies have shown that students who take
lecture notes and review these notes outperform those students who listen to the
lecture or who do not take notes, but review a complete set of teacher-provided notes
(Einstein, et al. 1985; Fisher, & Harris, 1973; Kiewra, 1985a; Kiewra & DuBois,

Kiewra (1985) found a correlation between completion and accuracy of
notetaking and students recall abilities regarding factual information. As completion
and accuracy increased so did students’ recall regarding factual information.

To summarize the discussion regarding the notetaking functions, Carrier
(1983) suggested the following three benefits of notetaking: (1) Students who take
notes during a lecture will learn more than those who simply listen, (2) In general,
students will learn more from a lecture if they both record and review their own
notes, (3) Review of notes will lead to improved performance.

Although notetaking during a lecture clearly has positive effects on students’
achievement, studies have also suggested that many students are poor note-takers
take effective notes can be attributed to the complex skill requirements of notetaking.
Notetaking involves abilities such as (a) identifying the major ideas and
relationships in a presentation, (b) decoding the intended meaning, and (c)
formulating and encoding the information in one’s own words (Simbo, 1988).
Moreover, students sometimes have to make fine discrimination of whether they should copy the information as presented, or paraphrase them in their own words. Barbetta and Skaruppa (1995) have also suggested that students’ inadequacies of notetaking may be related to the difficulties encountered when students are required to listen to a lecture and simultaneously take notes.

1.2.3 Active Student Response and Notetaking

Researches show that active student response (ASR) can increase academic achievement. An Active student response (ARS) is defined as an observable response made by the students to an instructional antecedent (Heward, 1994). In a lecture situation, for example, teacher’s statements such as “This is important,” or “You might want to make notes of this,” usually serve as effective cues (i.e., antecedents) for the students to start taking notes or looking at the teacher (i.e., observable responses).

The rationale behind ASR is that students’ academic achievement has a positive correlation with the time spent being in contact with curriculum materials (Rosenshine & Berliner, 1978). Students’ learning takes place within a context of the successive presentations of a three-term contingency between the learner and the teacher, which consist of (1) the teacher asks questions, give instructions, or present materials, upon which (2) the students make responses such as answering/writing
answers, reading words, or making comments, which lead to (3) teacher giving feedbacks in the form of praise statements, corrections, or asking further questions. This three-term contingency within the context of education is called the learning trial (Heward, 1994). Rosenshine and Berliner (1978) suggested that the more the teacher presented relevant learning trials, the greater the likelihood that the students learn content. Simply providing more time spent in academic instruction, however, does not necessarily guarantee improved performance among students, because increasing academic learning time does not always produce increase in students’ responding. For example, some students sit passively during instruction, and make few observable and content-related responses. Although some students learn the content by silently listening to the instruction, the only way to evaluate what each student has learned is to observe his or her performance of the skill being taught (Heward, 1994). Another related concept is opportunity to respond (OTR), which is a time-based measure of the interaction between teacher-formulated instructional antecedent stimuli and their success in establishing the academic responding desired or implied by the materials (Greenwood et al., 1984). Heward (1994) suggests that ASR provides a more precise measure and complete picture of students’ engagement during instruction than time-based measures such as time on-task and OTR for the following five reasons.
(1) ASR is a direct measure of the primary behavior of interest,

(2) ASR reveals not only how much instruction has been delivered in terms of learning trials, but also how much learning has taken place,

(3) The ASR data are reported as frequency count, which is sensitive to changes in the environment and is free from artificial ceilings as in percentage of observed intervals (Johnson & Pennypacker, 1980).

(4) ASR can be measured during instructional settings as varied as whole-class, small-group, peer tutoring, computer-assisted, or self-study; and across all curriculum contexts.

(5) ASR is a simple measure that practicing teachers can use to directly assess how much active instruction their students are receiving.

Heward (1994) further proposes three benefits of increasing ASR during instruction. First, a large body of literature supports that ASR generates more learning. Second, ASR provides important feedback to the teacher as to whether the students are learning or not, based on which the teacher can modify or change the way she is presenting instruction. Third, more ASR correlates with increased on-task behavior.

Based on this discussion, it is crucial in terms academic achievement that the students are provided with maximum opportunities to actively respond when
instruction is taking place. Even during a lecture when students are exposed to the learning materials, taking lecture notes is one way to actively contact relevant instructional materials. As Carrier (1983) pointed out, students’ notes are an indication that students are actively engaging in learning from the lecture (Carrier, 1983).

1.2.4 Notetaking and Students with Disabilities

Many students with disabilities are now included in regular classrooms which employ a lecture/discussion format to convey important information (Lazarus, 1991, 1993, 1996; Saksi, Swicegood, & Carter, 1983), and those students with disabilities often lack prerequisite skills for effective notetaking, such as attending to the oral presentation of information, simple writing skills like spelling, punctuation or legible writing, or other skills such as error detection and organization skills (Boyle & Weishaar, 2001).

Hughes and Suritsky (1994) have shown that college students with learning disabilities are poor note-takers compared to non-disabled students. Given the strong association between effective notetaking and successful academic performance, deficits in these skills can impede students’ academic performance.
Einstein et al. (1985) have demonstrated that less successful college students, compared to successful students, benefited more from studying their recorded notes (Einstein et al. 1985).

1.2.5 Rationale for Using Guided Notes

Taken as a whole, the two basic functions of notetaking and the positive effects of notetaking for students with learning problems, research has supported several notetaking strategies, such as guided notes and graphic organizers (Katayama & Robinson, 2000; Sasaki, Swickegood & Carter, 1983). Sasaki et al. (1983) also identified five components that should be considered when designing/implementing notetaking formats for adolescents. These five components included space, subordination, division, questions, and connections. Implementing those procedures and instructing students to utilize these components are, however, usually cumbersome and difficult for adolescents with learning disabilities. A specific format for organizing complex academic material would greatly benefit students with special learning needs (Sasaki et al., 1983). In addition, Carrier (1983) suggested that although lecturers could facilitate students’ notetaking by highlighting important information and providing a clear organizational framework, students with different abilities and levels of prior knowledge may require different notetaking strategies.
1.2.6 Guided Notes Research

Guided notes can be an effective curriculum enhancement for students with and without disabilities. Guided notes are instructor-prepared handouts given to students to present skeleton outlines that contain the main ideas and related concepts of a lecture and designated spaces for students to write key points as the lecture occurs (Austin, Lee, Thibeault, Carr & Bailey, 2002; Lazarus, 1988). A lecture with guided notes is often accompanied with an overhead presentation of complete set of notes that would provide students with prompts to write the notes and with ongoing feedbacks on what they are recording. With those accommodations, guided notes allow students to frequently record facts and concepts during a lecture while a completed outline is projected on a screen. The use of guided notes helps students to actively participate in notetaking (Heward, 1994), follow the sequence of the lecture and discussion, and to produce a useful summary of important information for future review (Lazarus, 1988; Lazarus, 1991).

Barbetta and Skaruppa (1995) proposed that using guided notes in university classes could eliminate the difficulties of students having to engage in duel tasks of listening and writing during a lecture. Guided notes reduce ambiguity in notetaking because they provide specific antecedents that indicate where and what to write.
Austin et al. (2002) suggested that improvements in the accuracy and organization of students’ notes accomplished by the use of guided notes could potentially enhance the quality of class discussions, due to students’ increased confidence in the accuracy of their notes as a basis for asking questions, as well as reduction of time spent in writing notes.

Several other studies have demonstrated positive effects of guided notes on students’ academic achievement. For example, Yang (1988) examined the effect of personal notetaking, guided notes only, and guided notes with review on the next-day quiz scores of five students with learning disabilities included in a regular education middle-school science classroom. The review used in this study was for the students with learning disability, and took place in the resource room with the resource room teacher. The results demonstrated effectiveness of guided notes for improving the participants’ academic achievement. All 5 students with learning disabilities improved their daily quiz performances. Twenty two of the 23 students in the class improved their quiz scores.

Pados (1989) reported that the use of guided notes resulted in improved quiz scores for a wide range of students including typically developing students, gifted students, and students with learning disabilities.
Sweeney, Ehrhardt, Gardner, Greenfield, and Fribley (1999) used guided notes during a remedial summer school American history class. The participants were academically at-risk high school students, one of whom had been identified as developmentally handicapped while two had limited English proficiency. Two types of guided notes; short and long forms, were compared with regard to accuracy of students’ notes, scores of daily quiz, and students’ preferences. The results showed both types of guided notes were similarly effective in improving accuracy of students’ notes and daily quiz scores.

A study conducted on seven incarcerated adolescents with learning and behavioral problems enrolled in a social studies classroom also reported positive effects of guided notes on note accuracy and next-day quiz scores (Hamilton et al., 2000). In addition to the improved academic performances, 86% of the participants (six of the seven students) preferred using guided notes over their own notes.

White (1991) further extended the research to demonstrate that eight high school students with learning disabilities improved the accuracy of notetaking by using guided notes, and the improvements were then generalized to students’ own notetaking. Following the guided notes phases, the participants’ own lecture notes contained 67% more accurate information compared to their notes during the baseline condition.
Two studies by Lazarus (1991, 1993) explicitly addressed the product function of notetaking by designing a review session. Both studies demonstrated that 10 minute review of recorded guided notes following a lecture resulted in increased in quiz performance for middle- and high school students with learning or behavioral problems included in general content area classrooms.

In one study (Lazarus, 1991), six high school students (five males, one female) with learning disabilities (LD) included in a regular science classroom served as primary participants, while 13 students without disabilities were also included in the study. Lazarus used an ABAC design to examine the effects of guided notes and guided notes with in-class review on the students’ chapter test scores. In the baseline conditions, students recorded notes in their usual way, and were prompted to review their notes the day before the chapter tests. In the guided notes condition, all students including students without learning disabilities were given teacher-prepared guided notes and instructed to use them during the lecture. A day before the chapter tests, the teacher again reminded students to review their notes, but did not provide any in-class study time. In the guided notes and review condition, in addition to the guided notes, students were given 10 minutes at the end of each class period to independently review their notes. The teacher-prepared chapter tests contained 20 items, and occurred every 5 to 7 days.
The results of this study supported the effectiveness of guided notes over students’ own notes, and suggested that in-class review sessions further boosted the quiz scores. Students without learning disabilities slightly improved their chapter tests scores from the mean of approximately 78% during the baseline to 85% during the guided notes condition. Further improvements were observed when the in-class review was introduced (mean over 92%). Percentage of correct responses for the six students with learning disabilities averaged 14 to 33% during the first baseline, 57 to 66% during the guided notes condition, 15 to 38.25% for the second baseline, and 82.50 to 90% when the review time was introduced. Moreover, the percentages of correct responses for all students with LD paralleled or surpassed non-disabled peers’ scores in the guided notes plus review condition.

The findings of this study have important practical implications. First, the participants were able to maintain learned content for several days. Second, the review period suggested a better use of an effective learning strategy like guided notes.

The review procedure used in both studies required the students to silently read through the notes as many times as possible during the 10 minutes. No instruction was given regarding how to review the notes, although six boxes for
“review tally” were pre-printed on the notes. Also, no behavioral data were collected during the review sessions, making it difficult to determine how students used the space for review tally.

1.2.7 Teaching Learning Strategies

Guided notes studies have provided a useful and reliable body of data to suggest that this strategy could become a useful accommodation with students who experience difficulty in typical classrooms. Little has been said, however, about how students should revise and review their notes (Kiewra, 1985b). In other words, even with promising data for the product function of the guided notes, those findings have not been integrated as a functional study skill. Furthermore, there is lack of research to suggest how students should study their notes to prepare for quizzes and tests (Kiewra, 2002).

Kiewra (2002) states that students can learn how to learn when taught appropriate strategies, and that teachers can teach students how to learn. He points out two things that “good strategy instructors must know” (p.1): (a) which strategies are effective, and (b) how to teach them by embedding strategy instruction into content teaching. The latter, how to teach effective strategies – is done by following these four steps (Kiewra, 2002):

(1) introduce the strategy by modeling it and describing it,
(2) sell the strategy by telling why it works,

(3) generalize the strategy by telling where else it is useful, and

(4) perfect the strategy by providing practice opportunities.

Huffman and Spires (1994) used explicit instruction to teach 88 sixth grade students notetaking skills. Forty one students were enrolled in an academically gifted program, and 47 students were enrolled in average classrooms. Half of these students served as the control group, and the rest of the students received explicit instruction of notetaking as treatment group. The explicit instruction involved the following five stages: 1) providing rationale and explanation of the strategy; 2) verbal modeling and demonstration of the strategy by the teacher; 3) teacher and student working collaboratively to use the strategy; 4) teacher and peer feedback on use of the strategy; 5) independent student use of the strategy. Statistical analysis of the results showed that students in the treatment group recorded more notes, scored higher on the test, and showed more positive attitude toward notetaking.

Kiewra (2002) suggests some of the effective strategies in order to meet the former requirement: knowing effective strategies. One of the strategies suggested is self-testing. He argues that “many students do not know that they don’t know the material until they are tested.” In order to maximize the effectiveness of the guided notes strategy, researchers should attempt to address this point by identifying a
strategy that will integrate Kiewra’s suggestions, and by empirically comparing the effects of one or more different review procedures. Guide notes study cards have the potential for efficient and effective review of lecture notes.

1.3 Research Questions

This study was designed and conducted to produce empirical data related to each of the following research questions.

1. What are the comparative effects of guided notes (GN) and guided notes study cards (GNSC) on the accuracy of the lecture notes taken by 7th grade students in a social studies classroom?

2. What are the comparative effects of guided notes (GN) and guided notes study cards (GNSC) on the next-day quiz scores of 7th grade students in a social studies classroom?

3. What are the students’ opinions about two procedures (GN and GNSC)?

4. What are the teachers’ opinions about two procedures (GN and GNSC)?
CHAPTER 2

METHOD

This chapter describes the methods and data collection procedures needed to conduct the study. The detailed descriptions cover the participants, setting, procedures, measurement, experimental design, dependent variables, and social validity assessments.

2.1 Participants

2.1.1 Target Students

Fifteen students in a 7th grade inclusive social studies classroom in a suburban middle school served as subjects for this study. A letter that explained the rationale and procedures of the study and asked for consent for participation (Appendix A) was sent to the parents or legal guardians of all 23 students in the class. Data were collected and reported here only for those students whose parents or guardian had provided signed consent. All of the 15 participants (7 boys, and 8 girls) were Caucasians. Three students with special educational needs participated in the study. Those students were two
students who had developmental disabilities and a student with hearing impairment who were included in the class.

Student 1 was a 14 year-old male with attention deficit/hyperactivity disorders (ADHD) and developmental disabilities. His performance on the Wechsler Intelligence Scale for Children-Third Edition (WISC-III) administered by the school during the study suggested a full-scale IQ of 60. He attended a special education resource room 1 hour each school day for individualized instruction in reading, language arts and math, and he received speech therapy 40 minutes a week. Student 2 was 13 years and 8 months old at the end of the study. He had been diagnosed with ADHD and Tourette’s syndrome and received resource room instruction for math and language arts 1 hour each school day, as well as one to one assistance from an aide in general education classrooms. Student 3, a 14 years and 2 months old girl, had a hearing impairment and used a sign language interpreter for all classes she attended. With the sign language interpreter, she was able to attend all the classes, and to independently record lecture notes without assistance.

Other 12 students did not have documented special needs, and received regular education instruction for the whole day at school, except for Students 6 and 10, who were enrolled in supplemental math classroom for slow learners. Table 1 shows demographic information of all 15 participants.
<table>
<thead>
<tr>
<th>Student</th>
<th>Age</th>
<th>Gender</th>
<th>Grade</th>
<th>Special Educational/ Remedial Services</th>
<th>IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>14-1</td>
<td>M</td>
<td>B</td>
<td>ADHD/ Dev. Disabl.</td>
<td>60^b</td>
</tr>
<tr>
<td>2</td>
<td>13-8</td>
<td>M</td>
<td>B+</td>
<td>ADHD, Tourette’s Syndrome</td>
<td>Low Average^c</td>
</tr>
<tr>
<td>3</td>
<td>14-2</td>
<td>F</td>
<td>A</td>
<td>Deaf</td>
<td>N/A</td>
</tr>
<tr>
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<td>13-4</td>
<td>F</td>
<td>A-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>13-11</td>
<td>M</td>
<td>A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>6</td>
<td>13-10</td>
<td>M</td>
<td>B</td>
<td>Remedial Math</td>
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</tr>
<tr>
<td>7</td>
<td>13-6</td>
<td>M</td>
<td>A-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>8</td>
<td>13-6</td>
<td>M</td>
<td>B</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>9</td>
<td>13-8</td>
<td>F</td>
<td>B+</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>12-11</td>
<td>F</td>
<td>B</td>
<td>Remedial Math</td>
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</tr>
<tr>
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<td>F</td>
<td>A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
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<td>F</td>
<td>A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
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<td>F</td>
<td>A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
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<td>M</td>
<td>A-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>15</td>
<td>13-6</td>
<td>F</td>
<td>A-</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 2.1: Demographic data for each participant

Notes:

- ^a Students ages at the end of the study.
- ^b = Full Scale IQ on WISC-III as of May 12, 2004
- ^c = from MFE evaluation as of January 29, 2004

N/A = Not Applicable
2.1.2 Classroom Teacher

The classroom teacher had taught seventh grade social studies in the same school for 2 years at the beginning of the study. He is a graduate of Ohio Dominican University and holds a B.A. in secondary education. He presented the lectures throughout the study, and his role during the study involved determining the content of the lectures, preparing lecture outlines, giving the lectures, and administering the quizzes.

2.2 Experimenters

The experimenter was a full-time M.A. student in the special education and in Applied Behavior Analysis at The Ohio State University. She received B. A. in 2002 with education and Teaching English as a Second Language (TEASL) from the International Christian University, Tokyo, Japan. She prepared the lecture notes (guided notes), and next-day quizzes and served as primary data collector for the study.

Two doctoral students in the Special Education Program at The Ohio State University served as assistant experimenters for the study. They served as secondary data collectors, and assisted implementation of the instructions for review procedures under the supervision of the primary experimenter.
2.3 Setting

The 7th grade social studies classroom in which the study was conducted was located in a middle school in a large, suburban school district. The school served students in 7th and 8th grades. The class period was in 9th period and lasted for 43 minutes from 2:35 PM to 3:18 PM on Mondays, Tuesdays, Thursdays, and Fridays and from 2:39 to 3:19 on Wednesdays. The students sat in a group of three of four during the class period, and two student aides sat next to each of the student with ADHD. Two sign language interpreters took turns to interpret the lecture. They stood facing the student, in front of the large white board that was located in front of the classroom. The teacher stood next to a LCD projector and a lap-top computer located at the back of the classroom while he gave lectures, so that he could operate the machines to project lecture slides in the Microsoft Power Point ® on the white board. Figure 2.1 shows the setup of the classroom during the study.
Figure 2.1. Classroom setup for the seventh grade social studies classroom
2.4 Definition and Measurement of Dependent Variables

2.4.1 Accuracy of Students’ Lecture Notes

The number of accurately recorded key words on students’ guided notes was recorded throughout the study. The experimenter used a checklist (Appendix B) that contained all targeted words from the day’s guided notes to compare students’ notes on an item-by-item basis. Guided notes contained 15 blanks (10 blanks during the sessions 1 through 3) in which students filled in the fact or concept that matched the teacher’s lecture presentation. An item (word) was considered accurately recorded if the student had a correct written response in a blank space provided in the guided notes. Items that matched or that conveyed the same meaning as the answers on the checklist (Appendix B) were scored as correct (e.g., 9 for nine, drop for decline). Spelling errors were not counted as incorrect as long as the written answer was phonetically similar to the targeted word. An item was scored as incorrect if the written answer did not match the answers on the checklist, or if it had more than half of the targeted word omitted, or if it was unintelligible. No response was scored if the blank on the guided notes did not have a written response. Number of each student’s accurate and incorrect responses, and no responses was recorded each day.
2.4.2 Next-Day Quiz Scores

Next-day quizzes (Appendix C) consisted of 10 fill-in-the-blank recall questions. Quiz items were scored as correct if they match the items on a quiz scoring sheet (Appendix D) prepared by the experimenter. Student responses that contained spelling errors such as omissions, transpositions, or added letters were also scored as correct if they can be phonetically identified as the word given in the answer key. One point was given for each correctly answered recall item.

2.5 Procedures to Enhance the Believability of Data

2.5.1 Interobserver Agreement (IOA)

Two doctoral students in special education at The Ohio State University served as secondary data collectors to obtain interobserver agreement (IOA) on the scoring of the next-day quizzes and on accuracy of students' notes. One of the secondary data collectors scored photocopies of the students' next-day quizzes and notes for 42.9% (three out of seven) of the sessions of each guided notes condition. These scores for the students' target behaviors were compared to the scores of the experimenter. Agreement was calculated by dividing the number of agreements by the number of disagreements and multiplying by 100%.
2.5.2 Social Validity

Students, the social studies teacher, Students 1 and 2's aides, the sign language interpreter were asked to participate in an interview session after the termination of the study. The interview purported to obtain their reactions towards two types of guided notes used in the study. Nine, twelve, and eight questions were asked to the students, the teacher, and the aides, respectively. Their answers were tape recorded upon obtaining the interviewee's verbal consent for doing so.

2.6 Independent Variables

The independent variables in this study were notetaking strategies called guided notes (GN) with a post-lecture review session and guided notes study cards (GNSC) with a post-lecture review session.

2.6.1 Guided notes (GN)

Guided notes (GN) were developed from the lecture outlines (Appendix E) prepared by the social studies teacher. The lecture outline included the main points, key terms and their definitions, and main ideas, formatted in a topical outline on letter-sized sheets of white copy paper. Typically, the lecture outline was directly transformed to the GN with 10 to 15 subheadings, so that the GN would keep the same topical outline format (Appendix F). A total of 15 words in the guided notes (10 during the sessions 1 through 3 in the first GN condition) were left blank with underlines to provide visual
cues for the students to record an appropriate word that would fit into the blank. The experimenter chose the words to be left blank. The total number of words on a set of GN varied approximately from 2200 to 4000 words, and the total number of pages ranged from 3 to 6 pages, depending on the amount of information covered in a lecture. For an example of GN, see Appendix F.

During the guided notes (GN) review sessions, the students were given opportunities to independently and silently study their notes for five minutes in their seat. The review procedures will be discussed later in the Procedures section.

2.6.2 Guided Notes Study Cards (GNSC)

Guided notes study cards (GNSC) were printed on letter-sized cover papers. The front side of GNSC served as the guided notes, with a lecture outline and 15 blanks to record information. The back side of GNSC provided students with study materials for the review. Appendix G shows examples of GNSC used in the study. A single 8.5” by 11” cover sheet paper was formatted into six boxes (approximately 5” by 4”) or eight boxes (approximately 3” by 4”) with a line separating each box. Five different colors (green, blue, canary, ivory, and gray) were rotated so that the students could discriminate a day’s notes from the previous day’s notes. The content of each lecture was always assigned to 15 cards, so when a sheet contained 6 boxes, the total number of sheets was three, whereas total of two sheets was used when 8 boxes were assigned to a sheet. The
first “box” functioned as the “cover card”; it contained the title of the lecture, date the lecture was given, and the student’s name. The remaining “boxes” were numbered from 1 to 15 to show the sequence of the presentation. Each box contained one or more lecture facts or concepts, and a blank to cue students to record information (e.g., “Nile is the longest river in Africa.”). The number of facts/concepts in a box ranged from one fact to three or four facts per a “box”. With the 15 cards assigned for a lesson, the total number of words on a lecture notes ranged approximately from 2000 to 4100 words, depending on the length of each lecture. On the back of each card was a question about the word left in the blank (e.g., “What is the longest river in Africa?”), which served as study material during the review time following the day’s lecture.

The GNSC for the lecture were prepared by the experimenter based on the lecture slides, which had already been developed by the classroom teacher (Appendix H). Information on a power point® slide was directly transferred to one “box” on the study cards, and a critical word was left blank with an underline so that the student could record the word during the lecture. The experimenter selected which word would be left blank.

Following the lecture, the teacher directed the students to cut out their “boxes” from their guided notes, which served as study cards. Then the teacher assigned 5
minutes to study the cards. Students were asked to study their cards individually and quietly. The detailed review procedures will be presented in the procedure section.

2.7 Experimental Design

This study used an ABAB reversal design to analyze the effects of the guided notes study cards procedure on students’ note completion, accuracy, and next-day quiz scores. The baseline condition consisted of lectures in which students used GN and post-lecture GN review sessions. When baseline data became stable, the experimenter implemented the GNSC and post-lecture GNSC review sessions. The experimenter returned to the baseline condition followed by a re-introduction of the GNSC procedure.

2.8 General Procedure

The teacher prepared the lecture outlines (Appendix E) or the Power Point® slides (Appendix H) for the lecture at least 1 day before the lecture, from which the experimenter developed blank sets of either GN (Appendix F) or the GNSC (Appendix G), a next-day quiz (Appendix C), a checklist for the note accuracy (Appendix B), and a quiz scoring sheet (Appendix D).

2.8.1 Next-Day Quiz

A class session began with administration of a 5-minute “next-day quiz” which contained 10 recall and fill-in-the-blank type of questions based on the lecture facts from the previous day’s lecture. Ten of the fifteen key words that were left blank in the
previous day's guided notes were on a quiz. Therefore, the answers for a quiz were always any given 10 of the 15 words that were left blank in the lecture notes. Quiz questions were worded differently from the lecture notes to control for the potential confound of the students responding to certain word orders (e.g., "Incas used ___llamas___ for transportation." in the lecture notes, and "___Llamas___ was a means of transportation for the Incas" in the quiz.) For sessions 1 through 3, all ten items were directly converted to the quiz questions. In order to control for the potential confounds of the sequence of presentation in the guided notes, the questions were randomly ordered. This was accomplished through the following steps. First, the experimenter consecutively numbered the lecture facts in the guided notes from 1 to 15. Second, the experimenter prepared fifteen 2" x 2" cards and numbered the cards 1 through 15. The numbers on the cards indicated the lecture fact 1 to 15. Third, the experimenter drew 10 out of these 15 cards. Finally, the experimenter shuffled the 10 selected cards and raid them on the desk, and the quiz questions were prepared from the 10 lecture facts whose numbers were drawn, in the order of the cards on the desk.

For the last four sessions (sessions 14 to 17), the quiz was administered for 2 minutes, since the class period was shortened due to a school event. Students who were absent from the previous day's lecture were not required to take the next-day quiz.
When all students arrived in the classroom, the social studies teacher told the class to clear the desks except for the notes from yesterday, and to place the yesterday’s notes at the center of the desk with front page facing down. Next, he distributed single-page quizzes to each group of students, set the timer for 5 minutes, reminded the students to write their names in a blank provided at the top of the sheet, and said, “Pencils ready, flip the paper, and begin.” Students used pencils to write their answers. Students raised their hands when needed assistance, and the teacher went to his or her seat to give the needed assistance. The teacher also collected students’ notes from the previous day and handed them to the experimenter. Once the timer rang, the students were told to stop writing and put their pencils down. The teacher and the experimenter collected the quizzes. Once students’ quizzes were collected, the experimenter photocopied all quiz sheets for the data collection purpose before scoring the quizzes using an answer checklist. Students who scored 10 out of 10 problems were given an extra point that was added to their grade. Students’ grade based on a point system to which students’ entire course work was converted at the end of school year. Each student had a total of 600 possible points if he/she did not miss any. Extra points allowed the students to compensate for any point losses he/she had made, and there were total of 50 opportunities for the students to earn extra points. The quizzes composed of 17 of these opportunities. The teacher used those extra points to determine each student’s grade at
the end of the term. Depending on the schedule of the class or other school events, there were days in which no lecture was administered, and there was no next-day quiz after these occasions.

2.8.2 Lecture

A 5-minute quiz was followed by a 10-to-20-minute-lecture, in which the teacher presented 10 to 30 slides related to the day’s topic. No lecture was given on Fridays after the quiz, and the class period was devoted to other social studies activities.

Before each lecture the teacher told students to record lecture information on the guided notes, and provided rationale and consequence for taking notes. For example, a typical statement was, “Don’t forget to take notes because the points from the lecture will be in tomorrow’s quiz.” Next, the students received guided notes for the day’s lecture, and the teacher presented the lecture in a darkened room so the students could easily see the slides projected on the white board. A sample set of lecture slides is shown in Appendix H. For the deaf student included in the classroom, an interpreter stood next to the white board to sign the teacher’s verbal presentation, and the Power Point® slides projected on the white board provided visual cues for her to record the words in the blanks on the guided notes. The teacher supplemented his presentation by using
additional photographs, maps, and by conducting in-class-discussion throughout the conditions. Students asked questions or answered to the teacher presented in-class discussion questions by raising their hands.

2.8.3 Review

After the lecture, the teacher administered a 5-minute review, in which students independently and silently reviewed the guided notes they had recorded during the lecture on guided notes or guided note study cards. Different review procedures were used in each condition, and these procedures will be explained later. After the 5-minute review, the teacher encouraged the students to take the notes home and study them. For example, the teacher would say, “You should study your notes at home tonight, because there will be a quiz over today’s lecture.” Students were allowed to take their notes home, and were required to hand them in the following day for the purpose of completion and accuracy data collection.

2.8.4 Guided Notes Instruction

Because the students had already used guided notes in the classroom, no particular training was required. During GN condition, the teacher distributed the guided notes, told the students to record the words that would fit in the blanks on the notes, and started his lecture. In the first session, the teacher stopped the lecture when he came to
the first blank on the notes, and identified the word students were required to write in the first blank. The experimenter circulated the room and checked whether students had actually recorded the correct words.

2.8.5 Guided Notes Study Cards Instruction

A doctoral student and the experimenter served as trainers to provide a two-part-training on how to use of the GNSC for the whole class for three consecutive sessions. The training, which lasted for 20 minutes, took place in the social studies classroom using the actual lecture materials. Before the class period began, the trainers set up the 6 tables so each group had 4 pairs of scissors, 4 sets of the GNSC, rubber bands and 4 envelopes placed in a wire basket, and four “placemats (Appendix I)” laid under the wire basket. A “placemat” is a letter-sized cover sheet paper formatted with two boxes titled “Correct” and “Incorrect.” The review procedures were written at the top of the sheet. The right hand side of the bottom half of the sheet was “Incorrect” written on a red background, and the left hand side was titled “correct” on a green background.

On the first day of the introduction of the GNSC, the first part of training was conducted. The assistant experimenter stood before the class and briefly introduced the GNSC to the students (e.g., “You are going to use a new type of guided notes called guided notes study cards. This new type of guided notes will help you learn much better,
and I will tell you how it works later after the lecture”). Next, he explained how to record information on the guided notes for 5 minutes (e.g., “You need to fill a correct word in the blank like you usually do with guided notes. Look at the lecture notes in front of you. On the first box, you write your name. This first box will be the cover card when you cut it out later, so always place it on the top of the other cards. Now look at the other boxes. They are numbered from 1 to 15. The first slide will be the same as the box with the number 1 at the top.”).

Following the doctoral student’s presentation, the teacher began the day’s lecture. When his presentation came to the first blank on the notes, trainers (i.e., primary and the assistant experimenters) stopped the teacher for a while and told the students what word they needed to have copied before the teacher resumed his lecture. Trainers also went around the room to make sure all students recorded the appropriate word. Trainers continued monitoring whether the students recorded the correct word, provided verbal praises and/or feedback by circulating the room for the duration of the lecture.

The second part of training was conducted for three consecutive sessions. After the lecture, trainers provided modeling and guided practice, and independent practice of how to review the study cards. First, trainers stood in front of the class and instructed the students to cut out the cards in 2 minutes. Each student took a pair of round-tipped scissors and cut out study cards while the trainers timed them. The students were
instructed first to cut two sheets together vertically in the middle on the line, then cut horizontally three times on the lines which separated each card. Trainers praised students for cutting out the cards fast enough. Second, trainers explained and modeled how to review the cards. The doctoral student said, “This is how you should be studying these cards. This is how your teacher studied at college, this is how university students study, and you are starting it now. The doctoral student placed a “placemat” (Appendix I) in front of him, separated the “cover card” from other 15 cards, and act out the following study procedure while saying out loud each of the steps. The study procedure involved the following steps:

(1) Shuffle the cards,

(2) Turn the cards so the back side (i.e., the question) would face the learner (in this case, the doctoral student),

(3) Take out one of the cards and read the question to himself,

(4) Say the answer to himself,

(5) Flip the card to check the answer,

(6) Place the card on the “correct” side of the “placemat” if the answer was correct and on “incorrect” if incorrect,

(7) If incorrect, flip the card back and check the question and answer again before placing it on the “incorrect” side of the placemat,
(8) Repeat this until going over all 15 cards,

(9) Take the cards on “incorrect” side and start reviewing until all cards were moved to the “correct” side, and

(10) Go back to step one and keep reviewing until the 5 minutes ended.

Third, trainers had the students say the steps. Fourth, students were given 5 minutes to independently practice reviewing the cards. During the independent practice, trainers circulated the room to check whether the students were correctly sorting the cards on the “placemat”. This was done by randomly stopping at one of the students, picking up a card from the correct pile and asking the question written on the card to the student. If he/she answered correctly, the card was returned to the “correct” pile. When he/she did not answer correctly, the card was placed on the “incorrect” pile. Fifth, trainers called on one student who showed competence in the study procedure and had him model the whole procedure in front of the class. The five components of the second part of training took about 15 minutes.

2.8.6 Procedure to Obtain Consumer Opinions

Students, student aides, and the social studies teacher were directly interviewed after the termination of the study to obtain their opinions about two types of guided notes. The responses of the participants were tape recorded after getting the interviewee’s verbal consent for doing so. Students were asked 9 questions about their feelings or
reactions for the two guided notes procedures. Teacher interview had 12 questions. Two student aides of the two students with ADHD were asked 8 questions. The interview questions are shown in Appendix J. Interviews for the students were conducted by the primary experimenter in hallways outside the social studies classroom, and the teacher and the aides were interviewed in the classroom after school. In all interviews, the interviewer (primary experimenter) and the interviewee sat facing each other with a desk between their chairs. The distance between two persons was about 1m. At the start of the interview the experimenter asked if the interviewee would mind being tape-recorded the interview. After receiving consent for recording, the experimenter started the recorder and asked the interviewee to state his or her name. This process was taken in order to make sure that his or her voice was sufficiently loud enough to be heard when recorded, and to identify the interviewee. Next, the experimenter placed two forms of guided notes on the desk to show to the interviewee, and named each one of them. Guided notes (GN) were referred to as the guided notes, and the guided note study cards were referred to as the guided note study cards (GNSC). During the interview, the experimenter referred to each form of guided notes as needed by pointing at the one which was being discussed. The interviewee was also allowed to refer to either type of guided notes when he or she needed to. After showing and identifying two types of guided notes, the experimenter started asking questions from question 1, occasionally referring to the questionnaire.
sheets (Appendix J). The interviewees did not have access to the questionnaire sheets.

During the interviews with the students, there was a letter-sized sheet of paper on the
desk, which contained five sentences typed in font 36: A. I really liked it, B. I liked it, C.
I don’t care one way or the other, D. I didn’t like it, and E. I really didn’t like it
(Appendix K). This sheet of paper was used for items 8 and 9 of the interview, when the
student was asked to identify his or her feelings about using and reviewing the GN or the
GNSC. When all questions were asked, the experimenter thanked the interviewee and
stopped the recorder, and the interviewee was allowed to leave.

2.9 Procedures for Each Condition

2.9.1 Guided Notes (GN) Condition

2.9.1.1 Next-Day Quiz. On the days following a previous day’s lecture, the 43
minute class began with a quiz which contained 10 recall-type questions randomly
selected from the previous day’s lecture facts. The quiz procedure was identical to the
one explained in the general procedure section.

2.9.1.2 Lecture. The 5-minute-quiz was followed by a lecture. GN was given to
each student during this condition. The length of the lecture varied depending on the
content of the day’s lecture, but lasted approximately 10 to 20 minutes.

2.9.1.3 Review. A 5-minute review was administered following the lecture in
which the students independently and silently looked over the GN which they had
recorded during the lecture. At the beginning of the review, the teacher told the students to (1) silently and independently read the GN from the beginning to the end, (2) try to ask questions to themselves without saying them out loud, and (3) when they get to the end of the notes, go back to the beginning and continue looking at the notes and asking questions until the timer beeped. After giving the verbal instruction, the teacher set a timer for 5 minutes and said, “Start reviewing.” The teacher circulated around the room during review time to monitor task persistence. The experimenter circulated the room to provide praise and corrections as needed. The students were allowed to take their GN home to study, and the teacher encouraged studying the notes at home by saying that studying the notes at home would help them learn the content.

2.9.2 Guided Note Study Cards (GNSC) Condition

2.9.2.1 Next-Day Quiz. The 43 minutes class began with the 5-minute quiz. The quiz procedure was identical to the one used in the GN condition.

2.9.2.2 Lecture. Lectures during this condition followed the same procedures as the GN condition except for the use of GNSC instead of GN.

2.9.2.3 Review. Following the lecture, the teacher instructed the students to cut out the study cards from the guided notes in 1 minute. Unlike during the review training, 1 minute was considered to be sufficient because the students began to spend less time cutting the study cards. When students were done, they were instructed to put the
scissors back to the basket, and told to study the cards following the ten steps introduced in the training. The teacher set a timer for 5 minutes and signaled the beginning of review time by saying, “Start reviewing.” The teacher and the experimenter circulated the room to check students’ understanding by randomly stopping at a student, picking up one of the cards on the correct pile, and asking the question written on the card to the student. As the 5 minutes elapsed, the social studies teacher instructed that the student take a rubber band from the wire basket placed at the center of the table, and tie the cards with the rubber band. Then he instructed the student to take a manila envelop with each student’s name and “Yesterday’s notes” written on it, and to put the deck of cards in the envelop.

The students were allowed and encouraged to take the cards home and study them, and the teacher told the class that studying the notes at home would help them learn the content.
CHAPTER 3

RESULTS

This chapter reports the results of the study. First, interobserver agreement results are presented with regard to percent correct of the accuracy of students’ notes and frequency count for the next-day quiz scores. Next, data for each student’s note accuracy and next-day quiz scores in each condition are presented. Finally, the results of the social validity questionnaire are presented.

3.1 Interobserver Agreement

Each student’s ranges and means of IOA on the accuracy of lecture notes across conditions are presented in table 3.1. Table 3.2 provides individual student’s ranges and means of IOA on next-day quiz accuracy across conditions. Because student 10 was absent from all sessions in the GN condition that were selected for IOA, her IOA for this condition is unavailable.
3.1.1 Accuracy of Lecture Notes

3.1.1.1 Guided Notes (GN). Two graduate students collected interobserver agreement (IOA) data on 42.9% (three out of seven) of lecture sessions that used guided notes (GN). During the GN condition, IOA on the accuracy of lecture notes for all students ranged from 90% to 100% with a mean of 99%.

3.1.1.2 Guided Notes Study Cards (GNSC). Two graduate students collected interobserver agreement (IOA) data on 42.9% (three out of seven) of lecture sessions that used guided notes study cards (GNSC). During the GNSC condition, IOA on the accuracy of lecture notes for all students was 100% in all sessions.

3.1.2 Next-Day Quiz Scores

3.1.2.1 Guided Notes (GN). Two doctoral students collected interobserver agreement (IOA) data on 42.9% (three out of seven) of quiz sessions that followed a lecture with the GN. During the GN condition, IOA on the quiz scores for all students ranged from 80% to 100% with a mean of 96.7%.

3.1.2.2 Guided Notes Study Cards (GNSC). Two doctoral students collected interobserver agreement (IOA) data on 42.9% (three out of seven) of quiz sessions that followed a lecture with the GNSC. During the GNSC condition, IOA on the quiz scores of all students ranged from 80% to 100% with a mean of 96.5%.
<table>
<thead>
<tr>
<th>Student</th>
<th>Guided Notes (GN)</th>
<th>Guided Notes Study Cards (GNSC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range (%)</td>
<td>Mean (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>100 (1)</td>
<td>100 (1)</td>
</tr>
<tr>
<td>2</td>
<td>90-100</td>
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<td>90-100</td>
<td>96.7</td>
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<tr>
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</tr>
<tr>
<td>5</td>
<td>100</td>
<td>100</td>
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<td>90-100</td>
<td>96.7</td>
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<td>-</td>
<td>-</td>
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<tr>
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<td>100</td>
</tr>
<tr>
<td>12</td>
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<td>100 (2)</td>
</tr>
<tr>
<td>13</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>14</td>
<td>100 (2)</td>
<td>100 (2)</td>
</tr>
<tr>
<td>15</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3.1: Ranges and means of percentages of IOA on the accuracy of lecture notes for each student across all conditions of the study.

Notes. Figures in parentheses indicate the number of sessions from which the IOA data were obtained. When not specified with parentheses, the numbers of sessions used for IOA were three.
<table>
<thead>
<tr>
<th>Student</th>
<th>Guided Notes (GN)</th>
<th>Guided Notes Study Cards (GNSC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range (%)</td>
<td>Mean (%)</td>
</tr>
<tr>
<td>1</td>
<td>80-100</td>
<td>93.3</td>
</tr>
<tr>
<td>2</td>
<td>90-100</td>
<td>93.3</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>80-100</td>
<td>93.3</td>
</tr>
<tr>
<td>5</td>
<td>90-100</td>
<td>96.7</td>
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<tr>
<td>6</td>
<td>100</td>
<td>100</td>
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<tr>
<td>7</td>
<td>100</td>
<td>100</td>
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<tr>
<td>8</td>
<td>90-100</td>
<td>96.7</td>
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<tr>
<td>9</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>90-100</td>
<td>96.7</td>
</tr>
<tr>
<td>12</td>
<td>90-100 (2)</td>
<td>95 (2)</td>
</tr>
<tr>
<td>13</td>
<td>80-100</td>
<td>93.3</td>
</tr>
<tr>
<td>14</td>
<td>100 (1)</td>
<td>100 (1)</td>
</tr>
<tr>
<td>15</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3.2: Ranges and means of percentages of IOA on next-day quiz scores for each student across all conditions of the study.

Notes. Figures in parentheses indicate the number of sessions from which the IOA data were obtained. When not specified with parentheses, the numbers of sessions used for IOA were three.
3.2 Accuracy of Lecture Notes

Next section reports the mean percentages of the accuracy of the lecture notes for individual student across phases and conditions. The whole-class mean percentages of the accuracy of the lecture notes across phases and conditions will also be presented. The GN contained ten blanks during the sessions 1 to 3, whereas from 4th sessions and after contained 15 blanks. Lecture notes of all students were not collected on session 5 of the GNI phase due to the shortage of class time.

3.2.1 Results for Individual Student

3.2.1.1 Student 1. Student 1 was present for all 17 sessions, but there were 6 sessions from which his lecture notes were not collected because he forgot to hand in his lecture notes in the following session. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 1 continued to record notes with high accuracy (range, 95 - 100%). Incorrect responses were observed only during the first GN phase and included copying a different word (a word that was written next to the target word).

3.2.1.2 Student 2. Student 2 was present for 16 of the 17 sessions. One session from the first GN phase is missing because he was absent. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 2
continued to record lecture notes with high accuracy (range, 97-100%). His mean accuracy during the GN1 phase was 97%, and during the GNSC TRNG phase was 98%. His incorrect responses included copying a different word (a word that was written next to the target word).

3.2.1.3 Student 3. Student 3 was present for 16 of the 17 sessions. She was absent in one of the 3 sessions in the guided notes study cards training (GNSC TRNG) phase, and also forgot to hand in her lecture notes in 1 session from the first GN phase. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 3 continued to record notes accurately across all phases with a mean of 100%.

3.2.1.4 Student 4. Student 4 was present for all 17 sessions. She did not hand in her lecture notes in one session from each GN1, GNSC1 and GNSC2 phases. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 4 continued to record notes with high accuracy (range, 98-100%). Incorrect responses were recorded only in the GNSC TRNG phase, which produced the mean of 98%. Her errors included copying a different word (a word that was written next to the target word).
3.2.1.5 Student 5. Student 5 was present for 15 of the 17 sessions. Because he was absent for two sessions in the GNSC2 phase, Student 5 has an ABA design. He forgot to hand in his lecture notes in two sessions in the GNSC1 phase. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 5’s mean lecture notes accuracy across phases ranged from 98 % to 100%. Incorrect responses were recorded only in the GNSC TRNG phase and included copying a different word (a word that was written next to the target word).

3.2.1.6 Student 6. Student 6 was present for all 17 sessions. He forgot to hand in his lecture notes in total of 2 sessions in the GNSC TRNG and 1 from the GNSC1 phases. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 6’s mean lecture notes accuracy across phases ranged from 93 to 100%. Incorrect responses were recorded only in the GN1 phase and included copying a different word (a word that was written next to the target word).

3.2.1.7 Student 7. Student 7 was present for 15 of the 17 sessions. For the first two sessions in the first GN phase, he came in late due to school volunteer work and did not take the quizzes, although he was present for the lectures. In 1 session of the GNSC1 phase, he forgot to hand in his lecture notes. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 7’s mean lecture
notes accuracy across phases ranged from 98 to 100%. Incorrect responses were recorded only in the GNSC1 phase and included copying a different word (a word that was written next to the target word).

3.2.1.8 Student 8. Student 8 was present for all 17 sessions, and continued to hand in all his lecture notes. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 8 continued to record notes accurately across all phases with a mean of 100% accuracy.

3.2.1.9 Student 9. Student 9 was present for 16 of 17 sessions. In 1 session from each GNSC phases, she forgot to hand in her lecture notes. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 9 continued to record notes accurately across all phases with a mean of 100%.

3.2.1.10 Student 10. Student 10 was present for 14 of the 17 sessions. She was absent in 2 sessions in the first GN phase and 1 session in the second GN phase. She also forgot to hand in her lecture notes in 1 session from each GN1 and GNSC TRNG phases. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 10 continued to record lecture notes accurately across all phases with a mean of 100%.

3.2.1.11 Student 11. Student 11 was present for all sessions. However, she forgot to hand in her lecture notes in 1 of the sessions in the GNSC2 phase. Table 3.3 shows
mean percentages of correct response for each student’s lecture notes across phases.

Student 11 continued to record notes accurately across all phases with a mean of 100%.

3.2.1.12 **Student 12.** Student 12 was present for 15 of the 17 sessions. She was absent in 1 of the GNSC1 and GN2 phases, and she forgot to hand in her notes in 1 session of the GNSC TRNG phase, 2 sessions of the GNSC1 phase, and 1 session of the GNSC2 phase. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 12 continued to record notes accurately across all phases with a mean of 100%.

3.2.1.13 **Student 13.** Student 13 was present for 14 of the 17 sessions. Because she was absent for two sessions in the GNSC2 phase, Student 13 has an ABA design. She was also absent in 1 of the sessions in the GNSC TRNG phase, and did not hand in her lecture notes in 1 of the sessions in the GNSC TRNG condition. Table 3.3 shows mean percentages of correct response for each student’s lecture notes across phases. Student 13’s mean lecture notes accuracy ranged from 93 to 100%. Incorrect responses were recorded in the GN1 phase, which produced the mean of 93%, in the GNSC TRNG phase, which produced the mean of 93%, and in the GNSC1 phase, which produced the mean of 99% accuracy. Her errors included copying a different word (a word that was written next to the target word) or copying a different numeral.
3.2.1.14 **Student 14.** Student 14 was present for 15 of the 17 sessions. He was absent from 1 session in both GNSC1 and GN2 phases. Table 3.3 shows mean percentages of correct response for each student's lecture notes across phases. His percentage of accuracy of lecture notes during the GN1 phase is significantly lower compared to other phases. This low mean accuracy score was obtained due to one of the sessions of the GN1 phase that lowered the mean score for this phase. In this session the teacher removed him from the entire class activity. Although he was present in the class he did not participate in any of the activities that took place during the class time, resulting in 0% accuracy of lecture notes for his day. He continued to record lecture notes accurately with 100% accuracy in other sessions of all phases (mean range, 75 – 100%).

3.2.1.15 **Student 15.** Student 15 was present for all 17 sessions, and continued to hand in her lecture notes. Table 3.3 shows mean percentages of correct response for each student's lecture notes across phases. Student 15 continued to record notes accurately across all phases with a mean of 100%.

3.2.2 *Class Summary of Accuracy of Lecture Notes*

As a class, participants recorded lecture notes accurately across phases. The class mean accuracy percentages were 97%, 99%, 99%, 100%, and 100% for each GN1, GNSC TRNG, GNSC1, GN2, GNSC2 phases, respectively (Table 3.3). Incorrect
responses made by the participants were observed mostly in the GN1 and GNSC TRNG phases, and involved copying a different word (a word that was written next to the target word) or copying a different numeral.

<table>
<thead>
<tr>
<th>Student</th>
<th>GN1</th>
<th>GNSC TRNG</th>
<th>GN2</th>
<th>GNSC2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>100 (2/3)</td>
<td>100 (1/5)</td>
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<td>100 (4/4)</td>
<td>100 (3/3)</td>
<td>100 (5/5)</td>
<td>100 (2/2)</td>
</tr>
</tbody>
</table>

Table 3.3: Mean percentages of correctly recorded lecture notes for each student and the whole class across all phases of the study.

Notes. Numbers were rounded by the first decimal place.
Figures in parentheses represent the actual number of sessions from which the student’s lecture notes were collected (left to the slash) and the total number of sessions in the phase (right to the slash).

\(^a\) = involves a session from which Student 14 was removed from the entire class activity.
3.3 Next-Day Quiz Scores

Next section reports the next-day quiz scores of the individual student and the whole class across phases and conditions. Figures 1 through 15 represent individual student’s quiz scores across phases, and table 3.4 shows mean quiz scores of individual student for each phase and condition. For the first 4 sessions (quizzes 1 through 4), the lecture notes from which the quizzes were made contained 10 blanks. That is, 10 questions were directly made from the 10 target words from the previous day’s lecture notes, even though the quiz items were randomly sequenced. The 12th session in the GNSC1 phase, which was marked as “tornado drill”, was considered to be different from the other sessions because the teacher and the students were distracted during the lecture and the 5-minute review due to a tornado drill that followed the 9th period class.

3.3.1 Individual Student’s Results

3.3.1.1 Student 1. Student 1 participated in all 17 quiz sessions. Figure 3.1 shows Student 1’s next-day quiz scores across phases. During the first GN phase (GN1), Student 1 scored 3 to 5 on the next-day quizzes, with a mean score of 3.8. When the guided notes study card training phase (GNSC TRNG) began, his scores increased to 7.3 in average (range 7 to 8), resulting in 3.5 points or 48% of increase compared to the GN1 phase. During the GNSC phase, student 1 increased the mean score of his next-day score to 8.8 (range 8 to 10). This was a 5 point- or 57% increase compared to the GN1
phase. When the phase was reversed back to the GN phase (GN2), Student 1’s mean score dropped to a mean of 1 (range 0 to 2). During the second GNSC phase (GNSC2), Student 1’s quiz scores increased again, to a mean of 8.5 (range 8 to 9).

3.3.1.2 **Student 2.** Student 2 participated in 14 of the 17 quiz sessions. Figure 3.2 shows student 2’s next-day quiz scores across phases. On the fifteenth session, student 2’s quiz sheet was lost after being collected along with other assignments for the social studies teacher. During the GN1 phase, student 2 scored on average of 5.33 (range 4 to 7). Introduction of GNSC TRNG resulted in an increase of next-day quiz scores, with 9 out of 10 in three consecutive quizzes during the training phase. In the GNSC1 phase, Student 2’s next-day quiz scores averaged 6.4, with a range of 4 to 9. Withdrawal of study cards in the GN2 phase produced a mean score of 7, a score which is at the same level as those obtained at the end of GNSC1 phase. The GNSC 2 phase produced an upward trending, ranging from 6 to 8 with mean of 7.

3.3.1.3 **Student 3.** Student 3 participated in 16 of the 17 quiz sessions. She was absent in session 8 of the guided notes study cards training (GNSC TRNG) phase. Figure 3.3 shows student 3’s next-day scores across phases. Quiz scores of student 3 remained variable throughout the duration of the study. During the GN1 phase, her quiz scores averaged 5.2, with a range of 4 to 8 out of ten. The GNSC TRNG phase produced a descending trend in the next-day quiz scores, starting from 7 correct responses and
dropping to 4 correct responses in the next session (Mean, 5.5; range, 4 to 7). Her performance remained variable in the GNSC1 phase. The number of correct responses during this phase ranged from 2 to 9 out of 10, with a mean of 5.2. This mean score was the same for the GN1 phase. The GN2 phase produced descending trend. The number of correct responses during this phase averaged 5.0, with a range of 4 to 6. The GNSC2 phase also produced a descending trend. Student 3’s number of correct responses during this phase averaged 7.5, with a range of 5 to 7 correct responses.

3.3.1.4 Student 4. Student 4 participated in all 17 quiz sessions. Figure 3.4 shows Student 4’s next-day quiz scores across phases. During the GN1 phase, student 4’s next-day quiz performance showed a descending trend, with a mean of 5.2 and a range of 3 to 8 out of 10. When the phase was shifted to the GNSC TRNG, her correct responses increased to a mean of 8.7 and a range of 7 to 10. In the GNSC1 phase, her next-day quiz scores decreased a little to a mean of 5.6 correct responses, with a range of 5 to 7, although less variability was observed compared to the GN1 phase. In the GN2 phase, her scores dropped further, but showed an upward trending. Her quiz scores during this phase averaged 4.5 correct responses with a range of 4 to 5. In the GNSC2 phase, student 4’s next-day quiz scores increased and showed an upward trend. Her quiz scores during this phase averaged 8.0, with a range of 6 to 10.
3.3.1.5 Student 5. Student 5 participated in 15 of the 17 quiz sessions. Because he was absent for two sessions in the GNSC2 phase, Student 5 has an ABA design. Figure 3.5 shows Student 5’s next-day quiz scores across phases. During the GN1 phase, his next-day quiz scores showed a descending trend, dropping from 10 to 5 correct responses, with a mean of 7.2. In the GNSC TRNG phase, his next-day quiz scores increased and stabilized at the mean of 9.3 and a range of 9 to 10. In the GNSC1 phase, the quiz scores showed a relatively stable level of performance except for an outlier at the session 12. Student 5’s next-day quiz scores during this phase averaged 8.2, with a range of 3 to 10. In the GN2 phase, his next-day quiz scores dropped in level but showed an increasing trend. His scores averaged 5.0, with a range of 4 to 6 correct responses. Student 5 was absent in the two sessions for GNSC2 phase.

3.3.1.6 Student 6. Student 6 participated in all 17 quiz sessions. Figure 3.6 shows Student 6’s next-day quiz scores across phases. His next-day quiz scores remained variable across phases. During the GN1 phase, Student 6 performed with a descending trend at a mean of 5.0, with a range of 3 to 7 out of 10. In the GNSC TRNG phase, his next-day quiz scores showed an upward trend, with a mean of 5.0 and a range of 3 to 7 correct responses. In the GNSC1 phase, his next-day quiz scores varied from 1 to 9, with a mean of 4.8 out of 10. Although the GNSC1 phase produced two days on which Student 6 scored over 80 % on the quizzes, variability in his scores evened out these two
good days. During the GN2 phase, Student 6’s next-day quiz score showed a descending
trend, with a mean of 2.5 and a range of 2 to 3 correct responses. During the GNSC2
phase, his next-day quiz scores increased a little compared to the previous GN2 phase,
although with a steep descending trend. His scores averaged 3.0, with a range of 1 to 5
correct responses.

3.3.1.7 Student 7. Student 7 participated in 15 of the 17 quiz sessions. For the
first two sessions in the first GN phase, he came in late due to school volunteer work and
did not take the quizzes, although he was present for the lectures. Figure 3.7 shows
Student 7’s next-day quiz scores across phases. During the GN1 phase, his next-day quiz
scores were at mid-level and stable, with a mean of 5.7 and a range of 5 to 6 out of 10.
During the GNSC TRNG phase, Student 7 showed an upward trend in his quiz scores.
His scores started from 4 and went up to 9 out of 10, with a mean of 6.3 correct
responses. In the GNSC1 phase, he showed more variable level of performance. His quiz
scores during this phase ranged from 4 to 10, with a mean of 6.0 out of ten. In the GN2
phase, Student 7’s next-day quiz performance showed a descending trend, starting from 6
correct responses to 4 on the following session (mean, 5.0). In the GNSC2 phase,
Student 7’s correct responses increased in the level (mean of 8.5), but still showed a
descending trend.
3.3.1.8 **Student 8.** Student 8 participated in all 17 quiz sessions. Figure 3.8 shows Student 8’s next-day quiz scores across phases. During the GN1 phase, Student 8’s next-day quiz performance was variable but had a descending trend, with an average of 7.8 and a range of 6 to 10 correct responses.

In the GNSC TRNG phase, Student 8’s next-day quiz performances had less variability and had an upward trend, with a mean of 8.7 and a range of 8 to 10. During the GNSC1 phase, his quiz scores were stable at high level, with a mean of 9.8 and a range of 8 to 10 out of 10. In the GN2 phase, Student 8’s performance level dropped great deal, although with an upward trending. His next-day quiz scores during this phase averaged 2.5, with a range of 0 to 5. In the GNSC2 phase, Student 8’s quiz scores increased again, but had a steep descending trend, with an average of 8.0 and a range of 6 to 10.

3.3.1.9 **Student 9.** Student 9 participated in 16 of the 17 quiz sessions. Figure 3.9 shows Student 9’s next-day quiz scores across phases. Her quiz scores remained variable across all phases. During the GN1 phase, Student 9 showed a variable performance, with a mean of 5.5 and a range of 3 to 9 out of 10. In the GNSC TRNG phase, she showed an upward trend in her quiz scores, starting from 7 and increased to 10 out of 10 in the three sessions. Her mean score during this phase was 8.3. In the GNSC1 phase, Student 9’s next-day quiz scores remained variable, although at slightly higher level than during the
GN1 phase. Her scores in this phase ranged from 2 to 10, with a mean of 6.0. In the GN2 phase, her scores decreased and showed a descending trend, starting at 4 and dropping to 2 out of 10, with a mean of 3.0. In the GNSC2 phase, Student 9's next-day quiz scores were identical to the one in the GN2 phase. Her quiz scores during this phase started at 4 and dropped to 2, with a mean of 3.0 out of 10.

3.3.1.10 Student 10. Student 10 participated in 14 of the 17 quiz sessions. Figure 3.10 shows Student 10's next-day quiz scores across phases. During the GN1 phase, Student 10 showed a descending trend in her quiz scores, starting from 8 and dropping to 3 out of 10 in the fifth session (mean, 5.7). In the GNSC TRNG phase, however, her scores increased and stabilized, with a range of 8 to 10 and a mean of 8.7 out of 10. In the GNSC1 phase, Student 10's scores showed a variable but slightly higher level of performance compared to the GN1 phase, with a mean of 6.4 and a range of 5 to 9. During the GN2 phase, she scored 7 out of 10 in a quiz she participated. In the GNSC2 phase, Student 10's next-day quiz scores were stable and high. She scored 10 in two consecutive sessions.

3.3.1.11 Student 11. Student 11 participated in 14 of the 17 quiz sessions. She did not take quizzes on sessions 1, 12, and 16 because she came in late due to school volunteer work. Figure 3.11 shows Student 11's next-day quiz scores across phases. During the GN1 phase, Student 11's next-day quiz scores showed a steep declining trend,
starting from 10 and ending at 6 out of 10 (mean, 8.25). In the GNSC TRNG phase, her performances were stable and at high level, getting 10 correct responses in three consecutive quiz sessions. In the GNSC1 phase, her scores were again stable and at high level, except for an outlier recorded on session 13 (mean, 9.25; range 7 to 10 out of 10). In the GN2 phase, she showed an upward trend, with a range of 9 to 10 and a mean of 9.5 correct responses. In the GNSC2 phase, her next-day quiz score dropped from near-perfect scores in the previous phase to 6 out of 10.

3.3.1.12 Student 12. Student 12 participated in 15 of the 17 quiz sessions. Figure 3.12 shows Student 12’s next-day quiz scores across phases. During the GN1 phase, her next-day quiz scores were at relatively high level, with a mean of 7.8 out of 10. In the GNSC TRNG phase, Student 12’s quiz scores increased except for an outlier on session 7, in which she forgot to bring her study cards. Her performance during this condition averaged 7.0, with a range of 2 to 10 correct responses. The GNSC1 phase produced a variable level of performance. Her next-day quiz scores during this phase averaged 7.75, with a range of 5 to 9 correct responses. In the GN2 phase, she participated in only 1 session and scored 6 out of 10. In the GNSC2 phase, her quiz scores dropped further, with a descending trend of 6 to 3 out of 10 (mean, 4.5).
3.3.1.13 Student 13. Student 13 participated in 14 of the 17 quiz sessions. Because she was absent for the last two sessions during the GN1C2 phase, her experimental design was an ABA design. She was also absent in 1 of the sessions in the GN1C TRNG phase. Her quiz score for the session 1 is not available because she came in late due to school volunteer work. Figure 3.13 shows Student 13’s next-day quiz scores across phases. During the GN1 phase, she showed a variable but descending trend on the next-day quiz scores, with a range of 5 to 8 and a mean of 6.0 out of 10. In the GN1C TRNG phase, her quiz scores increased from 6 to 10 correct responses, with a mean of 8.0. In the GN1C1 phase, her next-day quiz scores were stable at high level, with a mean of 9.6 and a range of 9 to 10 out of 10. The GN2 phase produced a steep descending trend in her quiz scores, starting from 9 and ending with 5 out of 10, with a mean of 7.0. The GN1C2 phase was not implemented with Student 13 because of absence.

3.3.1.14 Student 14. Student 14 participated in 15 of the 17 quiz sessions. His quiz scores for sessions 2 and 3 are not available because the teacher removed him from the entire class session on the second day of the GN1 phase. Due to this arrangement, he did not take the second test, did not record lecture notes during the session 2, and therefore, lost opportunity to take the third quiz. Figure 3.14 shows Student 14’s next-day quiz scores across phases. During the GN1 phase, Student 14’s next-day quiz
scores were stable, with a mean of 7.7 and a range of 7 to 8 out of 10. In the GNSC TRNG phase, his next-day quiz scores shifted at higher level, with a range of 9 to 10 and a mean of 9.7. In the GNSC1 phase, he performed at high level except for an outlier on session 12. Student 14’s quiz scores during this condition ranged from 5 to 10, with a mean of 8.5 out of 10. In the GN2 phase, his quiz scores decreased to 6 out of 10. In the GNSC2 phase, his quiz scores slightly increased to 7 out of 10 in two consecutive sessions.

3.3.1.15 Student 15. Student 15 participated in all 17 quiz sessions. Figure 3.15 shows Student 15’s next-day quiz scores across phases. During the GN1 phase, her next-day quiz scores ranged from 7 to 10, with a mean of 8.8 out of 10. In the GNSC TRNG phase, her next-day quiz scores showed an upward trend, starting from 8 and ending with 10 out of 10 (mean, 8.7). Although the mean score during this condition was slightly lower compared to the GN1 phase, there was less variability. The GNSC2 phase again produced a variable picture, with a range of 7 to 10 and a mean of 8.8. The GN2 phase showed a stable performance at a lower level. Student 15 scored 6 out of 10 in two consecutive sessions during this phase. The GNSC2 phase resulted in stabilized performance at a high level. Her next-day quiz scores were 10 out of 10 in two consecutive sessions during this phase.
Figure 3.1. Next-day quiz scores for Student 1 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.

Figure 3.2. Next-day quiz scores for Student 2 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
Figure 3.3. Next-day quiz scores for Student 3 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.

Figure 3.4. Next-day quiz scores for Student 4 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
Figure 3.5. Next-day quiz scores for Student 5 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.

Figure 3.6. Next-day quiz scores for Student 6 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
Figure 3.7. Next-day quiz scores for Student 7 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.

Figure 3.8. Next-day quiz scores for Student 8 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
Figure 3.9. Next-day quiz scores for Student 9 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.

Figure 3.10. Next-day quiz scores for Student 10 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
Figure 3.11. Next-day quiz scores for Student 11 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.

Figure 3.12. Next-day quiz scores for Student 12 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
Figure 3.13. Next-day quiz scores for Student 13 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.

Figure 3.14. Next-day quiz scores for Student 14 during each phase of the study Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
Figure 3.15. Next-day quiz scores for Student 4 during each phase of the study. Notes. * = Tornado drill. For the first three sessions, the lecture notes contained 10 blanks.
3.3.2 Summary of Individual Student's Results

3.3.2.1 Accuracy of Lecture Notes. Students continued to record their notes accurately. The mean percent correct of their lecture notes ranged from 75 to 100%. The lowest percentage was obtained under a special occasion, when Student 14 was removed from the class activities. Except for this occasion, accuracy of students' lecture notes was over 90%. Incorrect responses composed of copying a word that was next to the target word and writing a different figure (e.g., 400 instead of 4000). The occurrences of errors or no responses decreased as the sessions continued.

3.3.2.2 Next-Day Quiz Scores. Table 3.4 shows individual student's mean quiz scores across phases and conditions. Seven students (Students 1, 4, 5, 7, 8, 10, and 13) scored significantly higher in the GNSC conditions over the GN conditions. Three students (Students 2, 3 and 15) also scored higher in the GNSC conditions, although Student 2's mean scores of the GN2 and GNSC2 phases were the same, and Students 3 and 15 had the same mean scores for the GN1 and GNSC1 phases. For Students 11 and 14, the mean scores showed no particular trend. Three students (Students 6, 9, and 12) decreased their mean scores as the phases progressed.
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Table 3.4: Mean quiz scores across phases and conditions for individual student

Notes. $^a$ = GNSC TRNG phase excluded from the GNSC condition.

Numbers in parentheses indicate the number of sessions the student participated.

Typically, each condition contained the following number of sessions:

- First GN (guided notes): 5 sessions,
- First GNSC (guided note study cards): 5 sessions,
- Second GN: 2 sessions,
- Second GNSC: 2 sessions
3.4 Group Summary of Next-Day Quiz Scores

In this section, class mean scores of next-day quizzes across phases are presented. Next, a group comparison will be made between phase-by-phase mean scores of two groups of students. The two groups are general education (N=12) and special needs (N=3). The special needs group consists of three students (Students 1 through 3), whereas general education group contains the rest of the students.

3.4.1 Group Means

Figure 3.16 shows the whole-class mean scores of next-day quizzes across phases. Although variable, the mean for the whole class next-day quiz score during the GN1 phase was 6.5, with a range of 5.3 to 7.8 out of 10. During the GNSC TRNG phase, the mean next-day quiz scores for the whole class increased to a mean of 8.1, with a range of 7.1 to 9.1 out of 10. In the GNSC1 phase, the mean scores showed greater variability than the previous GN1 and GNSC TRNG phases, with a mean of 7.3 and a range of 5.9 to 9.2 correct responses. The GN2 phase produced relatively stable but lower level of performance in the means scores, with a mean of 5.0 correct responses. The GNSC2 phase produced higher level of performance with a descending trend. The mean number of correct responses during this condition was 7.0.
Figure 3.16. Mean next-day quiz scores for the whole class across phases (N=15)

Note. * = the tornado drill that happened right after the lecture on session 12.
3.4.2 Group Comparison

3.4.2.1 Guided Notes 1 (GN1). During the GN1 phase, the mean quiz scores of the general education students showed a descending trend while the mean scores of the special needs students were relatively stable. The mean score of the general education students during this condition was 7.1, indicating that they scored about 7 correct out of 10 questions, while the mean obtained from the students with special needs was 4.6, indicating that those students with special needs scored 4 to 5 questions correct on average. The biggest discrepancy between the two groups observed during this condition was 4.6, which was recorded on Session 2. The general education students scored approximately 2 points more than the special needs students throughout this phase.

3.4.2.2 Guided Notes Study Cards Training (GNSC TRNG). In the GNSC TRNG phase, both groups increased the number of correct responses and the difference between the two groups became smaller (0 to 1.4 points). General education students during this phase showed an ascending trend with a mean of 8.3 out of 10, indicating that the general education students scored approximately one point more compared to the GN1 condition. The special needs students' scores were stable but were at higher level by approximately 3 points (mean, 7.6 points) compared to the previous GN1 phase.
3.4.2.3 Guided Notes Study Cards (GNSC1). On the first session (Session 9) of the GNSC1 phase, both groups of students scored lower than during the GNSC TRNG phase. Both groups, however, showed a sharp ascend, which was followed by a sharp decline and another ascend. The general education students during this phase scored 7.6 on average, a score which is slightly higher than the mean score obtained during the GN1 phase. The scores of students with special needs during this phase averaged 6.8, about 2 points above their mean score obtained in the GN1 phase. Notably, students with special needs scored higher than the general education students in two of the five quiz sessions (sessions 12 and 13) in this phase.

3.4.2.4 Guided Notes (GN2). In the GN2 phase, students with special needs showed a steep decline from the previous phase and within the phase, with a mean of 3.5 in this phase. The general education students’ scores were stable, with a mean of 5.4. Both groups performed at the lowest level among all phases. However, the general education students scored approximately 2 points more than the special needs students.

3.4.2.5 Guided Notes Study Cards (GNSC2). Upon re-introduction of the GNSC in the GNSC2 phase, both groups’ scores increased again. The general education students’ scores for the two sessions averaged 7.0, a score which is slightly lower than the one obtained in the GNSC1 phase. The students with special needs, on the other hand, scored higher than the general education students in two consecutive sessions. The mean
score obtained from the students with special needs during this phase was 7.7, and this was the highest of all phases, indicating that the special needs students scored approximately 1 point more than the general education students.

Figure 3.17. Mean next-day quiz scores for each group across phases

Notes. Closed dots = mean scores for general education students (GEN ED). Open dots = mean scores for special needs students (SPEC ED).
* at the 12th session indicates the tornado drill that happened right after the lecture
3.5 Students’, Teacher’s, and Student Aides’ Opinions

3.5.1 Students’ Opinions and Preferences

Students’ opinions were obtained from 13 of the 15 participants, because Students 11 and 12 were absent on the day the interviews were given.

Twelve of the 13 students said they preferred the GNSC better than the GN. Students indicated that the GNSC were easier to study with (Students 3, 7, 8, 9, 13 and 15), because they could focus on one question at a time and did not have to read the whole notes (Student 10 and 14), that the GNSC review was more fun because it was like a game (Students 2 and 10), and that they liked the challenge of getting more questions right (Students 7 and 10). Students 1 and 5 answered that with GNSC, they knew “what to do” to study for the quiz.

About the GN, Students 2 and 4 indicated that it was boring to review the guided notes. Students 1 and 10 said GN took longer to study. Students 1 and 5 stated that they did not know what to do with the GN when they were reviewing. Student 4 said she did not prefer one way or the other, because GN was boring and GNSC was “pointless”, given that the answers to the questions were always the words left in the blanks.

Nine of the 13 students said they preferred the GNSC as a means of note taking, while 2 of the 13 students (Students 7 and 15) said they preferred the GN and 1 students
(Students 5) said both procedures were about the same. Those students who preferred the GNSC indicated that they were easier to follow because each card contained information that appeared in a slide. Students who preferred the GN said that the GNSC were sometimes confusing because they had to go back and forth among cards.

Five of the 13 students said they studied their GN outside of social studies classroom. Four students said they reviewed their notes at home, and one student said he studies them during the flex period. Those students who studied their GN outside of social studies classroom spent 10 to 20 minutes reviewing it. 5 students explicitly indicated that they did not review their GN outside of social studies classroom after the five minute review at the end of the 9th period class.

Twelve of 13 students said they studied the GNSC outside of social studies classroom, either at home or during the study hall period. 5 of the 12 students said they spent 5 minutes studying the cards, 3 students said they spent 5 to 10 minutes, 3 students said they spent 10 to 15 minutes, and 1 student said he spent 20 minutes. They studied the study cards repetitively, and two students said they made piles of correct and incorrect cards as they would have done during the 5-minute review in the social studies classroom. One student (Student 4) said she did not study the cards anywhere outside of social studies classroom.
Thirteen students indicated that the GNSC was easier to study and review for the quizzes. One student (Student 9) said that she liked GNSC because she could carry them around and study them at any time.

Also all 13 students said that the GNSC better prepared them for the quizzes compared to the regular guided notes.

For the GN, four students said they liked the guided notes as a mean of review for the quiz. One student (Student 4) said he didn’t really care one way or the other, seven students said they didn’t like the GN as a means of reviewing for the quiz, and one student said he really didn’t like the GN.

As for the GNSC, 12 of 13 students rated it positively. Eight students said they really liked the GNSC as a mean of reviewing for the quizzes, and three of the eight said that they would like to have the study cards next year in different classes. Four students said they liked having the guided note study cards, and one student (Student 4) said she did not care one way or the other, saying the GNSC were difficult to keep track of all cards.

3.5.2 Student Aides' Opinions

Interviews were given to Student 1 and Student 2's aides. Opinions of the Student 3’s sign language interpreter were not obtained because she was absent on the day of interview.
Student 1’s aides indicated that Student 1 was better able to keep track of information with the GNSC, with clearer expectations regarding which information he should know. As for Student 1’s behavior during the study time, she indicated that Student 1 reviewed the guided notes repetitively, and that he enjoyed the challenge of getting as many correct answers as he could or going through all the cards as quickly as he could. She also suggested that the guided note study cards facilitated Student 1’s learning since they provided some definite “hands-on” review activities.

Student 2’s aide indicated that Student 2 seemed more attentive to the lecture when he was using the GNSC. Specifically, the aides identified two behaviors: asking more questions to the social studies teacher and checking the accuracy of his notes with the aide. During the study time, the aide said that Student 2 did not seem to want to study the GN, while he seemed to enjoy studying the GNSC and more willing to study them. She also indicated that she liked both types of guided notes, because they enabled Student 2 to independently participate in the class activity.

3.5.3 Teacher’s Opinion

The social studies teacher stated that both types of guided notes were equally effective way to study for the quizzes, although the GNSC were sometimes hard to keep track of, because the study cards looked the same. He suggested that guided note study cards be kept with a key ring, so students could manage increasing number of cards. He
indicated that he saw Students 1, 2, and two other students who did not participate in the study studying the cards during the study hall period once or twice, using the same review procedure employed during the 5-minute study time. He also stated that he had seen other students studying them, but could not recall the name of the students. As for the GN, he indicated that he did not see any of the students studying the GN during the study hall period or anywhere outside of the social studies classroom. With respect to the quiz scores of the students, he indicated that Student 1 did better with the GNSC, but that the other students could have done better given their usual performance levels. He said he would definitely use the GN for the next year, but not sure if he would use the GNSC, because the procedure required the teacher to “lose too much (instructional) time” for the cutting, sorting and reviewing of the cards. He also expressed concern about the amount of time required for preparing the GNSC.
CHAPTER 4

DISCUSSION

This chapter evaluates and interprets the results of the study by comparing the effects of two types of guided notes on the accuracy of lecture notes and next-day quiz scores. The chapter begins with the description of the limitations of this study. Next, the results are analyzed with respect to the research questions and previous research of guided notes. Practical implications of the results of this study will be discussed, and some suggestions for future research are offered.

4.1 Limitations of the Study

4.1.1 Participants Characteristics

Due to a large number of participants (total of 15 participants), the study encountered many factors that could not be empirically controlled. First, absences among participants affected the research design for some of the students. For example, Student 5 and Student 13 participated no sessions during the second guided notes study cards
(GNSC2) phase. As a result, they lost a phase from the full research design. Other than these students, Student 7, 10 and 14 took fewer quizzes for their first guided notes (GN1) phase, making determination of their performance level within the phase difficult. Also, Student 11 participated in only one quiz session for GNSC2 phase, which made the interpretation of the data difficult. Student 12 and 14 participated only one quiz session for the second GN (GN2) phase.

Second, Student 12 reportedly experienced her parents’ divorce around the 13th session of the study. According to the social studies teacher, the change in her family status caused “psychological issues” to the student, which negatively affected her overall academic performances.

4.1.2 Length of the Study

The study, which was conducted over a 3-month period, took place while there were many school events and teacher’s absences. Despite the three months that were allowed for the study, the study did not have sufficient number of sessions especially after the reversal to the GN2 phase. This lack of collectable data limited the evidence upon which I could make strong conclusions about the research questions. Some examples of school events include two weeks of spring break which happened during the GN1 phase. Second, there was a field trip between the GNSC1 and the GN2 phases, and 9th period class was eliminated. Third, three days were devoted for the state-wide
proficiency tests. In addition to the school events, there were occasions in which the social studies teacher was absent and sessions were cancelled. For example, the teacher was called for jury duty during the spring break until a week after the end of spring break. On another occasion, the teacher took a sick leave. During the second GNSC phase, the teacher chaperoned a school field trip to Washington DC for four days. In all of these cases, no sessions were carried out. Given more time or had all these school events and teacher absences been controlled, the second GN and GNSC phases could be implemented longer, and students 3, 4, 6, 7, 8, 9, 11, and 12's data may have shown stability.

4.1.3 Length of Each phase

Due to the number of days lost from the study, varying the length of the phases was difficult. The first GN phase had five sessions, and the following GNSC phase also had five after 3 sessions devoted for the training. The second GN and the GNSC phases (GN2 and GNSC2) both had two sessions each. Ideally, the length of each condition should have been different from each other.

4.1.4 Session Length

The social studies teacher managed all the instructional procedures in the class. In other words, although the experimenter could control the main theme of lecture, the actual manner of presentation, amount of information covered in a session, or amount of
time allotted for a lecture were entirely subject to the teacher’s discretion. The length of sessions varied depending on the amount of information, school schedule, or other social studies projects. Also, the last four sessions of the study coincided with a school-wide event called “Academic Olympics.” During this time, the school functioned under a different schedule and the 9th period class was shortened to 33 minutes from 43 minutes.

4.1.5 Limitations with the Setting and Research Procedures

With respect to session length and duration of the study, the teacher controlled the amount of information covered in a lecture, the manner in which he would present the content, and pace of instruction. The 12th session, for this reason, was markedly different from other sessions. In this session there was a tornado drill scheduled right after the 9th period class. Consequently, both the lecture and the review session were conducted in a rapid pace. As a result, the atmosphere of the class remained disruptive throughout the class session and resulted in lower level of performances for most of the participants.

The amount of information also varied from session to session. When the teacher had a lot of information to cover, the pace of his presentation increased rapidly, and this could have hindered some of the students’ notetaking. The amount of information also affected the rate of students’ responding. With the total number of written responses kept the same across all phases (15 responses per session), students
had to passively listen to the lecture when the overall amount of information was robust. Related to the amount of information, the time required for preparing the GN or the GNSC was relatively long, varying from 15 to 40 minutes depending on the length of the presentation slides. However, it should be noted that the time required for preparation of the GN or the GNSC decreased as the sessions continued and the experimenter got used to it. The GN required 20 minutes at the initial stage of the study and decreased to 15 minutes in the last stage. The GNSC required 40 minutes at the initial stage but 20 minutes at the end.

Another consideration about guided notes is the selection of words to be left blank. In the present study, the experimenter selected the target words, which were left blank on students’ guided notes. Given an opportunity to consult with the social studies teacher regarding which words should be selected, the educational value of the notes may have been greater.

I frequently asked the teacher to remind students to study the day’s notes at home. Although he always made this announce to the class, the emphasis varied from session to session depending on the schedule. Although he always did announce that to the class, the emphasis varied from session to session depending on the schedule. For example, during the “Academic Olympics,” the teacher only said to study the notes at
home, while on other occasions he emphasized the relation between the notes and the quiz. Ongoing monitoring and assessment of the teacher’s behavior could have improved treatment integrity.

The contingency for the next-day quiz was another point of consideration. An extra point was awarded for a student who scored 10 out of 10 on a quiz. Those Students whose score was less than 10 received no extra points. In fact, 2 of the 15 students (Students 2 and 6) earned no extra points during the study. Although 13 students did earn some extra points, chances of getting extra points were low for the special needs students (Students 1 and 3) and other lower performing students (Table 4.1). The extra point system itself composed of so little portion of the students’ grade (17 possible points against entire 600 points) that quizzes were unlikely to affect the students’ grade in any functional way (e.g., advancing the final grade from C+ to B-). Furthermore, the teacher did not write comments on students’ quizzes, even though he consistently urged them to study their notes. This contingency did not appear to be powerful enough to maintain students’ motivation throughout the study. That is, students did not get any recognition of their performances until they got a perfect score. This may have affected students’ behaviors during the quiz. An informal observation revealed that the students generally spent about 90 seconds writing answers, and spent the rest of 5 minutes drawing on the back of the papers. They were not observed to “try hard” when they did not know the
answer for any given quiz question and left the item blank. Conversely, when the teacher assigned a unit test, students tended to study more for the test than the next-day quiz. The last two sessions of both the GNSC1 and GNSC2 phases were scheduled before a 50-item unit test, and the students’ scores were relatively low. There were no alliances between the next-day quizzes and the teacher-made unit tests. If the next-day quizzes had been closely linked to the unit tests, which consisted of major part of the students’ grade, the motivation of the students to study the cards may have been greater.

<table>
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<th>GNSC TRNG</th>
<th>GNSC1</th>
<th>GN2</th>
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</table>

Table 4.1: The number of extra points earned by each student in each phase of the study.
Students were allowed to take their notes home to study for the next-day quizzes. There was, however, no contingency that could ensure or monitor whether they actually studied their notes at home. Given the low level of motivation due to the strict nature of the extra-point awarding system, the probability of the students studying at home remained low. Session 12, for instance, showed significant decreases in most of the participants’ quiz scores. Session 12 was when there was a tornado drill scheduled after the class period and class was distracting. Students could, however, study their notes at home because they were allowed and encouraged to do so. The low performances of 9 of the 14 students (Student 11 was absent on session 12) indicate that those students did not study their notes at home. On the contrary, the four students (Students 1, 8, 13, and 15) who maintained or improved their high level of performance suggest that extra studying of study cards at home or during the flex (i.e., study hall) could compensate for insufficient study and review time.

Since the students were allowed to take their notes home, students’ notes had to be collected on the next day. With this procedure, the risks were higher that students lost their notes or forgot to bring them back to school. Also, with many school events simultaneously occurring, the teacher forgot to collect the notes on the fourth session. These factors combined, availability of the accuracy of the students’ lecture notes data were forced to rely solely upon the students’ and the teacher’s cooperation.
Students were required to review their notes independently and silently during the review sessions in the GN condition. For this reason, students did not make any observable behaviors during the GN review, as opposed to during the GNSC review, when they flipped the cards or placed the cards into two different piles. While they were looking at the notes and appeared to be studying, there was no actual indication that the students were in fact studying the notes. Informal observations of the students’ behaviors during the review sessions suggested that students were less attentive to the materials (i.e., guided notes) when study cards were not used. Their attention span lasted approximately 3 minutes, and students seemed distracted as the time passed. With the study cards, however, students were more attentive and continued reviewing the cards for five minutes. Several students went through the cards twice during the five minutes.

Long-term maintenance of the facts or generality of the study skills were not measured in this study. Time did not permit investigation of these outcomes.

4.1.6 Procedural Adaptations

For the first three sessions, the guided notes contained 10 blanks, which were then directly converted into next-day quiz questions. However, from the fourth session and after, the number of blanks in a set of guided notes was increased to the total of
fifteen, from which 10 were randomly selected for the next-day quiz. This adaptation was to ensure that students would not know exactly which items would appear on the quiz.

Due to a school event, the last four sessions took place under the shortened class period. In order to guarantee the lecture time, the quiz time was shortened from 5 minutes to 2 minutes for these four days. According to informal observations of the students taking their quizzes, they had continued to spend approximately 90 to 100 seconds to complete their quizzes prior to this change. Therefore, the 2 minutes were considered to be sufficient for students to complete the quiz, and students completed the quiz within this allocated period of time.

4.2 Research Questions

What are the comparative effects of guided notes (GN) and guided notes study cards (GNSC) on the accuracy of the lecture notes taken by 7th grade students in a social studies classroom?

The results of the accuracy of students' lecture notes suggest that students continued to complete their notes accurately in both GN and GNSC conditions throughout the study. This finding paralleled the findings of Hamilton et al. (2000), in which only the guided notes were used. Since errors were observed more often during the early phases of the study and decreased as the sessions continued, we can assume that
the students, who had already had experience with guided notes, got more used to using the guided notes during the course of the study. This study expanded the findings of previous studies by demonstrating that students were able to record information correctly on the guided notes when Power Point® slides were used and when a different form of guided notes (i.e., guided notes study cards) were used.

*What are the comparative effects of guided notes (GN) and guided notes study cards (GNSC) on the next-day quiz scores of 7th grade students in a social studies classroom?*

The results of this study generally favor the GNSC over the GN. Pados (1989), and Lazarus (1991, 1993) have demonstrated review of the guided notes could boost quiz scores of students at various age level and various characteristics, and this study extended their results by identifying an effective manner of reviewing. Studies by Lazarus (1991, 1993) served as basis for the review procedure used in the GN condition of this study, and students’ scores during this condition did not replicate the strong effects shown by the two previous studies. In this study, students’ mean scores during the GN1 phase ranged from approximately 5.6 to 8 out of ten (56 to 80%), and approximately 4.9 to 5.2 (49 to 52%) in the GN2 phase (Figure 3.17). On the contrary, Lazarus’s studies (1991, 1993) succeeded to produce greater than 70% scores for most of the participants with guided notes (GN) and review. Different results obtained in present
study may be accounted for the large amount of information covered in a lecture, lack of motivation of the students, or for the various school events that took place during this study.

Ten out of 15 students (Students 1, 2, 3, 4, 5, 7, 8, 10, 13, and 15) showed positive effects of GNSC over GN.

Student 1, who received special education services under ADHD and developmental disability categories, scored on the average of over 80% accuracy (8.8 correct responses in the GNSC1 phase and 8.5 in the GNSC 2 phase), whereas his scores during the GN condition averaged 3.8 in the GN1 phase and 1.0 in the GN2 phase. His scores during the GNSC condition surpassed the mean scores of students without disabilities in five of the seven sessions (Sessions 9, 12, 13, 16 and 17). He was frequently observed studying the cards with his aides during the study hall period, or stated that he had studied the cards at home. On one occasion, he said to the experimenter that he had studied the cards “four hundred times at home.” During the study cards review, the he seemed to enjoy challenging how many correct answers he could get out of the fifteen cards, and frequently reported his records to the experimenter (e.g., “I got 9 corrects this time!” “I know all the answers!”).

Student 2 showed moderate effects of GNSC over GN. His scores during the GNSC-TRNG were significantly higher than other phases, but the scores slightly
dropped when the training was withdrawn. The training sessions were unique compared to other phases, because the quizzes immediately followed the review without a 24-hour delay. Student performed well on immediate recall but did not seem to retain information long enough for the next-day quizzes. This observation may indicate a need for more effective review procedure that will lead to a longer-term maintenance of the learned content. In his case, motivation did not seem to interfere with his quiz performances. For example, he stated in the interview that he studied both types of guided notes at home. He appeared to enjoy the GNKC review sessions, For instance, he often cheered when he finished reviewing the cards, or reported the number of correctly reviewed cards (e.g., “I’m done now!” “I know all the answers now!”). Also, when the study cards review was first introduced, he exclaimed, “This is fun. It’s like a game!”

Student 3 showed moderate effects of GNKC and review over GN. Her low score on the 9th session may be attributed to her absence in the 8th session. Since 9th session was the first session after the GNKC TRNG was withdrawn, there was a change in the contingency. That is, during the training phase, students were given time to study their notes before the quiz, whereas that study time was not available from the 9th session. Since she was absent in the 8th session, she may not have been aware of the change. This may indicate that she did not study cards at home.
Student 4 did not have special learning needs. Her scores show moderately positive effects of GNSC over GN. Her mean score for the GN condition was 5.0 and the GNSC condition was 6.3 correct responses. Given that her final grade for the social studies was an A-, and that her scores during the GN1 phase dropped significantly from a B range (7/8 out of 10) to a F range (3 out of 10), her lack of motivation is suspected. During the interview, she was the only participant who answered that GNSC had “no point studying them”.

Student 5 showed clear positive effects of GNSC over GN. He was sometimes observed to be studying his cards before the class, and on one occasion he was studying the cards with his friend. His low score on the 12th session (tornado drill) may indicate that he did not really spend time studying the cards at home.

Student 7 showed moderate effects of GNSC over GN. His mean score of the GNSC1 phase was boosted by the full score he obtained in the 10th session, but scores of other quiz sessions were variable and inconsistent. Since he indicated that he studied the cards at home and also was witnessed studying them before class, his motivation does not seem to account for this variability.

Student 8 scored significantly higher when GNSC were used. His scores for the GN condition averaged 6.3, whereas the scores for the GNSC condition averaged 9.1. He scored 10 out of 10 on the 12th session (tornado drill), which supported his answer in the
interview that he studied cards at home. Given his final social studies grade was a B, the GNSC could be an effective supplemental study strategy for him. He was sometimes observed studying the cards before the class. I also observed that he repeatedly went over the cards during the study cards review sessions.

Student 10 showed positive effects of GNSC over GN. She described herself as a “slow reader” in the interview, and her final social studies grade was a B. Since she scored 10 out of 10 in all sessions in the GNSC2 phase, this could be an effective strategy to accommodate her needs in general education classrooms.

Student 13 scored higher when the GNSC were used. She was often observed talking out during the lecture and being reprimanded by the teacher, indicating her lack of motivation for the class as a whole. However, she answered in the interview that she studied the cards every night when there was a quiz next day, and she was frequently observed studying the cards before the class. This may indicate that the study cards provided her with an effective study strategy.

Student 15 generally scored high but her scores were higher when the GNSC were used. She answered in the interview that she did not study the GN outside the classroom, but studied the GNSC at home. Her scores support this statement, and her high scores in the last two sessions of the GNSC 2 phase may indicate that the review procedure was an effective one for her.
For two students (Students 11, and 14), there was no clear trend in the results. Student 11 was one of the highest performing students in the class, and her scores were relatively stable across all phases. End-of-the-school-year events and the unit-test may have contributed to her low score in the last session. Student 14’s performance was also relatively stable, except for the 12th session marked as the tornado drill. His lower scores for the GNSC2 phase may be attributed to the school events, although other unknown factors may be in effect.

For three students (Students 6, 9 and 12), quiz scores decreased as the sessions progressed. For Student 12, reported family issue may account for her performance, but no clear explanation is available for Students 6 and 9. Student 6, however, once forgot to bring his notes in the training session, and was observed to be playing with rubber bands during the study cards review session. Therefore, a motivational issue may be suspected.

*What are the students’ opinions about two procedures (GN and GNSC)?*

All students who participated in the interview preferred the GNSC as a means of preparing for the quizzes. Two students (Students 2 and 4) said that the GN review was boring, and others said that study cards reviews were more fun and like a game. This information provides social validity for ASR-rich instruction. Students clearly made
frequent explicit responses during the GNSC review sessions, including shuffling the cards, flipping the cards, or making two piles, while they made few observable responses during the GN review.

Twelve of the 13 students who participated in the interview answered that they studied the GNSC outside the classroom either at home or during the flex, whereas only 5 of the students indicated they studied the GN outside the classroom. Twelve of the 13 students positively rated the GNSC, by saying either he or she liked it or really liked it. Four students rated the GN positively and 8 students rated them negatively, either saying he or she did not like it or really did not like it. These results may support findings of Huffman and Spires (1994) study which suggested that with explicit skill instruction, students actually used the skills and showed a more positive attitude toward the skill. Since the GNSC review phase was proceeded by training sessions which depicted the five stages proposed by Huffman and Spires (1994), participants of this study may have used the strategy and showed positive attitudes toward the review procedure.

There were, however, gaps between students’ answers and their actual performances. For example, Students 6 and 9, who showed decreases in quiz scores as the sessions progressed, stated that they thought they had scored higher with the GNSC. Another discrepancy lay with the students’ accounts of extra studying and their actual performances. For example, even with 12 of the 13 students indicating that they studied
the cards at home, 12th session, which was characterized by distracted class atmosphere, produced sharp decrease in many students' quiz scores. Had they studied their cards outside the class, this may not have occurred. Since this study did not use a contingency to support extra studying, the extent of students' extra studying is not clear from the results of this study.

*What are the teachers' opinions about two procedures (GN and GNSC)?*

The social studies teacher and aides of Students 1 and 2 were interviewed. Student aides preferred guided note study cards (GNSC) as a means to prepare for the quiz, and commented that both types of guided notes were a good means to enable students to participate in the class.

The teacher indicated that both types of guided notes helped students prepare for quizzes, although he indicated that most of his students could have done better given their usual levels of performances. If this study had been more closely linked to the teacher's grade system, the teacher's rating and the students' actual performance may have been different. The teacher noted that GNSC seemed to take a lot of preparation time, and that ensuring the correct implementation of the review procedure was difficult, given the limited class period.
4.3 Implications for Practice

There were several occasions in which the students scored high on the quizzes even though the study time was limited. For example, Students 1, 8, and 15 scored 10 out of 10 on the 12th session, despite the disruptive class period brought about by the tornado drill. Student 1, 3, 4, 8, 10, and 15 performed at high levels on the next-day quizzes for the last two sessions, which coincided with a school event and a big unit test. These results suggested that these students studied their notes at home or outside the social studies classroom. Considering this point, if given a sufficient time to study their notes, the GNSC and the review procedure can be used as a supplemental study material even if the instructional time is limited. Also, considering Student 1’s high scores obtained exclusively with the GNSC, the study cards procedure may be a promising study skill to teach for students with special needs who are included in general education classrooms.

Students 1 and 2 both indicated in the interview that they studied both types of guided notes before the quiz, and their special education aides supported their statements. These students stated that they spent less time studying the GNSC than the GN, but they scored higher with the GNSC. These results suggest that GNSC can make greater gains in the students’ quiz scores with less time spent on review. Also the review procedure
with the GNSC does not involve teacher-lead review sessions. Because building a review
time in a class period is often difficult in many classrooms and for many teachers, GNSC
can save the time needed for implementing the review session.

The large amount of information to be covered in middle and high school
content area classrooms opens the possibility for another in-class activity using the study
cards. For example, instead of limiting the number of cards to 15 and “squeezing” too
many facts in a card, a teacher could limit the number of facts written on a card. By
doing this, there will be more than 15 cards if the lecture contains many facts or events.
Next, by not providing questions on the back of the cards, the students can make their
own study material by writing their own questions on the back. This could save teacher
preparation time. Students can work with peers as of a collaborative learning activity, or
independently at home as a part of homework. The principle of GNSC can be used not
only in the lecture situation, but also in other instructional situations. That is, the
information delivery medium should not be limited to lecture, but can and should be
expanded to other mediums such as reading materials, internet, or movies.

4.4 Suggestions for Future Research

4.4.1 Setting

This study was conducted exclusively in the 7th grade social studies classroom.
Systematic replications of this study could be done in different subject area classrooms
taught by other teachers. In order to avoid the participants’ losing their notes after taking their notes home, students’ notes should be photocopied following the review. For this reason, the room should be equipped with a copy machine or should be located close to a copy room. Other suggestions to avoid loss of students’ notes are discussed in the next section.

4.4.2 Materials

Some adaptations should be made in the form of the GNSC. Students tended to lose their notes more often in the GNSC condition. Although different colored papers were used and each card was numbered from 1 to 15, each card or “box” should be dated as an extra caution. Two students reported that the GNSC made the notetaking harder, because they had to go back and forth on a sheet of paper to find the right column. In order to address this concern, guided note study cards (GNSC) can be formatted differently so that there will be one column and 5 to 6 rows, in stead of two columns and 3 or 4 rows. With 5 to 6 rectangular “boxes” lined vertically, students will be able to follow the lecture from the top to the bottom without having to switch between the columns. In addition to the ease of following lectures, cutting the cards to make study cards should become easier by this adaptation. The social studies teacher suggested using
a key ring to hold all the cards, although with two columns on a sheet, opening a hole on a card will require extra time. One column on a sheet adaptation will also address this point.

4.4.3 Research Procedures

Future investigations should address treatment integrity. For example, the amount of information covered in a class should be carefully monitored so that it will not become too robust. Systematic observations of students’ notetaking behaviors in relation to the rate of teacher presentation may reveal the optimal amount of information or the optimal pace of instruction that can maximize students’ short- and long-term academic success. Teacher’s behaviors, particularly the pace of lecture presentation, and the manner of announcements, should also be monitored. For the review sessions, covert reviewing behaviors could be made overt by, for example, incorporating self-monitoring of the degree of understanding, or by conducting the review using peer-tutoring.

This study addressed the need for research on effective review procedures of lecture notes, but its results should be viewed cautiously. Future research can identify more effective review procedures by comparing a review with and without self-monitoring, or with or without peer-tutoring on the students’ quiz scores. Some positive contingency needs to be added for students’ quiz performances and extra studying at home. Finally, long-term maintenance and generalization of the effects
should be investigated. Maintenance of the learned facts will have significant practical importance when it is investigated in relation to students’ performance on unit tests or end-of-year tests, or even state-wide proficiency test. Generalization can be examined in many ways. For example, generalization of the review procedure may mean that the students using the review procedure at different settings (at home, at cafeteria, etc.), with different people (with parents, with peers, etc.), for different purposes (next-day quizzes, unit tests, end-of-year-tests, etc.). Generalization of the quiz performance may mean that the students would continue scoring higher with guided notes study cards when they were used in different subject classrooms, or with different populations.

4.4.4 Participants

This study targeted students with a wide range of proficiency levels or disability categories. While the results of this study suggest a certain trend, they are not consistent. Replications with a greatly diverse group of students will strengthen the findings of this study. Replications with a less diverse group of students (i.e., students with learning disabilities, students with ADHD, or low-achieving students without disability) may help differentiating the effects of GNSC for different populations. Investigation on the different effects of GNSC on different populations may lead to identification of effective supplemental study techniques for these students.
4.4.5 Research Design

As discussed in the previous sections, this was study was an initial attempt to use guided note study cards. The results of this study are promising, but suggest many areas that await further investigations. Future research should be carried out for longer period of time, so that each phase will have minimum of 5 sessions. The length of each phase should also be varied.

4.5 Summary

The purpose of this study was to evaluate the comparative effects of guided notes (GN) with post-lecture review sessions and guided note study cards (GNSC) with post-lecture structured review sessions on the accuracy of lecture notes and on next-day quiz performance of 7th grade students enrolled in a general education social studies classroom. Three of the fifteen participants had educational special needs; two students were receiving special education services under ADHD category, and a student had hearing impairment. An ABAB reversal design was used in this study, in which the guided notes (GN) with a post lecture review and the guided notes study cards (GNSC) with a post lecture review were alternately presented to the participants. The independent variables were two types of guided notes (GN and GNSC). The front side of the GNSC was formatted similar to the GN, with lecture outlines and blanks for the students to record lecture information. The back side of each GNSC had a question about the word
in the blank pre-printed. The GNSC not only allowed students to record information in
the blanks provided during the lecture, but also became a study material during the
review sessions. Dependent variables were the percent accuracy of students’ lecture
notes and the number of correct responses in the next-day quizzes. The quizzes had ten
recall fill-in-the-blank type questions. Students’, the social studies teacher’s, and student
aides’ opinions about the two types of guided notes were also collected through
interviews.

The results of this study showed that students continued to complete their notes
accurately in both GN and GNSC conditions throughout the study. As for the next-day
quiz scores, ten of the fifteen showed positive effects of the GNSC over GN. Two
students showed no clear trend, and three students’ scores descended in the course of the
study. Twelve of the 13 students who participated in the post-study interview said they
liked the GNSC, and all of them preferred the GNSC over GN as the means of studying
for the quiz. Aides stated that the GNSC provided their student with a good study
strategy. The teacher rated both types of guided notes equally effective, although he
expressed some concern about managing the materials and the students’ study time with
the GNSC.
LIST OF REFERENCES


Yang, F. M. (1988). *Effects of guided notes on sixth graders scores on daily science quizzes*. *Unpublished master's thesis*. The Ohio State University, Columbus, OH.
APPENDIX A

PARENT INFORMATION LETTERS AND CONSENT FORM
March 10, 2004

Dear Parent/Guardian,

My name is Madoka Itoi and I am currently a graduate student in Special Education at The Ohio State University. One of the requirements for completing my course of study is to conduct a research study. I will be conducting my research under the supervision of my faculty advisor, Dr. William Heward, a professor in the College of Education. I am writing to you to explain my research and to ask for your permission to include your child in my study. Missy Gordon, Director of Intervention Services and Karen Petkus, Principle of Jones Middle School, have approved this research study and the inclusion of your child. The 7th grade social studies teacher, Mr. Adam Oliver has agreed to work on this research as the lecturer. I am excited about this collaboration and look forward to working with him. The following is the description of the study I am planning to conduct in the 7th grade world history classroom and an explanation of your rights.

Note-taking skill is one of the crucial skills that would affect a student’s performance in a secondary education setting. This skill will play increasingly significant role as the student proceeds to higher levels of education, for lecture is a widely employed method in typical secondary or post-secondary education classrooms. Guided notes, which provide additional prompts for recording notes, and overhead copies of lecture outlines, are designed to help students to follow the sequence of the lecture. While guided notes are proven to help students perform better on quizzes or tests, especially when combined with review of the notes, the review procedure has not yet been fully studied.

My study will be comparing the effects of guided notes and guided note study cards on three things. (a) completion of student’s notes, (b) accuracy of students notes, and (c) student’s performance on next-day quizzes. Guided note study cards will add a flash-card feature to the guided notes so that students can work on for the review. This research will be conducted during your child’s 9th period social studies class. In the first phase of the study, your child will receive a lecture presented by Mr. Oliver using the guided notes. At the end of the lesson, the students will review their notes independently for 5 minutes. On the following day, your child will take a quiz over facts presented during the previous day’s lecture. In the second phase of the study, your child will again receive a lecture by Mr. Oliver using a guided notes but the five-minute-review will be conducted using the study cards. On the next day, your child will take a quiz covering facts presented during the
previous day's lecture. A comparison will be made between your child's scores on the next-day quizzes when using a review of guided notes and when using a review of the guided note study cards.

While participating in this study, your child will be learning the regular social studies curriculum. In order to prevent any inconvenience between the curriculum requirement and the procedures of the research project, any materials needed during the study will be developed under supervision of Mr. Oliver and Friday classes are solely devoted for regular activities, except for the quiz over Thursday's lecture facts. Also, please be assured that your child's name will not be revealed in any publication, document, recording, computer storage or any other form of report presentation developed from this research.

Attached are two copies of the research study consent form. By signing the consent form you grant permission for your child to participate in this research study. Your child will also be asked to participate in an interview after the study. Please return a signed copy of the consent form and keep the second copy for your own records.

If you have questions regarding this research study and the procedures described above, do not hesitate to call Dr. Heward at 614-292-3348. Or please contact me via email at itoi.1@osu.edu. If you have questions regarding your child's rights as a research participant, you may call the Office of Research Risks Protection at 614-688-4792. Thank you for your cooperation.

Sincerely,

Madoka Itoi
M.A. Student, College of Education, The Ohio State University

William L. Heward
Professor and Faculty Advisor

C: Adam Oliver, Jones Middle School
   Chuck Wood, Doctoral Student/Thesis Mentor
   Corrine Murphy, Doctoral Student/Thesis Mentor

Enclosures: Two copies of Consent Form for Participation in Educational Research
           Two copies of Consent Form for Participation in the final treatment evaluation questionnaire
           Self-addressed stamped envelope
CONSENT FOR PARTICIPATION IN SOCIAL AND BEHAVIORAL RESEARCH

Protocol Title: Effects of Guided Note Study Cards and Structured Review on the Completion and Accuracy of Note-taking and Daily Quiz Performance of Students in a 7th Grade Social Studies Class

Protocol Number: 2004B002

I consent to my child's participation in a research study being conducted by Madoka Itoi and William Heward of The Ohio State University. The study will compare the effects of guided notes and guided note study cards on students' completeness and accuracy of notes and scores on daily quizzes. The investigators have explained the purpose of the study, the procedures that will be followed, and the amount of time it will take. I understand the possible benefits, if any, of my child's participation. I know that I can choose not to allow my child's participation without penalty to me or to my child. If I agree to my child's participation, I can withdraw my consent for my child's participation at any time, and there will be no penalty.

I understand my child's and my own identify will not be revealed to anyone not directly involved in conducting the research, or by means of publication, documentation, computer storage or any other form of report developed from the research. Should I have questions regarding this study, I can call William Heward at (614) 292-3348 or Madoka Itoi via email at itoi.1@osu.edu. If I have questions regarding my child's rights as a research participant, I am able to call the Office of Research Risks Protection at (614) 688-4752.

I have read this form or I have had it read to me. I sign it freely and voluntarily. A copy has been given to me.

Print the name of the participant: ____________________________

Date: ____________________________ Signed: ____________________________

Signed: ____________________________

Madoka Itoi
Co-Principal Investigator

Signed: ____________________________

William L. Heward, Faculty Advisor
Principal Investigator
Workforce Development & Education

Printed by: ____________________________

Behavioral & Social Sciences IRB Application Form, Revised February 29, 2008

College of Education
APPENDIX B

LECTURE NOTES ACCURACY CHECKLIST
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**% Total**

*: If the item is correct (spelled correctly, using correct equivalence e.g., 5 for "five")
- : If the item is incorrect, contains spelling mistakes, or omits part of the word.
N : No response, blank, or a question mark

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**% Total**

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+ : If the item is correct (Spelled correctly, using correct equivalence (e.g., 8 for "five") or phonetically identifiable.
- : If the item written is incorrect, or phonetically unidentifiable.
N : no response; blank or a ? (question mark)

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* : If the item is correct (Spelled correctly, using correct equivalence e.g., 5 for "five")
- : If the item written is incorrect, contains spelling mistakes, or omits part of the word.
N : No response; blank or a ? (question mark)
APPENDIX C

NEXT-DAY QUIZZES

Quiz 1: from the GN phase

Quiz 2: from the GNSC phase

Quiz 3: from the GNSC phase
Suspected missing page 122.
Suspected missing page 123.
Quiz 3

<Quiz> Etruscan Rule Thursday, April 22, 2004

Name ________________________________

1. After the conflict between the upper class and lower class, officials called tribunes were elected to represent people from the lower class. These officials had a right to ____________, which was a right to refuse to approve proposals of government made by the upper class officials.

2. ____________, were the officials of the Roman Republic. There were 300 of them who served this position for the life time, and they appoint government officials and judges.

3. The Patricians, the upper class citizens, were small group of wealthy landowners. They advised the king, served as important officials, and controlled valuable lands. The word Patricians came from a Latin patres which means ____________.

4. The rights of the lower class people were extended over time. For example, 367 BCE change of law decided that one of the two ____________ was to be elected from the lower class people.

5. By 494 BCE, the population of Rome had grown up to ____________ people.

6. Creation of the Roman Republic and democratic government did not allow the lower class people to participate in the political activities. This caused “Conflict of the ____________” in 494 BCE.

7. Peasants, ____________, laborers, or shopkeepers constituted the lower-class citizens.

8. In __________ BCE, the plebeians gained the right to pass laws for all Roman citizens. They also gained new rights. For example, they were able to approve or reject laws, or become a member of the 300 officials.

9. In 509 BCE, a group of patricians rebelled and over threw the Etruscan King and replaced the king with a ____________. In this political system, people elected officials to work for the interests of them.

10. The lower-class citizen gained equal rights to the upper-class citizen, or the Patricians, by means of ____________
APPENDIX D

QUIZ SCORING SHEETS
### Quiz Scoring Sheet (for Tuesday, May 18, 2004)

**Date Scored:__________**

**IOA: (Yes / No) ________**

**Name:__________**

(Content covered on Monday, 5/17/2004)

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**Total #:**

**%:**

**+ :** if the item is correct, if contains more than 60% of the letters, correct (even if spelled incorrectly)

**- :** if the item written is incorrect, or contains less than 60% of the letters included in the answer

**N :** no response; blank or a "?"
![Quiz Scoring Sheet](image)

**Quiz Scoring Sheet** (for Monday, May 24, 2004) Date Scored __________  IOA: (Yes / No) Name __________

(Content covered on 5/20/2004)

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+ : if the item is correct, if contains more than 60% of the letters, correct (even if spelled incorrectly), or phonetically identifiable

- if the item written is incorrect, or contains less than 60% of the letters included in the answer

N : no response; blank or a "?"
Quiz Scoring Sheet (for Thursday April 22) Date IOA: (Yes / No) Name
(Content covered on 4/21/04)

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+: if the item is correct, if contains more than 60% of the letters, correct (even if spelled incorrectly)
-: if the item written is incorrect, or contains less than 60% of the letters included in the answer
N: no response; blank or a "?"
APPENDIX E

LECTURE OUTLINES

Lecture Outline 1: Lecture with GN

Lecture Outline 2: Lecture with GNSC

Lecture Outline 3: Lecture with GNSC
The Aztec People
  • Hardworking farmers-warriors who were the strength of the empire

Average size of the people
  • Women averaged
    — 4 feet 8 inches
  • Men averaged
    — 5 feet 2 to 3 inches

Skin and Hair Color
  • Bronze like Brown for their skin
  • Eyes and Hair was black

Society
  • There were sharp divisions between their social classes
    — Their rules covered many aspects of life

One example of a rule
  • What people of different classes could wear
    — The common people would wear a material that came from the agave plant
    — The higher classes could wear cotton

The maxtli
  • The loincloth that all men wore
    — A long strip of cloth that was wrapped around the waist, passed between the legs and tied in front
    — They also wore a tilmanti, a white cloak

The women
  • They wore an ankle-length skirt
    — Cuetl

For the common people
  • Everyday colors were white

(Page 1 of Lecture Outline 1)
Noble families
- Dressed as the common people did
- But their material was made from cotton and had designs on the clothing
- And the men and women wore jewelry

The king wore a ...
- Turquoise ornament in his nose

Housing
- The common people only had one room
  - Partitioned the sleeping area from the cooking area
  - Walls were built of reeds and mud
  - Roof was made of reeds and grasses

Upper class housing
- Lived in an adobe
  - Made of sun dried clay brick
  - Had many rooms and doors
  - Inner courtyard had flower and vegetable gardens

Children
- At the age of three their education began
  - Parents lectured about the importance of:
    - Duty
    - Hard work
    - Leading a good life

Ages of three to six
- Children did small household chores

If they got into trouble
- Their punishment was harsh
  - They might be pricked with needles
  - Left tied up in a mud puddle all night

At the age of six
- Boys learned farming, fishing, and their father’s trade
- Girls learned their mother’s tasks of:
  - Cooking
  - Weaving
  - Making clothes
  - Childcare

(Page 2 of Lecture Outline 1)
Every child went to school
  • Ages 6 to 9 years old

Boys were taught
  • Citizenship
  • Religion
  • Ritual dances
  • Songs
  • Music
  • History
  • Crafts
  • Use of weapons

Since most of the teachers were soldiers
  Boys learned how to capture prisoners in battle

The Girls School
  • Taught the skills they would use in:
    – Family life
    – Healing arts
    – Religion and ritual music / dance

War
  • Wars were fought for religious reasons
  • And to control land

When the Aztecs conquered new lands
  • They did not stay to rule them
  • The defeated groups were allowed to keep their own leaders but they had to pay tribute to the Aztecs

Their number system
  • They had a written number system
    – A dot or a finger stood for the number 1
    – Dots were used for numbers up to 20
    – A flag meant 20
    – A single feather stood for 400
    – A pouch or bag was 8,000

(Page 3 of Lecture Outline 1)
Writing system

- Hieroglyphs were used for words

- Aztec glyphs were simple pictures
  - Example
    - Bare footprints meant traveling
    - A burned temple pierced by a sword meant victory
Inca Culture
Thursday, May 20th, 2004

Between 1200 and 1535 CE
- The Inca population lived in South America
  - Extending from the Equator
  - To Chile

The Land
- Most of the land is 3,000 meters about sea level
- The Coastal mountain ranges receive no rain fall at all
  - Full of deserts

The start of Inca Rule
- Started with the conquest of the Moche Culture in Peru
- The Inca were warriors with a strong and powerful army

Their fierce army
- The Incas became the largest Native American society
- In 1532, the Inca was at its height and it spanned from southern Colombia to southern Chile

The cities
- Were mainly built on the highlands of the Andes Mountains
- Stone steps lead up to the top of the cities
  - This is where you would find stone houses and religious buildings

Hierarchy
- Sapa was the high priest or ruler
- Family members were councilors to the Sapa
- Even women had authority in the Inca government
- The lowest classes consisted of artisans, farmers, and herders

Irrigation
- Drainage systems helped expand farming into the highland areas.
  - Because of irrigation systems they were able to grow
- Potatoes
- Tomatoes
- Cotton
- Peanuts
- Coca

(Page 1 of Lecture Outline 2)
Transportation
- Incas used llamas for transportation and they would use them for meat.

Protection
- The Incas built enormous fortresses on top of steep mountains that enabled them to see their enemies.

Punishments
- If someone stole, murdered, and committed a sex crime, they were thrown off a cliff.
  - So that the person would smash on the rocks below.

Lesser Crimes
- Were punished by have their hands cut off or eyes cut out, or hung up to starve to death.

Religion
- Their major god was the Sun God (Inti)
- Other Gods represented
  - Moon (Quilla)
  - Earth
  - Thunder/lightning
  - Sea

Clothing
- Clothing was based on positions in a social structure
- Men wore tunics
- Women wore ankle-length skirts

1535 CE
- The Inca empire came to a brutal end when Spanish conquerors battled them for their territory.
  - Ultimately the Incas lost.
  - 40,000 members lost to 180 Spanish soldiers.

(Page 2 of the Lecture Outline 2)
Etruscan Rule
Wednesday, April 21, 2004

Etruscan Rule
• Between 616 BCE and 509 BCE, the Etruscans ruled Rome
• Roman Society was divided into two classes
  – The Patricians
  – The Plebeians

The Patricians
• The Upper Class Citizens
• Came from a small group of wealthy landowners
• In Latin, the word *patres* means “father”

Fathers of the State
• Were the men who advised the Etruscan king
• Patricians controlled the most valuable land
• They also held important offices
  – Military
  – Religious

The Plebeians
• Lower-class citizens
• They were mostly
  – Peasants
  – Laborers
  – Craftspeople
  – Shopkeepers

Who was a Plebeian?
• 95 Percent of the Romans were plebeians
• The word plebeian comes from the word *pleb*, which means “many”
• They could not be:
  – Priests
  – Government officials
• However they were forced to serve in the Army

509 BCE
• A group of patricians rebelled and overthrew the Etruscan King
• They replaced the king with a republic
• In a republic, elected officials work for the interests of the people

(Page 1 of Lecture Outline 3)
Define “PEOPLE”

- The word people doesn’t included the plebeians, only the patricians

The power belongs to the SENATE

- Senate: a group of 300 men elected to govern Rome in the Roman Republic
- Each senator serves for life
- They appoint government officials and judges

Two Elected Officials

- Consuls: chief leaders of the Roman Republic.
- Two men that shared power of the army.
- The senate advised the consuls, and all senate decisions were treated as laws

A true democratic government?

- The creation of the republic gave Rome a more democratic government.
- However, only the patricians could participate in the government

How did the Plebeians Feel?

- The plebeians were upset because they had no political rights, and they had to follow the laws written by the senators.

Conflict

- A struggle between the plebeians and the patricians breaks out.
  - This conflict is called the “Conflict of the Orders”

494 BCE

- Rome’s population has grown and is now anywhere from 25,000 to 40,000 people.
- Remember 95% of the population are plebeians
- Plebeians become angry because of their lack of power

494 BCE Cont.

- The plebeians march out of the city and camp on a nearby hill.
- They refused to come back until the patricians met their demands
- During this time period, work in the city and on farms comes to a stop

Compromise

- Without works and solders, Rome was defenseless and the Patricians felt the pressure, and met the plebeians demands

After the revolt

- The patricians agreed to let the plebeians elected their own officials.
- They were called Tribunes of the Plebs
- **Tribune:** an official of the Roman elected by plebeians to protect their rights

(Page 2 of Lecture Outline 3)
The tribunes
- Spoke for the plebeians to the senate and the consuls.
- In time, they gained the power to veto
- Veto: to refuse to approve proposals of government made by the Senate

Council of Plebs
- Elected lawmaking body
- Made only laws for plebeians, not patricians

Equal?
- Plebeians gained some important rights, but they still had less power than the patricians
- 200 years later, with the use of protest, they gained equal rights

The Twelve Tablets
- 451 BCE patricians agreed to write down all laws on 12 tablets
- This way they couldn’t change the laws to fit their needs

367 BCE
- One of the two consuls was to be a plebeian
- Later a change was made to allow plebeians to become senators

287 BCE
- The plebeians gained the right to pass laws for all Roman citizens
- New roles for the plebeians

They were able to:
- Approve or reject laws
- Nominate the consuls
- Tribunes
- Members of the senate

(Page 3 of Lecture Outline 3)
APPENDIX F

GUIDED NOTES (GN)
A. The Aztec People
   • Hardworking farmers- ____________, who were the strength of the empire

Average size of the people
   • Women averaged
     – 4 feet 8 inches
   • Men averaged
     – 5 feet 2 to 3 inches

Skin and Hair Color
   • Bronze like Brown for their skin
   • Eyes and Hair was ______________

B. Society
   • There were sharp divisions between their social classes
     – Their rules covered many aspects of life

One example of a rule
   • What people of different classes could wear
     – The common people would wear a material that came from the agave plant
     – The higher classes could wear ____________

The ________________
   • The loincloth that all men wore
     – A long strip of cloth that was wrapped around the waist, passed between the legs and tied in front
     – They also wore a tilmanti, a white cloak

The women
   • They wore an ankle-length skirt
     – ________________

For the common people
   • Everyday colors were white
Noble families
  • Dressed as the common people did
  • But their material was made from cotton and had designs on the clothing
  • And the men and women wore jewelry

The king wore a ...
  • ____________ ornament in his nose

C. Housing
  • The common people only had one room
    – Partitioned the sleeping area from the cooking area
    – Walls were built of ____________ and mud
    – Roof was made of reeds and grasses

Upper class housing
  • Lived in an adobe
    – Made of sun dried ____________ brick
    – Had many rooms and doors
    – Inner courtyard had flower and vegetable gardens

D. Children
  • At the age of three their education began
    – ____________ lectured about the importance of:
      • Duty
      • Hard work
      • Leading a good life

Ages of three to six
  • Children did small household chores

If they got into trouble
  • Their punishment was harsh
    – They might be pricked with needles
    – Left tied up in a mud puddle all night

At the age of six
  • Boys learned farming, fishing, and their father’s trade
  • Girls learned their mothers tasks of:
    – Cooking
    – Weaving
    – Making clothes
    – Childcare

(Page 2)
141
Every child went to school
  - Ages 6 to ____________ years old

Boys were taught
  - Citizenship
  - Religion
  - Ritual dances
  - Songs
  - Music
  - History
  - Crafts
  - Use of ____________

Since most of the teachers were soldiers
  - Boys learned how to capture prisoners in battle

The Girls School
  - Taught the skills they would use in:
    - Family life
    - ____________ arts
    - Religion and ritual music / dance

E. War
  - Wars were fought for ____________ reasons
  - And to control land

When the Aztecs conquered new lands
  - They did not stay to rule them
  - The defeated groups were allowed to keep their own leaders but they had to pay tribute to the Aztecs

F. Their number system
  - They had a written number system
    - A dot or a finger stood for the number 1
    - Dots were used for numbers up to 20
    - A flag meant 20
    - A single ____________ stood for 400
    - A pouch or bag was 8,000

(Page 3)
G. Writing system

• ____________ were used for words
• Aztec glyphs were simple pictures
  – Example
    • Bare footprints meant traveling
    • A burned temple pierced by a sword meant victory
APPENDIX G

GUIDED NOTES STUDY CARDS (GNSC)

GNSC-1

GNSC-2
Inca Culture
Thursday, May 20th, 2004

Name ____________________

The Land
- Most of the land is 3,000 meters above sea level.
- The Coastal mountain ranges receive no rain at all
  - Full of deserts

The start of Inca Rule
- Started with the conquest of the Moche Culture in Peru
- The Inca were warriors with a strong and powerful army

Their fierce army
- The Incas became the largest Native American society
- In 1532, the Inca was at its height and it spanned from southern Colombia to southern Chile

The cities
- Were mainly built on the highlands of the Andes Mountains
- Stone steps lead up to the top of the cities
  - This is where you would find stone houses and religious buildings

Hierarchy
- Sapa was the high priest or ruler
- Family members were councilors to the Sapa
- Even women had authority in the Inca government
- The lowest classes consisted of artisans, farmers, and herders

Irrigation
- Drainage systems helped expand farming into the highland areas.

Between 1200 and 1535 CE
- The Inca population lived in South America
  - Extending from the Equator
  - To Chile

(GNSC-1, Page 1, Front)
Question
Between 1200 and 1535 CE, the Inca Empire extended from the equator to ________

3 Question
The start of Inca Rule started with the conquest of the Moche Culture in Peru. The Inca were warriors with a strong and powerful ________

4 Question
The cities were mainly built on the highlands of the ________ Mountains.

5 Question
______ systems helped expand farming into the highland areas.

6 Question
Most of the land is 3,000 meters above ________ level.

7 Question
In ________, the Inca was at its height and it spanned from southern Colombia to southern Chile

8 Question
In the social hierarchy, Sapa was the high ________ or ruler.

(GNSC-1, Page 1, Back)
Because of irrigation systems they were able to grow:

- Potatoes
- Tomatoes
- Cotton
- Peanuts
- Coca

Transportation

- Incas used llama's for transportation and they would use them for meat.

Protection

- The Incas built enormous fortresses on top of steep mountains that enabled them to see their enemies.

Punishments

- If someone stole, murdered, and committed a sex crime, they were thrown off a cliff so that the person would smash on the rocks below.

Lesser Crimes

- Were punished by having their hands cut off or eyes cut out, or hung up to starve to death.

Religion

- Their major god was the Sun God (Inti).
- Other gods represented:
  - Moon (Quilla)
  - Earth
  - Thunder/lightning
  - Sea

Clothing

- Clothing was based on positions in social structure.
- Men wore tunics.
- Women wore ankle-length skirts.

1535 CE

- The Inca Empire came to a brutal end when Spanish conquerors battled them for their territory.
- Ultimately the Incas lost.
- 40,006 members lost to 180 Spanish soldiers.

(GNSC-1, Page 2, Front)
Question
Incas used ________ for transportation
and they would use them for meat.

Question
Because of irrigation systems they were
able to grow:
- Tomatoes
- Cotton
- Peanuts
- Coca

Question
The Incas built enormous
on top of steep mountains that enabled them to
see their enemies

Question
If someone ________, murdered, and
committed a sex crime, they were thrown off a
ciff

Question
Their major god was the ________ God (Inti).

Question
_______ Crimes were punished by having
their hands cut off or eyes cut out, or hung up
to starve to death

Question
In 1535 CE, the Inca Empire came to a brutal
down when Spanish conquerors battled them for
their territory.
40,000 members lost to ________ Spanish
soldiers

Clothing was based on positions in a social
structure. For example, ________ wore
tunics and women wore ankle-length skirts.
Etruscan Rule

Wednesday, April 21, 2004

Name ______________________

#1

Etruscan Rule

• Between 616 BCE and 509 BCE, the Etruscans ruled Rome
• Roman Society was divided into two classes
  - The Patricians
  - The ____________

#2

The Patricians

• The Upper Class Citizens
• Came from a small group of wealthy landowners
• In Latin, the word patres means "__________"

Fathers of the State

• Were the men who advised the Etruscan king
• Patricians controlled the most valuable land
• They also held important offices
  - Military
  - Religious

#3

The Plebeians

• Lower-class citizens
• They were mostly
  - Peasants
  - Laborers
  - ____________
  - Shopkeepers

#4

Who was a Plebeian?

• _______ Percent of the Romans were plebeians
• The word plebeian comes from the word pleb, which means "many"
• They could not be:
  - Priests
  - Government officials
• However they were forced to serve in the Army

#5

509 BCE

• A group of patricians rebelled and over threw the Etruscan King
• They replaced the king with a
  - ____________
• In a republic, elected officials to work for the interests of the people

Define "PEOPLE"

• The word people doesn't included the plebeians, only the patricians

(GNSC-2, Page 1, Front)

149
Question:
Fill in the appropriate word in the blank below.
Between 816 BCE and 509 BCE, the Etruscans ruled Rome. During this time, the Roman society had two classes called the Patricians and the ____________.

Question:
What did most of the lower-class citizens do? They were laborers, peasants, ____________, or shopkeepers.

Question:
In 509 BCE, the Etruscan King was replaced with a _____________.

Question:
Percent of the Romans were plebeians. The word plebe means "many".
The power belongs to the
  • Senate: a group of 300 men elected to govern Rome in the Roman Republic.
  • Each senator serves for life.
  • They appoint government officials and judges.

Two Elected Officials
  • ______: chief leaders of the Roman Republic.
  • Two men that shared power of the army.
  • The Senate advised the consuls, and all Senate decisions were treated as laws.

Why a conflict?
494 BCE
  • Rome's population has grown and is now anywhere from 25,000 to ______ people.
  • Remember 95% of the population are plebeians.
  • Plebeians become angry because of their lack of power.
  • The plebeians march out of the city and camp on a nearby hill.
  • They refused to come back until the patricians met their demands.
  • During this time period, work in the city and on farms comes to a stop.

After the revolt
  • The patricians agreed to let the plebeians elect their own officials.
  • They were called Tribunes of the Plebs.

Tribune: an official of the Roman elected by plebeians to protect their rights.

The tribunes
  • Spoke for the plebeians to the Senate and the consuls.
  • In time, they gained the power to veto ______: to refuse or to approve proposals of government made by the Senate.

A true democratic government?
  • The creation of the republic gave Rome a more democratic government.
  • However, only the patricians could participate in the government.

How did the Plebeians Feel?
  • The plebeians were upset because they had no political rights, and they had to follow the laws written by the senators.

Conflict
  • A struggle between the plebeians and the patricians breaks out.
  • This conflict is called the "Conflict of the _________."

Without workers and soldiers, Rome was defenseless and the Patricians felt the pressure, and met the plebeians demands.
Question:
How were the two chief leaders of the Roman Republic called? They shared power of the army.

Question:
In the Roman Republic, a group of 300 men called the ________ ruled the political activities.

Question:
In 494 BCE, how many populations did the city of Rome have?
- From 25,000 to ________

Question:
The conflict between the Patricians and the Plebeians in 494 BCE is called the "Conflict of the _________."

Question:
After the conflict, new officials called the Tribunes were elected by plebeians to protect their rights. These officials gained rights to refuse or to approve proposals of government. How did the Romans call this?

Question:
In the 494 BCE conflict, the Patricians had to make a ________ because Rome was left defenseless due to the absence of soldiers or warriors.
Council of Plebs
• Elected lawmaking body
• Made only laws for plebeians, not patricians

Equal?
• Plebeians gained some important rights, but they still had less power than the patricians
• 200 years later, with the use of ______, they gained equal rights

The Twelve Tablets
• 451 BCE patricians agreed to write down all laws on 12 ______
• This way they couldn't change the laws to fit their needs

367 BCE
• One of the two _______ was to be a plebeian
• Later a change was made to allow plebeians to become senators

______ BCE
• The plebeians gained the right to pass laws for all Roman citizens
• New roles for the plebeians
  - They were able to:
    • Approve or reject laws
    • Nominate the consuls
    • Tribunes
    • Members of the senate

(GNSC-2, Page 3, Front)
153
Question:
By writing down all laws on 12 ________ in 451 BCE, patricians could no longer change the laws to fit their laws.

Question:
Plebeians gained equal rights with the use of ________.

Question:
In what year did the plebeians gain the right to pass laws for all Roman citizens?

Question:
In 367 BCE, a change was made to let one of the two ________ to be elected from a plebeian.
APPENDIX H

LECTURE SLIDES

Lecture Slides 1: GN lecture

Lecture Slides 2: GNSC lecture

Lecture Slides 3: GNSC lecture
Aztec Culture
Monday, May 17th, 2004

The Aztec People
Hardworking farmers-warriors who were the strength of the empire

Average size of the people
Women averaged
- 4 feet 8 inches

Men averaged
- 5 feet 2 to 3 inches

Skin and Hair Color
Bronze like Brown for their skin
Eyes and Hair was black

Society
There were sharp divisions between their social classes
- Their rules covered many aspects of life

One example of a rule
What people of different classes could wear
- The common people would wear a material that came from the agave plant
- The higher classes could wear cotton

(Page 1 of Lecture Slides 1)
The men
The loincloth that all men wore
- A long strip of cloth that was wrapped around the waist, passed between the legs and tied in front
They also wore a tilmantl, a white cloak

The women
They wore an ankle-length skirt
- Cuetl

For the common people
- Everyday colors were white

Noble families
Dressed as the common people did
- But their material was made from cotton and had designs on the clothing
- And the men and women wore jewelry

The king wore a ...
- Turquoise ornament in his nose

Housing
The common people only had one room
- Partitioned the sleeping area from the cooking area
- Walls were built of reeds and mud
- Roof was made of reeds and grasses

(Page 2 of Lecture Slides 1)
Upper class housing
Lived in an adobe
- Made of sun dried clay brick
- Had many rooms and doors
- Inner court yard had flower and vegetable gardens

Children
At the age of three their education began
- Parents lectured about the importance of:
  - Duty
  - Hard work
  - Leading a good life

Ages of three to six
Children did small household chores

If they got into trouble
Their punishment was harsh
- They might be pricked with needles
- Left tied up in a mud puddle all night

At the age of six
Boys learned farming, fishing, and their father's trade
Girls learned their mother's tasks of:
- Cooking
- Weaving
- Making clothes
- Childcare

Every child went to school
- Ages 6 to 9 years old

(Page 3 of Lecture Slides 1)
Boys were taught:
- Citizenship
- Religion
- Ritual dances
- Songs
- Music
- History
- Crafts
- Use of weapons

Since most of the teachers were soldiers:
Boys learned how to capture prisoners in battle

The Girls School:
Taught the skills they would use in:
- Family life
- Healing arts
- Religion and ritual music/dance

War:
Wars were fought for religious reasons
And to control land

When the Aztecs conquered new lands:
They did not stay to rule them.
The defeated groups were allowed to keep their own leaders but they had to pay tribute to the Aztecs

Their number system:
They had a written number system:
- A dot or a finger stood for the number 1
- Dots were used for numbers up to 20
- A bar meant 20
- A single feather stood for 400
- A pouch or bag was 8,000

(Page 4 of Lecture Slides 1)
Writing system
Hieroglyphs were used for words
Aztec glyphs were simple pictures

- Example
  - Bare footprints meant traveling
  - A burned temple pierced by a sword meant victory
Inca Culture
Thursday, May 20th, 2004

Between 1200 and 1535 CE
- The Inca population lived in South America
- Extending from the Equator
- To Chile

The Land
- Most of the land is 3,000 meters above sea level
- The Coastal mountain ranges receive no rain fall at all
- Full of deserts

The start of Inca Rule
- Started with the conquest of the Moche Culture in Peru
- The Incas were warriors with a strong and powerful army

Their fierce army
- The Incas became the largest Native American society
- In 1532, the Inca was at its height and it spanned from southern Colombia to southern Chile

The cities
- Were mainly built on the highlands of the Andes Mountains
- Stone steps lead up to the top of the cities
- This is where you would find stone houses and religious buildings

(Page 1 of Lecture Slides 2)
Hierarchy
- Sapa was the high priest or ruler
- Family members were counselors to the Sapa
- Even women had authority in the Inca government
- The lowest classes consisted of artisans, farmers, and herders

Irrigation
- Drainage systems helped expand farming into the highland areas.
- Because of irrigation systems they were able to grow
  - Potatoes
  - Tomatoes
  - Cotton
  - Peanuts
  - Coca

Transportation
- Incas used llamas for transportation and they would use them for meat.

Protection
- The Incas built enormous fortresses on top of steep mountains that enabled them to see their enemies

Punishments
- If someone stole, murdered, and committed a sex crime, they were thrown off a cliff
- So that the person would smash on the rocks below

Lesser Crimes
- Were punished by having their hands cut off or eyes cut out, or hung up to starve to death

(Page 2 of Lecture Slides 2)
**Religion**
- Their major god was the Sun God (Inti)
- Other Gods represented
  - Moon (Quilla)
  - Earth
  - Thunder/lightning
  - Sea

**Clothing**
- Clothing was based on positions in a social structure
- Men wore tunics
- Women wore ankle-length skirts

**1535 CE**
- The Inca empire came to a brutal end when Spanish conquerors battled them for their territory.
- Ultimately the Incas lost.
- 40,000 members lost to 180 Spanish soldiers

(Page 3 of Lecture Slides 2)
Etruscan Rule

- Between 616 BCE and 509 BCE, the Etruscans ruled Rome
- Roman Society was divided into two classes
  - The Patricians
  - The Plebeians

The Patricians

- The Upper Class Citizens
- Came from a small group of wealthy landowners
- In Latin, the word patres means "father"

Fathers of the State

- Were the men who advised the Etruscan king
- Patricians controlled the most valuable land
- They also held important offices
  - Military
  - Religious

The Plebeians

- Lower-class citizens
- They were mostly
  - Peasants
  - Laborers
  - Craftspeople
  - Shopkeepers

Who was a Plebeian?

- 95 Percent of the Romans were plebeians
- The word plebeian comes from the word plebs, which means "many"
- They could not be:
  - Priests
  - Government officials
- However, they were forced to serve in the Army

(Page 1 of Lecture Slides 3)
509 BCE
- A group of patricians rebelled and overthrew the Etruscan King
- They replaced the king with a republic
- In a republic, elected officials work for the interests of the people

Define "PEOPLE"
- The word人民 doesn't include the plebeians, only the patricians

The power belongs to the SENATE
- Senate: a group of 300 men elected to govern Rome in the Roman Republic
- Each senator serves for life
- They appoint government officials and judges

Two Elected Officials
- Consul: chief leaders of the Roman Republic.
- Two men that shared power of the army.
- The senate advised the consul, and all senate decisions were treated as laws

A true democratic government?
- The creation of the republic gave Rome a more democratic government.
- However, only the patricians could participate in the government

How did the Plebeians Feel?
- The plebeians were upset because they had no political rights, and they had to follow the laws written by the senators.
Conflict
- A struggle between the plebeians and the patricians breaks out.
  - This conflict is called the "Conflict of the Orders" 

494 BCE
- Rome's population has grown and is now anywhere from 20,000 to 40,000 people.
- Remember 95% of the population are plebeians
- Plebeians become angry because of their lack of power

494 BCE Cont.
- The plebeians march out of the city and camp on a nearby hill.
- They refused to come back until the patricians met their demands.
- During this time period, work in the city and on farms comes to a stop

Compromise
- Without workers and soldiers, Rome was defenseless and the Patricians felt the pressure, and met the plebeians demands

After the revolt
- The patricians agreed to let the plebeians elected their own officials.
- They were called Tribunes of the Plebs
- Tribune: an official of the Roman elected by plebeians to protect their rights

The tribunes
- Spoke for the plebeians to the senate and the consuls.
- In time, they gained the power to veto
- Veto: to refuse to approve proposals of government made by the Senate

(Page 3 of Lecture Slides 3)
Council of Plebs
- Elected lawmaking body
- Made only laws for plebeians, not patricians

Equal?
- Plebeians gained some important rights, but they still had less power than the patricians
- 200 years later, with the use of protest, they gained equal rights

The Twelve Tables
- 451 BCE patricians agreed to write down all laws on 12 tablets
- This way they couldn't change the laws to fit their needs

367 BCE
- One of the two consuls was to be a plebeian
- Later a change was made to allow plebeians to become senators

287 BCE
- The plebeians gained the right to pass laws for all Roman citizens
- New roles for the plebeians:
  - They were able to:
    - Approve or reject laws
    - Nominate the consul
    - Tribunes
    - Members of the senate

(Page 4 of Lecture Slides 3)
APPENDIX I

STUDY "PLACEMAT"
1. Shuffle the cards
2. Read the question on the back of the card
3. Think of the answer
4. Flip the card and check the answer
5. Place the card on the “CORRECT” if your answer is correct, place the card on “INCORRECT” if not.
6. When finished, review all incorrect cards
7. Go back to step one.

<table>
<thead>
<tr>
<th>Correct</th>
<th>Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Correct Face" /></td>
<td><img src="image2" alt="Incorrect Face" /></td>
</tr>
</tbody>
</table>
APPENDIX J

INTERVIEW QUESTIONS
Social Validity Questions
Teacher/Aides

1. What differences between two GNs procedures, if any, did you see in the students’ behavior during the lectures? Please tell me any specific examples?

2. What differences between two GNs procedures, if any, did you notice in the students’ behaviors during the study time? Please tell me any specific examples?

3. Did you ever notice the students’ studying their GNs outside of the 9th period social studies class? If so, did you notice the students studying one form of the GNs more than the other? Can you give me any examples?

4. Did any of the students ever make comments about either of the GN procedures to you or that you overheard? If so, please me what the students said.

5. Do you think either GNs procedure facilitated the students’ learning? Why or why not?

6. Was one GNs procedure more or less helpful to students’ learning than the other? Why or why not?

7. How do you think students used the guided note study cards?

SHOW GRAPHS

8. Now that you’ve seen your students’ quiz scores, do you think either of the two GNs procedures improved students’ learning?

<The following items are only for the teacher.>

9. Do you think your students with IEPs benefited from either of the GNs procedures? What reasons or examples do you give for your answer?

10. Do you think you will use either of the GNs procedures in any of your classes next year? Why or why not?

11. What changes, if any, would you make in the GNs materials or procedures?
12. Is there anything else you observed or want to tell about either of the GNs procedures?

Students

Show student two types of GNs and remind him or her of the basic procedures.

1. Did you like or prefer one way of doing GNs better than the other? Why or why not?

2. Which type of GNs did you find easier to use during lecture? Please tell me why.

3. Tell me how you used the regular GNs to study for the quizzes. Where did you study the GN? How often? How much time did you usually spend studying your GNs?

4. Tell me how you used the GNSCs to study for the quizzes. Where did you use the GNSC? How often? How much time did you usually spend studying your GNSCs?

5. Was one type of GNs easier than the other type when studying and reviewing for the quizzes? If so, which one and why?

6. Do you think one type of GNs helped you do better on the quizzes than the other? If so, which one and why?

7. Which of these statements best described how you feel about using and reviewing the guided notes?

   A. I really liked the GNs.
   B. I liked the GNs.
   C. I don't care one way or the other.
   D. I didn't like the GNs
   E. I really didn't like the GNs.

8. Which of these statements best described how you feel about using and reviewing the guided notes?

   A. I really liked the GNSCs.
   B. I liked the GNSCs.
C. I don't care one way or the other.
D. I didn't like the GNSCs
E. I really didn't like the GNSCs.

9. Is there anything else you observed or want to tell about either of the GNs procedures?
APPENDIX K

“ANSWER CHOICE” FOR THE STUDENT INTERVIEW
A. I really liked it,

B. I liked it,

C. I don’t care one way or the other,

D. I didn’t like it,

E. I really didn’t like it.