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LEARNING STRATEGIES, COGNITIVE STRATEGIES, AND PROCESS VARIABLES USED BY HIGH SCHOOL STUDENTS IN SOCIAL STUDIES CLASSES

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LEISA ANN MARTIN

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LEARNING STRATEGIES, COGNITIVE STRATEGIES, AND PROCESS VARIABLES USED BY HIGH SCHOOL STUDENTS IN SOCIAL STUDIES CLASSES

A Dissertation APPROVED FOR THE
DEPARTMENT OF INSTRUCTIONAL LEADERSHIP AND ACADEMIC CURRICULUM

BY

Dr. John Chiodo, Chair

Dr. Frank McQuarrie

Dr. Gregg Garn

Dr. Jon Pedersen

Dr. Courtney Vaughn

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Abstract

This grounded theory study sought to understand how tenth grade public school students in average and advanced classes used strategies for learning material in their high school social studies classes. This study sought to understand the strategies that students used to learn information, the frequency of their strategy use, the students' method of acquiring these strategies, and the impact of the teachers' method of instruction (direct or indirect) on the students' strategy use. This study suggests that teachers need to stress the relevance of higher-level thinking to students and require more high-level thinking on class work and on exams.

LEARNING STRATEGIES, COGNITIVE STRATEGIES, AND PROCESS VARIABLES USED BY HIGH SCHOOL STUDENTS IN SOCIAL STUDIES CLASSES

Chapter 1

Introduction

In his 1995 book, *Will we be smart enough?,* Edward Hunt analyzed trends in both society and demands for the future workplace. Hunt concluded that the American workforce needs more people skilled in both high level problem solving and the ability to learn how to learn (Hunt, p. 152). He went on to say that the ability to learn new information is important because it can help people to survive within their environment and adapt to it (Hunt, p. 248; Hunt, p. 285). For instance, it used to be common practice for managers, professionals, and college students to have typists or a typing service type their papers. Now, many managers, professionals, and college students type their own documents through word processing programs on computers (Hunt, p. 213; Hunt, p. 268).

Learning can occur in many places, and one such place is school. With some exceptions, students in the United States are legally required to attend school (Rippa, 1997, p. 139), and students are expected to learn facts, ideas, and concepts during their studies (Garrett, 2000). However, not all students know how to learn (McKeachie, 1988, p. 5; Weiten, 1998, p. 29), and not all students are taught how to learn (McKeachie, p. 5; Weiten, p. 29). As a result, some students approach learning using poor learning strategies (Blackerby, 1996, p. 9; Nisbet & Schucksmith, 1986, p.8; Weiten, p. 29).

For the purposes of this study, learning strategies will be defined as "behaviors of a learner that are intended to influence how the learner processes information" (Mayer,

1988, p.11). Examples of poor learning strategies include "guessing impulsively in the face of difficulty in the hope that things will become clear later, skipping the difficult parts, [and] memorizing details instead of looking for principles" (Nisbet & Schucksmith, 1986, p. 8). Examples of desirable learning strategies include "underlining of key ideas in a passage, outlining of the ideas in a lecture, or trying to put some newly learned information into one's own words" (Mayer, p. 11).

Related to the term "learning strategies" is the term "cognitive strategy". While learning strategies focus on how students learn or encode information (Weinstein & Mayer, 1986, p. 315), cognitive strategies focus on how students learn, retain, and retrieve information (Rigney, 1978, p. 165). Cognitive strategies are defined as the procedures and operations that students might use to acquire, retain and retrieve different kinds of knowledge and performance (Rigney, p. 165). An example of cognitive strategies might include using organizational techniques such as having the student create outlines of a chapter from a book to understand the structure of the chapter and promote learning (Pintrich & DeGoot, 1990, p.35). Other examples of cognitive strategies include rehearsing words over and over from the chapter to retain them or using elaboration to summarize important ideas about the lesson in the students' own words to test their retention. Learning strategies and cognitive strategies are valuable because they provide students with a variety of tools for mastering ideas and information.

While learning strategies focus on how students learn and cognitive strategies focus on how students learn and retrieve information, process variables (Anderson & Armbruster, 1984, p. 657) focus on using strategy to maximize the learning and retrieval of information. Process variables are defined as "those involved with getting the

information from the written page into the student's head. The process variables include the initial focusing of attention, the subsequent encoding of the information attended to, and the retrieval of the information as required by the criterion task" (Anderson & Armbruster, p. 657). Students do this by focusing their attention and engaging "in encoding activities in a way that will increase the probability of understanding and retrieving the high pay-off ideas and relationships" (Anderson & Armbruster, p. 660). Transferring the knowledge to the memory using appropriate processing (Anderson & Armbruster, p. 660) can be done by looking at the "goals and purposes of the learner" and using this information to decide if deep processing (learning that focuses on meaning the relation of information to previous knowledge) (Craik & Lockhart, 1972, p. 675) or shallow processing (learning via rote repetition) (Carlson & Buskist, 1997, p.244) is better suited for the purposes of helping the learner reach their goals (Anderson & Armbruster, p. 664). For example, Marton and Sälsjö (1976) study found that students learned the material differently using shallow or deep level processing based on the anticipated task (shallow or deep level questions).

Why should parents, teachers, and students care about learning strategies / cognitive strategies / process variables? Studies also showed that "A" students use strategies to learn that are different from "C" or "D" students (McKeachie, 1988, p. 3; Weinstein & Mayer, 1986). The difference between students who earn high and low grades can be seen in a study by Meyer, Brandt, and Bluth (1990). This study found that "good readers (as measured by a standard reading assessment test) recalled the top-level structure of the passage better than poor readers" (Meyer, Brandt, & Bluth, p.322). In contrast, Weinstein, Zimmerman, and Palmer (1988) found that academically under

prepared undergraduate university students were "extremely deficient in information-processing strategies" (p. 36). A potential consequence of being deficient in learning strategies is that students can end up having fewer tools for learning and understanding information in class.

For students who lack knowledge about learning strategies (Nisbet & Schucksmith, 1986, p.8), cognitive strategies (Wolters & Pintrich, 2001) and process variables, it is important for students to realize that there are various sources for this information. Some potential resources include parents (McKeachie, 1988, p. 5), teachers (McKeachie, 1988, p. 5), and the students themselves. For instance, some parents and teachers do teach their students to learn how to learn. Other parents might want to help their child/children make better grades, may not know how to help them (McKeachie, p. 5). In terms of teachers, some teachers assume that their students already know how to learn (Usova, 1989, p. iii). Other teachers "do not think [that] teaching involves the development of more effective repertoires of learning strategies" (McKeachie, p. 5). In terms of students, some students are able to figure out how to learn on their own. However, other students might not be aware that there are alternative strategies for approaching different learning situations (McKeachie; Paris & Oka, 1986), or they may not understand the value of using cognitive strategies (Paris & Oka). By chance, students may discover effective strategies on their own by varying their approach to learning and finding that one method works better than their other approaches to learning class material (McKeachie, p. 5). However, this trial and error approach leaves each student to "reinvent the wheel" on learning and cognitive strategies.

Research has sought to understand students' usage of learning and cognitive strategies (Ablarrd & Lipschultz, 1998; Biggs, 1984; Wolters & Pintrich, 2001; Zimmerman & Martinez-Pons, 1990). In 1984, Biggs suggested that there are three basic strategies for studying material in schools, and he called these strategies reproducing, meaning, and organizing. Biggs went on to suggest that high achieving students might be using strategies not captured by his study. Later, Zimmerman and Pons (1986) studied self-regulated learning, defined as students who use active participation in the their own learning process in terms of their metacognition, motivation, and behavior. Zimmerman and Pons (1986) conducted a literature review to locate behaviors used by students to learn class material. The authors then correlated these behaviors with student grades. The investigators used this information on student behaviors to create a list of behaviors for the Self-Regulated Learning Interview Schedule (SRLIS). When Ablard and Lipschultz used the SRLIS in their study, they found that some students used strategies from the SRLIS, some students used strategies not listed on the SRLIS, and some students did not use self-regulated learning strategies at all.

Both of these studies (Ablarrd & Lipschultz, 1998; Biggs, 1984) are important in that they help to explain the strategies used by students to learn in the classroom. In addition, they suggest that students may be using additional strategies while they learn. However, Ablard and Lipschultz and Biggs were not based in social studies classrooms. Looking specifically at social studies classrooms could provide additional insight into learning strategy usage by students.

Related to the types of strategies used by student is the frequency with which these strategies are used. For example, Zimmerman (1986) interviewed high school

students to find out how consistently they used learning strategies. By understanding how often students use these strategies (often, sometimes, or rarely) could provide insight into the overall process that students use when they learn information in their social studies classes.

Also related to the strategy use is the issue of strategy source. The strategy source is the source that teaches the student about learning strategies / cognitive strategies / process variables. Research shows that some students seem to have a good grasp of learning/cognitive strategies while other students have a limited grasp of methods of learning/cognitive strategies (McKeachie, 1988, p. 5; Weinstein & Mayer, 1986). The Self-Regulated Learning Interview Schedule (SRLIS) test instrument developed by Zimmerman and Pons (1986) did ask students if they seek assistance from peer, teacher, or adult in various situations when the student faces challenges in learning class material. However, the measure did not focus on social studies students.

Another factor related to the way that students learn is teaching style. Looking at a continuum, teaching styles can be divided into direct instruction and indirect instruction. Direct instruction is defined as "a pattern of teaching that consists of the teacher's explaining a new concept or skill to a large group of students, having them test their understanding by practicing under teacher direction (this is, controlled practice), and encouraging them to continue to practice under teacher guidance (guided practice)" (Joyce & Weil, 2000, p.339).

In contrast to direct instruction, teachers of indirect instruction tend to use a more interactive approach. Indirect instruction is defined as an instructional model that emphasizes "inquiry, problem solving, and discovery learning" (Borich, 1994, p. 284).

An example of indirect instruction can be found in the work of Sewell, Fuller, Murphy, and Funnell (2002). The researchers used creative problem solving, an indirect instructional approach that encouraged citizenship and decision making by having students in the social studies classroom find a problem related to the school (ex. littering) and create a solution to the problem in a systematic manner. Students in the study "were unwilling to accept errors or untidy work, unlike their usual schoolwork efforts" because they saw their project as related to the real world and saw their project as an opportunity to leave a legacy at their school (Sewell, et al., p. 178).

Sewell et al. (2002) showed that elementary and middle school students could be more conscientious or less conscientious about their schoolwork depending upon the nature of the assignment. Because indirect instruction can play a role in the students' approach toward learning, this study will examine if direct or indirect instruction could impact the strategies that high school students use to learn material in their social studies classes.

Purpose of the Study

This study sought to uncover the learning strategies, cognitive strategies, and process variables used by students to learn in the context of a 10th grade social studies classes. In order to learn more about the strategies used by the students in rich detail, this study sought to obtain information via interviews with students using the grounded theory approach. Grounded theory is defined as a qualitative methodology that seeks to "generate or discover a theory, an abstract analytical schema of a phenomenon, that relates to a particular situation" (Creswell, 1998, p. 56) "using distinct features, such as theoretical sampling, and certain methodological guidelines, such as the making of

constant comparisons and the use of a coding paradigm, to ensure conceptual development and density (Strauss, 1987, p. 5). Interviews included 40 public school students and 2 teachers accompanied by classroom observations. Based on the information from the interviews, I used the grounded theory approach to form a model on the ways that students learn.

Research Question

The following question provided the basis for this study. What learning strategies, cognitive strategies, and process variables do students use to learn information in social studies classes? Specifically, the study sought to find out the following three related questions. How often do students use these strategies? How do students acquire these strategies? Does the teacher's methods of instruction have an impact on the students' use of learning strategies, cognitive strategies, and process variables?

Significance of the Study

A better understanding of how students learn in a social studies classroom could benefit educators and as a byproduct, students. This study had two benefits by providing a snapshot of current learning, and exploring the students' sources of learning strategies. First, researchers (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956; Martorella, 2001, p. 200; Gardner & Hatch, 1989, p. 6; Harvey, Hunt, & Schroeder, 1961) have developed theories on how students learn, but do the students use these strategies as part of learning in the social studies classroom? The study provided information in rich detail discussing the participants' use or lack of use of cognitive/learning strategies in school. This insight could give teachers and researchers a snapshot about the ways that the current sample of students learns in their social studies classes.

Second, by understanding the main source or sources of the students' learning strategies, educators have better insight on the students' sources of learning strategies. Limited research has focused on the students' sources of learning strategies. However, this study sought to provide data to better understand the sources that the students turn to when they need to learn class material.

Limitations of the Study

Potential limitations are an inherent part of every research project. This section discusses three potential limitations within the study as well as strategies for potentially counteracting these limitations. Potential limitations include sample size, interview format, and the participants' experiences with the educational system.

There are both benefits and drawbacks associated with sample size. A benefit of using a qualitative approach is the rich detail that can come from interviews. Because the study focused more on live interviews, I concentrated on a small number of participants (40 students and 2 teachers). A drawback of conducting interviews is that the small sample size limits the representativeness of the sample. Using students from only one school in one community in a southwestern state limits the ability of the investigator to generalize the results on a national scale. I attempted to counteract the effect of having a small sample size by attempting to obtain rich detail during the interviews with participants.

Like sample size, there are both benefits and drawbacks to using an interview format. Having interviews with open-ended questions encourages students and teachers to describe their own learning experiences in their own words. However, the value of using interviews or questionnaires is counterbalanced by a potential tendency on the part

of participants to lie or to give socially desirable answers. This tendency has been shown to be a major problem in self-report measures on learning strategies (Weinstein, Zimmerman, and Palmer, 1988, p.30). For instance, Riding (2001) states that the act of "using introspective self-report measures have inherent weaknesses. These include the subject's possible inability to accurately and objectively report his or her behavior, unwillingness to make the necessary effort to respond accurately, and bias due to the pressure of social desirability in making responses" (p. 49).

For this dissertation, individuals could have given socially desirable answers because they did not want the researcher to make negative personal judgments about them. I could not be absolutely sure of the accuracy and objectivity of the participants' comments. I tried to deal with this potential limitation conducting classroom observations and by establishing a nonjudgmental atmosphere during the interviews. Classroom observations provided information that supported the validity and potential appropriateness of the participants' comments. Establishing a nonjudgmental atmosphere was designed to encourage students to be honest during the interviews. When necessary, I reminded the participants the participants' honesty was critical to the success of the study, and I asked students to respond honestly to the questions regardless of whether their methods of learning are socially appropriate or not. Also, I reminded participants that their responses would be kept confidential, that their individual responses would not be shown to their teacher, and would have no impact on their class grade.

An additional factor that could affect the students' and teachers' responses involved the participants' previous and current experiences with the educational system. Research shows that gender (Woolfolk, 1998, p. 183), personality types (Joyce & Weil,

2000, p. 302), race (Good & Brophy, 1995, p.388) and motivation (Biggs, 1984) can influence student attitudes about education. Personality and cultural differences can also have an impact on the professional relationship between the teachers and the students. The teachers in this study could have been positively or negatively biased towards certain students, or the students in this study could have been positively or negatively biased towards their teacher. This relationship could have influenced the comments by teachers and students during the interviews. Likewise, the participants' positive or negative experiences with previous teachers could have biased the participants' responses. I addressed this potential limitation by being conscious of these concerns and attempted to be as unbiased as possible about gender, personality, racial, and motivational differences.

Definitions of Terms

Advanced social studies classes: social studies classes with content designed for above average students.

Average (regular) social studies classes: social studies classes with content designed to meet the state standards. There are generally no academic restrictions for students to take these classes.

Axial coding: begins when the investigator identifies "causal conditions that influence the central phenomenon" (Creswell, 1998, p. 151).

Category: "a unit of information composed of events, happenings, and instances" (Creswell, 1998, p. 56).

Classifying: an aspect of data analysis used in grounded theory in which the investigator engages in axial coding and open coding (Creswell, 1998, p. 148).

Coding paradigm: "a theoretical model that visually portrays the interrelationship of these axial coding categories of information" (Creswell, 1998, p. 151).

Cognitive strategies: "the operations and procedures that a student may use to acquire, retain, and retrieve different kinds of knowledge and performance" (Rigney, 1978, p. 165).

Conditional paradigm: "a diagram that helps the researcher visualize the wide range of conditions and consequences related to the central phenomenon" (Creswell, 1998, p. 151).

Constant comparative method of data analysis: "the process of taking information from data collection and comparing it to emerging categories" (Creswell, 1998, p. 57).

Data managing: an aspect of data analysis used in grounded theory in which the researcher creates and organizes files for the data (Creswell, 1998, p. 148).

Deep processing: focuses on considering the meaning of the stimulus and potentially using "enrichment or elaboration… to trigger associations, images, stories…sounds, sights, smells, and so on" in relation to the stimulus (Craik & Lockhart, 1972, p. 675).

Dimensionalized properties: the presentation of properties in the form of a continuum (Creswell, 1998, p. 151).

Direct instruction: "a pattern of teaching that consists of the teacher's explaining a new concept or skill to a large group of students, having them test their understanding by practicing under teacher direction (this is, controlled practice), and encouraging them to continue to practice under teacher guidance (guided practice)" (Joyce & Weil, 2000, p.339).

Grounded theory: a qualitative methodology that seeks to "generate or discover a theory, an abstract analytical schema of a phenomenon, that relates to a particular situation" (Creswell, 1998, p. 56) "using distinct features, such as theoretical sampling, and certain methodological guidelines, such as the making of constant comparisons and the use of a coding paradigm, to ensure conceptual development and density (Strauss, 1987, p. 5).

Indirect instruction (interactive): an instructional model that emphasizes "inquiry, problem solving, and discovery learning" (Borich, 1994, p. 284).

Interpreting: the act of creating a coding paradigm and an optional conditional matrix (Creswell, 1998, p. 151).

Learning strategies: Learning strategies are defined as "behaviors of a learner that are intended to influence how the learner processes information" (Mayer, 1988, p.11).

Learning strategy training: strategies "aimed at influencing how successfully the learner processes the instructional material" (Mayer, 1988, p. 12).

Metacognition: "awareness of one's mental processes" so as to be "*aware of what one is doing,* or being able to bring one's mental processes under conscious scrutiny and thus more effectively under control" (Nisbet & Shucksmith, 1986, p. 7). "To think and reflect on how one will react or has reacted to a problem or task" (Nisbet & Shucksmith, 1986, p. 30).

Process variables: "those involved with getting the information from the written page into the student's head. The process variables include the initial focusing of attention, the subsequent encoding of the information attended to, and the retrieval of the information as required by the criterion task." (Anderson & Armbruster, 1984, p. 657).

Properties: subcategories that "represent multiple perspectives about the categories" (Creswell, 1998, p. 151).

Qualitative: "any type of research that produces findings not arrived at by statistical procedures or other means of quantification" (Strauss & Corbin, 1998, p.10-11).

Quantitative: "an adjective indicating that something is expressible in terms of quantity, that is, definite amount or number. Thus it is accurate to talk of quantitative measures and quantitative data. The term is often used, however, as a synonym for any design (e.g., experimental, survey) or procedure (e.g., statistical) that relies principally on the use of quantitative data and then contrasted with 'qualitative' accordingly" (Schwandt, 1997, p.131).

Reading / memoing: an aspect of data analysis used in grounded theory in which the investigator reads through the textual data, makes notes on the margins of the text, and creates initial codes (Creswell, 1998, p. 148).

Saturation: the act of locating information to add to a specific category and continuing to look for information and to continue interviewing until new information does not provide additional insight into the category (Creswell, 1998, p. 151).

Social studies:

> Social studies is the integrated study of the social sciences and humanities to promote civic competence. Within the school program, social studies provides coordinated systematic study drawing upon such disciplines as anthropology, archeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and natural sciences. The primary purpose of social studies is to help young people develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world. (NCSS Definition approved, 1993, p.3).

Shallow learning: focuses on analyzing "superficial characteristics of a stimulus" (Carlson & Buskist, 1997, p.245), such as "lines, angles, brightness, pitch, and loudness" (Craik & Lockhart, 1972, p. 675) or "the rote repetition of information; repeating a given item over and over again" (Carlson & Buskist, 1997, p.244).

Theoretical sampling: the process of selecting participants based on their ability to "help the researcher best form the theory" (Creswell, 1998, p. 57).

Summary

The ability to learn new information is important in public school, yet, not all students know how to learn (McKeachie, 1988, p. 5). This study sought to understand how students learn in their social studies classes in terms of learning strategy/cognitive strategy/process variables use in the context of social studies classes. This study also sought to explore the frequency with which students use these strategies, the source/s through which the students learn about strategy usage, and the impact of the teacher's method of instruction on the students' strategy use. Consequently, this research could provide insight and benefit for both students and teachers. As part of this study, sample size, an interview format, and the participants' experiences with the educational system were sources of potential limitations. I have addressed these limitations and provided definitional terms for key terms from this chapter. The next chapter, chapter two, reviews the literature related to the research topic, and chapter three discusses the methodology for the study.

Chapter Two

Literature Review

Introduction

This literature review was developed as an ongoing process before, during, and at the conclusion of the research study. As the study unfolded, the researcher was led in several directions to seek out previous research related to this topic. What is presented below is the summation of this journey through the research literature.

Cognition is a complex topic. To better understand how students learn, this literature review presents insights on knowledge from cognitive psychology, teaching models from the fields of psychology / education, and research related to learning strategies. Looking at these different perspectives of the issue provided me with the necessary knowledge base about the previous accomplishments in the area of student learning.

This literature review begins with the theoretical foundations of the study and discusses different types of knowledge (declarative, procedural, and conditional knowledge) (Anderson, 2000, p. 238) and different types of processing (automatic, effortful) (Carlson & Buskist, 1997, p.244-246) from cognitive psychology. The literature review also discusses Marton and Sälsjö's (1976) research on the contextual use of learning strategies based on the learner's goals. Because learning in the classroom involves the interaction of the student and the teacher, the review also shows how teaching models can promote different types of processing depending on the ways that the teaching models are used. These teaching models include Bloom's taxonomy (Bloom et al., 1956), conceptual systems theory (Harvey, et al., 1961; Schroder, et al., 1967),

discovery and expository approaches to learning (Martorella, 2001, p. 200), and Gardner's theories on multiple intelligences (Gardner & Hatch, 1989).

Because teaching and learning are connected, researchers have created models and test instruments to describe students' use of learning/cognitive strategies and process variables. In terms of research, this review focuses upon the work of Biggs (1984), Zimmerman and Pons (1986), and Ablard and Lipschultz (1998). It concludes by discussing an expansion of the research with a focus on student learning within social studies classes.

Theoretical foundations for the study.

There are different types of knowledge including declarative, procedural, and conditional knowledge (Anderson, 2000, p. 238). Declarative knowledge is defined as "explicit knowledge that we can report and of which we are consciously aware" (Anderson, p. 238). An example would be a student who is learning how to locate historical research for a report in an American History class and who is conscious of each of the steps used to locate the research (Anderson, p. 281). Procedural knowledge is "knowledge of how to do things, and it is often implicit" (Anderson, p. 238). An example would be a student who has mastered the ability to locate historical research and who can do the task without using conscious awareness (Anderson, p. 236). For example, declarative knowledge is based on knowing what the term "strategies" means and procedural knowledge involves "understanding how to use strategies" (Paris and Barnes, 1989, p. 184). Conditional knowledge involves understanding "when and why strategies are effective" (Paris and Barnes, p. 184).

Using knowledge, individuals can approach the action of processing information using different ways such as automatic and effortful processing (Illustration 1). Automatic processing is defined as the "formation of memories of events and experiences with little or no attention or effort" (Carlson & Buskist, 1997, p. 246). In contrast to automatic processing is the concept of effortful processing, or processing information through practice or rehearsal.

Two forms of effortful processing are shallow processing and deep processing. Shallow processing, a term coined by Craik and Lockhart, (Carlson & Buskist, 1997, p.245) is defined as "analysis of superficial characteristics of a stimulus" (Carlson & Buskist, p.245) such as "lines, angles, brightness, pitch, and loudness" (Craik & Lockhart, 1972, p. 675). For example, when trying to memorize a word such Oklahoma City, the capital of the state of Oklahoma, a person using shallow processing might notice that the word Oklahoma City was written in black type, with upper and lower case letters in the Times New Roman font.

An example of shallow processing can be found in the related term, maintenance rehearsal. Maintenance rehearsal, also known as rote learning, is defined as "the rote repetition of information; repeating a given item over and over again" (Carlson & Buskist, 1997, p.244). For instance, students studying the social studies term, "agora" might repeat the term and its definition, "public market and meeting places" (Jacobs, Randolph, & LeVasseur, 2001, p. 166) over and over again until they have memorized the term and its definition. In trying to learn factual information such as the capitol of Oklahoma, a person using maintenance rehearsal (rote learning) would continually say or

continually write down the following statement: Oklahoma City is the capital of Oklahoma.

In contrast to shallow processing is deep processing. Deep processing is defined as "the analysis of the complex characteristics of a stimulus" (Carlson & Buskist, 1997, p.245) by considering the meaning of the stimulus and potentially using "enrichment or elaboration… to trigger associations, images, stories…sounds, sights, smells, and so on" in relation to the stimulus (Craik & Lockhart, 1972, p. 675). While shallow processing and deep processing are two ways of processing information, what people focus upon when they are rehearsing the information is the main difference between these two terms.

For example, a person using deep processing to learn more about the state of Oklahoma could consider that the meaning of the word Oklahoma is based on the Native American words for red people (Safra, 1998). The person could think about images of different types of traditional Native American homes such as tepees, longhouses, and chickees. They could remember stories about the Cherokee Indians' Trial of Tears and the taste of frybread, a Native American food.

A form of deep processing is elaborative rehearsal. Elaborative rehearsal is defined as the "processing information on a meaningful level, such as forming associations that relate the new material to information that the person already knows, thinking about the meaning of the material" and thinking about the information (Carlson & Buskist, 1997, p. 244). For instance, the person could think of reasons why Oklahoma is based on the Choctaw words for red people (http://www.state.ok.us/~oiac/hbpages.pdf) by considering the historical and geographical background of the state of Oklahoma. Some theories suggest that the name

change from Indian Territory to Oklahoma in 1907 (Baird & Goble, 1994, p. 36) is to honor and represent the Native Americans who made it their home. Archeological information shows Native Americans tribes have populated Oklahoma for 11,00 years ago (Baird & Goble, p. 36). Later in 1830s, Native Americans from the Cherokee, Creek, Choctaw, Chicasaw and Seminole tribes moved to Oklahoma (Baird & Goble, p. 127). Currently, "Oklahoma is home to thirty-nine tribal governments of which thirty-eight are federally recognized" (http://www.state.ok.us/~oiac/hbpages.pdf).

Contextual use of learning approaches.

Maintenance rehearsal and elaborative rehearsal are two ways to learn information, and they can be valuable in different contexts. In fact, Morris, Bransford, and Franks (1977) demonstrated the idea of "transfer of appropriate processing" (Morris et al., p. 528) through experimentation using shallow processing and deep processing, respectively. Transfer of appropriate processing says that the value of using deep processing or surface processing "must be defined relative to particular goals or purposes" (Morris, et al., p. 528) because "the quality and durability of the resulting memory traces can only be determined relative to the testing situation" (Morris, et al., p. 528).

An example of transfer of appropriate processing can be seen in the research conducted by Marton and Sälsjö (1976). These researchers found that students learned for the most part to adapt their method of learning (surface processing versus deep processing) based on the students' interpretations of the task. The study included 40 female freshman university students. They were randomly assigned to one of two experimental conditions (surface level processing versus deep level processing). The

experimenters told both groups to read a reading selection made up of three chapters and to be prepared to answer questions about the readings. At the end of chapter one, participants from the surface-level processing group were asked to answer questions that tapped surface level processing. Participants from the deep-level processing group were asked to answer questions that tapped deep level processing. This same procedure was also repeated after the students read chapter 2 of the reading selection.

After the students read chapter three, and they were asked to summarize the passage, and then answer questions that were specifically designed to promote surface level or deep level processing. The participants were also asked to speculate on the effects of the experimental manipulations upon their level of processing. To measure retention, the researchers administered the questions to the participants again 45 days later. The results showed that the participants' answers to specific questions varied in the participants' ability to summarize the passage, and the types of responses fell into three main categories.

In the first category of responses, participants were able to state the causes of the problem and the consequences of the problem. The participants were also able to make conclusions about the problem described within the passage. In the second category of responses, participants repeated what the author said about the topic of the passage, but participants did not discuss the causes or consequences of the problem, and they did not state conclusions about the passage topic. In the third category of responses, participants only stated the topic of the reading passage.

In terms of the surface level questions, participants in the experimental group assigned to answer surface level questions adapted their behavior to fit the questions. In

terms of deep level questions, participants in the experimental group assigned to answer deep level questions gave two types of responses. Some of the students responded to deep level questions by created a step-by-step strategy for recalling the reading passage and giving a 1 to 2 sentence summary of the passage. However, they did not engage in deep processing as the term was defined in the Marton and Sälsjö (1976) study. During interviews, they noted that they had trouble answering test questions that were based on deep level processing. In contrast, the other students in the deep-level processing group realized the predictability of the test questions and adapted the way in which they read and studied the reading passage to include deep processing.

Responses by the participants on their summaries of the reading passages showed differences between deep and shallow processors. Shallow processors remembered the passage and specific details with accuracy. In contrast, students from the deep processing group recalled information from the passage in a more general manner. When the researchers re-administered the test questions 45 days later, individuals from the surface level processing group recalled less of the surface level information, but they had higher retention on the more fundamental aspects of the reading passage. Participants from the deep level processing group had a higher level of retention including factual information from the reading passage even though they had used a deep processing approach to study the passage. Overall, the Marton and Sälsjö (1976) study is significant because it found that students learned the material differently using shallow or deep level processing based on the anticipated task (shallow or deep level questions).

Instructional theories and teaching methods

Again, the Marton and Sälsjö (1976) study was important because it showed that students to some degree adapt their level of processing to match the type of task. Although the students may not be familiar with the term, maintenance rehearsal, they may engaged in rote learning, the process of repeating a word or idea repeatedly either orally or mentally. However, not all students know ways to engage in elaborative rehearsal and students may not be familiar with the various instructional theories that can promote elaborative rehearsal. Since the classroom involves the student and the teacher, an exploration of instructional theories and teaching methods is relevant because instructional theories can provide step-by-step insight on ways to learn information from the teaching perspective. Researchers have developed instructional theories and teaching methods that demonstrate various methods for engaging in elaborative rehearsal, although these instructional theories can also be used for maintenance rehearsal (rote learning). The following instructional theories and teaching methods provide an algorithm for learning information: Bloom's taxonomy (Bloom, et al., 1956), conceptual systems theory (Harvey, et al., 1961; Schroder et al., 1967), Discovery and Expository approaches to learning (Martorella, 2001, p. 200), and Howard Gardner's theory of multiple intelligences (Gardner & Hatch, 1989). The following sections will provide an overview of these instructional theories and teaching methods and will explain how they can be used to promote maintenance rehearsal and elaborative rehearsal in students.

Bloom's taxonomy.

Bloom et al., (1956) created a taxonomy to better describe the mental processes of the cognitive domain. The levels of the taxonomy include knowledge, comprehension,

application, analysis, synthesis, and evaluation. Items from this taxonomy can be used to understand information and ideas.

Knowledge is defined as the "recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting" (Bloom et al., 1956, p. 201). An example would be a student memorizing the location of the Atlantic Ocean for a map test in his or her Geography class. A second example would be a student memorizing the fact that Christopher Columbus sailed the ocean blue in 1492.

In contrast to knowledge, comprehension refers to "a type of understanding or appreciation such that the individual knows what is being communicated and can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications" (Bloom, et al., 1956, p. 204). An example would be a student summarizing a chapter from the History textbook in his or her own words.

Following comprehension on the taxonomy is the term application. Application was defined as "the use of abstractions in particular and in concrete situations" (Bloom et al., 1956, p. 205). Abstractions could take the form of general ideas, procedural rules, or generalized methods of performing a task. Abstractions could also include technical principles, ideas, and theories that must be remembered by the student and applied to new situations. An example of application would be the student learning about the term peninsula and finding an example of a peninsula on the world map such as Florida in the United States. A second example of application would be the students' ability to predict a likely result that would occur when a situation at equilibrium is changed by one factor, such as the United States going to war with another country.

After application on the taxonomy is the term analysis. Analysis is defined as "the breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between the ideas expressed are made explicit" (Bloom et al., 1956, p. 205). Such analyses could be used to clarify communication, to indicate how communication was to be organized, and the way in which analysis manages to convey its effects, its basis, and its arrangements. An example would be a student comparing and contrasting the French Revolution with the American Revolution.

Next on the taxonomy is synthesis. Synthesis is defined as "putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements, etc., and arranging and combining them in such a way as to constitute a pattern or structure not clearly there before" (Bloom, et al., 1956, p.205). An example would be a student creating a song about the U. S. Civil War.

Evaluation is defined as "judgments about the value of material and methods for given purposes" (Bloom, et al., 1956, p. 205). During evaluation, individuals are expected to make judgments (quantitative and qualitative) about the extent to which materials and methods satisfy specific criteria. Individuals are expected to make use of a standard of appraisal. The criteria may be determined by the student or by someone else such as a teacher. For instance, students could demonstrate evaluation by engaging in a debate about the use of the nuclear bombs in World War II.

Bloom's taxonomy can be used to promote both maintenance rehearsal as well as elaborative rehearsal. For example, the teacher could promote maintenance rehearsal on the knowledge level of Bloom's taxonomy by asking students to memorize and recall

factual information such as the following: "George Washington was the first president of the United States". However, teachers could also promote elaborative rehearsal using the judgment level of Bloom's taxonomy by asking students to make judgments about the following statement: "History repeats itself."

Depending upon the ways that they are used, the higher levels of Bloom's taxonomy can encourage students to understand and use ideas (elaborative rehearsal). Yet, in order to engage in elaborative rehearsal, the students need process ideas deeply. If the students are using the higher levels of Bloom's taxonomy to better understand ideas, mentally work with ideas, and connect ideas to their previous experiences, then the students are engaging in elaborative rehearsal. However, if a teacher, parent, or textbook does the mental work and the students are merely parroting back using rote learning, then even the higher level tasks using Bloom's taxonomy can be transformed into rote learning. For instance, if students merely parrot back the teacher's views on the statement "History repeats itself", then the students are engaging in maintenance rehearsal (rote learning).

Conceptual systems theory

Like Bloom's taxonomy, conceptual systems theory also suggests that there are levels of cognition. Conceptual systems theory is based on the examination of the dimensions of a problem using "judgments, attitudes, decisions, or perceptions" (Schroder, Driver, & Streufert, 1967, p. 7) in order to create "integratively complex connections or rules" (Schroder, et al., 1967, p. 7). The levels within conceptual systems theory are based on a person's ability to create connections between rules. The four

levels of "integrative complexity" (Joyce & Weil, 2000, p. 99) are low complexity, moderate complexity, moderately high complexity, and high complexity.

Within the classroom, the goal of conceptual systems theory is both to match instruction to the student's level of cognitive complexity and to encourage students to progress to a higher level of cognitive complexity (Harvey et al., 1961). For instance, low complexity is defined as thinking where "stimuli either fit into a category or are excluded from consideration. There is no conceptual apparatus that can generate alternatives; the result is fast 'closure' in choice or conflict situations" (Schroder et al., 1967, p. 16-17). Conflicting perspectives are avoided or misunderstood in order to maintain absolutist thinking. "Rules determine conditions that govern the choice of stimulus categories" (Schroder et al., p. 21).

Moderate complexity is defined as "the presence of a conceptual apparatus that is able to generate alternative organizations of dimensions. That is, if there are three dimensions, such as structure could provide at least two possible rules for combining these dimensions" (Schroder, et al., 1967, p. 18). Within this stage, individuals are able to create conditional rules and value some rules higher than other rules; however, they are characterized by ambivalence because they generate options, but do not have a means for organizing their choices or evaluating what is right or wrong (Schroder et al.). Individuals using moderate complexity have additional rules that "specify the conditions under which alternate schemata are used" unlike individuals using low complexity (Schroder et al., p. 21). While individuals using moderate complexity are able to "delineate several alternative ways of structuring the world" and not engage in absolutism or black and white thinking, they have trouble dealing with authority figures that expose

the fact that the individual is still struggling against the old rules that were prominent in the low complexity stage (Joyce & Weil, 2000, p. 99-100).

Moderately high complexity is defined as the ability to combine and use "two alternative systems of interpretation greatly increase the number of alternative resolutions that can be generated" by being "open to a number of alternative pressures" where the person can "observe the effects of his own behavior from several points of view; he can simultaneously weigh the effects of taking different views" (Schroder, Driver, & Streufert, 1967, p. 21). In this stage, individuals have additional rules for comparing schemata and creating different, relatively independent organizational structures. Individuals are not limited to established rules, but are able to project into the future (Schroder, et al.).

Following moderately high complexity is high complexity. High complexity is defined as the ability to compare "different systems of interacting variables" in a highly abstract manner (Schroder, et al., 1967, p. 22). This stage is characterized by an ability to generate a theory with rules based on complex relations between various structures and the "potential to organize different structures of interacting schemata" (Joyce & Weil, 2000, p. 100).

Although conceptual systems theory is an instructional strategy, students can use these procedures independent of the teacher in order to learn class material. The mental manipulations of material particularly at the higher levels lend themselves to elaborative rehearsal. However, if the teacher asks the students closed questions (ex. What is the capital of Oklahoma?), that promote quick closure in a situation, the students could engage in mental rehearsal.

Discovery approaches and expository approaches

Discovery and expository approaches are two instructional strategies that help students to understand concepts, and to develop and test generalizations (Martorella, 2001, p. 200). Discovery approaches are defined as a teaching process in which the teacher does not explain the concept or generalization to students, but teaches students how to understand concepts and create generalizations and recognize patterns on their own via student discover in which the students "discover attributes unique to the concept and infer its rule" (Martorella, p. 192; Martorella, p. 201). Teachers using discovery approaches teach concepts using eight steps (Martorella, p. 192).

> 1. Identify the set of examples and nonexamples you [the teacher] plan to use and place them in some logical order for presentation. Include at least one example that best or most clearly illustrates an ideal type of the concept.
> 2. Include in the materials or oral instructions several clues, directions, questions, and student activities that draw students' attention to the critical attributes and to the similarities and differences in the examples and nonexamples used.
> 3. Direct students to compare all illustrations with the best example and provide feedback on the adequacy of their comparisons.
> 4. If critical attributes cannot be clearly identified or are ambiguous, focus attention on the salient features of the best example.
> 5. When a clear definition of a concept exists, elicit or state it at some point in the instruction in terms that are meaningful to the students.
> 6. Through discussion, place the concept in context with other related concepts that are part of the students' prior knowledge.
> 7. Assess concept mastery at a minimal level – namely, whether students can correctly discriminate between new examples and nonexamples.
> 8. Assess concept mastery at a more advanced level: for example, ask students to generate new exemplars or apply the concept to new situations" (Martorella, p. 192).

In terms of teaching generalizations, the discovery approach is done by questioning and explaining to students the similarities, differences, patterns, and trends in the data. Then, teachers help students summarize the students' conclusions and discover the unstated generalization (Martorella, p. 201).

In contrast to the discovery approaches are expository approaches to learning. Expository approaches for teaching concepts and generalizations are defined as a teaching technique where the teacher is the main source of information. The teacher then explicitly defines the elements that make up the concept for the students in terms of the critical attributes and the concept rule in order to provide the "data for the students in the most direct way possible" (Martorella, p. 193; Martorella, p. 201). In terms of generalizations, discovery approaches involves that teacher providing the generalization and the students applying the generalization to new situations (Martorella, p. 204-205). The expository approaches to generalizations involves the following steps (Martorella, p. 205):

> 1. State, write, or call attention to the generalization that is a learning objective for the lesson.
> 2. Review major concepts that are part of the generalization.
> 3. Provide instructions, questions, cases, relevant materials, and assistance to illustrate and verify the generalization.
> 4. Have students identify, find, or create new cases of the generalization" (Martorella, p. 205).

While the discovery and expository approaches are defined as teaching strategies (Martorella, p. 200), students could use these techniques on their own as learning strategies to help them to understand concepts and to create generalizations. These approaches can also be used to promote elaborative rehearsal and maintenance rehearsal. For instance, in discovery learning, the act of applying concepts to new situations, can involve elaborative rehearsal. However, questions that the teacher uses to draw in the students' attention to the critical attributes can be used to promote maintenance rehearsal. In expository learning, teachers can promote elaborative rehearsal by having the students identify a generalization in a new situation. Yet, if the teacher asking the students basic

questions to review the major concepts of the generalization, this action can encourage students to engage in maintenance rehearsal (rote learning).

Gardner's theory of multiple intelligences.

Howard Gardner suggested that there are eight types of intelligence (Checkley, 1997, p. 9; Nicholson-Nelson & Moss, 1998). These types of intelligence include logical-mathematical, linguistic, musical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturist intelligence (Checkley, p. 9; Nicholson-Nelson & Moss). Logical-mathematical intelligence is defined as "sensitivity to, and capacity to discern, logical or numerical patterns; ability to handle long chains of reasoning" (Gardner & Hatch, 1989, p. 6). Linguistic intelligence is defined as "sensitivity to sounds, rhythms, and meanings of words; sensitivity to the different functions of language" (Gardner & Hatch, p.6). Musical intelligence is defined as "abilities to produce and appreciate rhythm, pitch, and timbre; appreciation of the forms of musical expressiveness" (Gardner & Hatch, p.6). Spatial intelligence is defined as "capacities to perceive the visual-spatial world accurately and to perform transformation on one's initial perceptions" (Gardner & Hatch, p.6). Bodily-kinesthetic intelligence is defined as "abilities to control one's body movements and to handle objects skillfully" (Gardner & Hatch, p.6). Interpersonal intelligence is defined as "capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people" (Gardner & Hatch, p.6). Intrapersonal intelligence is defined as "access to one's own feelings and the ability to discriminate among them and draw upon them to guide behavior; knowledge of one's own strengths, weaknesses, desires, and intelligences" (Gardner & Hatch, p.6). Naturalist intelligence is the ability to recognize and classify objects (Checkley, 1997, p.

9) "including the capacity to recognize flora and fauna; to make distinctions in the natural world; and to use this ability productively in activities such as hunting, farming, and biological science… in order to see how nature interacts with civilization, the symbolic relationships inherent in nature, and the life cycles of nature" (Nicholson-Nelson & Moss, p.12).

Although Gardner's eight types of multiple intelligences can be used for maintenance rehearsal, they can also be used as part of elaborative rehearsal. For example, linguistic intelligence is defined as "sensitivity to sounds, rhythms, and meanings of words; sensitivity to the different functions of language" (Gardner & Hatch, 1989, p.6). If the teacher asked the students to memorize the Gettysburg Address, students could use maintenance rehearsal or rote learning to memorize the speech. If the teacher wanted to tap into elaborative rehearsal, the teacher could have the students pretend to be President Lincoln the days before the Gettysburg Address. Students could create their own tribute to the fallen soldiers of the battle of Gettysburg.

Related studies

Although the instructional theories and teaching methods emphasize ways for teacher to teach the class material to students, students who understand these instructional theories and teaching methods can use them irrespective of the teacher in order to learn information. In contrast to the teaching methods that are designed as ways to teach class material, the learning strategies were specifically designed to understand the strategies that students use to learn the class material.

Biggs (1984).

Biggs (1984) suggested that students have three different motivations and use three different learning strategies (mesostrategies) to meet their needs. Biggs defined mesostrategies as "learning styles and study strategies in the context of academic performance" (p. 116). In terms of motivation and mesostrategy use, Biggs suggested that there are three basic motives and strategies for studying material in schools. The three motives were called instrumental, intrinsic, and achievement motivation while the three strategies were called reproducing, meaning, and organizing.

In terms of the three types of motives (instrumental, intrinsic, and achievement), Biggs (1984) defined instrumental motivation occurs as motivation in which the "main purpose is to gain a qualification, with pass-only aspirations and a corresponding fear of failure" (p. 118). Intrinsic motivation was defined as motivation in which a person will "study to actualize interest and competence in particular academic interest" (Biggs, p. 118). Finally, achievement motivation was defined as motivation in which the person seeks to "obtain [the] highest grades, whether or not the material is interesting" (Biggs, p. 118).

In terms of the three strategies (reproducing, meaning, and organizing), Biggs (1984) suggested that a person engaging in a reproducing strategy will "limit target to bare essentials and reproduce through rote learning" (p. 118). He suggested that a person engaging in a meaning strategy would "read widely and interrelate new information with previous relevant knowledge" (Biggs, p.118). Meanwhile, students who engaged in an organizing strategy will follow up all of the suggested readings, schedule their time appropriately, and behave like a model students (Biggs, p. 118).

Biggs (1984) showed that among those students with high grades who both used reproducing strategy and who were only motivated by grades (achievement motivation) used rote learning. Biggs found that rote learning was "not detrimental to either their [the student's] self-ratings of performance or to their satisfaction" (p. 126). The study also found that use of a meaningful strategy was "not conductive to perceived success with students who [were] solely achievement motivated" (Biggs, p. 126). "In high school, the solely intrinsically motivated,...the top-performing intrinsically and achievement motivated", and unmotivated college students saw the meaningful strategy "as improving their performance" (Biggs, p. 126). In terms of the organizing strategy, Biggs found that out of a sample of 3,595 students, only 2 subjects from the high achieving students used organizing strategies and all of the low achieving students used this strategy. All of the students were satisfied using the organizing strategy, but only the low achieving students felt that the organizing strategy helped them with their academic performance. (Biggs, p. 126-127). Biggs went on to suggest that high achieving students might be using strategies not captured by the study.

While Biggs (1984) focused on developing a different combination of motivation and learning strategies, Zimmerman and Pons (1986) focused on self-regulated learning strategies and achievement and Ablard and Lipschultz (1998) focused on self-regulated learning strategies and motivation in terms of mastery and performance goals. Specifically, a study by Zimmerman and Pons (1986) sought to better understand a subcategory of learning strategies, self-regulated and non-self regulated learning strategies. In the 1986 study, Zimmerman and Pons developed the SRLIS (Self-regulated Learning Interview Schedule) to measure self-regulated learning strategies and non-self-

regulated learning strategies. Understanding their research can give background and insight into learning strategies used by students in the classroom.

Zimmerman and Pons (1986).

Zimmerman and Pons (1986) sought to develop a measure for self-regulated learning strategy measure. Self-regulated learning is defined as students who use active participation in their own learning process in terms of their metacognition, motivation, and behavior (Zimmerman & Pons, p. 284). The study also wanted to study the relationship between the students' use of their self-regulated learning strategies and their scholastic achievement. Specifically in terms of self-regulated strategies, the study hypothesized that students with high achievement tracts would use more self-regulated strategies compared to students on low achievement tracts. The second objective looked at non-self-regulated strategies and hypothesized those students on low achievement tracts will use more self-regulated strategies compared to students on high achievement tracts.

The sample included randomly selected 40 sophomores from the advanced tract and 40 sophomores from low tract classes from one suburban, middle class high school. The test instrument included the Metropolitan Achievement Test (MAT) scores and the questions for the instrument to be created in the study, the Self-regulated Learning Interview Schedule. The instrument included 14 self-regulated learning strategies. These included "seeking information, keeping records and monitoring, organizing and transforming, seeking teacher assistance, seeking peer assistance, adult assistance, self consequences, reviewing notes/reviewing text, and self-evaluation" (Zimmerman & Pons,

1986, p. 622-623). The instrument also included one non-self-regulated learning strategy known as "other" (Zimmerman & Pons, p., 623).

Responses from the interview were classified into categories. Based on the responses, the study measured strategy consistency (the consistency of using each strategy), strategy use (dichotomously measuring if each strategy was used or not), and strategy frequency (the number of times a specific strategy was mentioned during the interview). A discriminant function analysis identified strategy consistency as the most efficient measure to use.

The study also wanted to identify learning strategy categories that distinguished students from the high and low achievement tracts. The study found that there were significant differences between low and high achievement tracts on all fifteen of the learning strategies. Cannonical correlational coefficients showed that students from the high achievement tract differentiated students from the low achievement tracts on the following learning strategies from the most differentiation to the least differentiation: "seeking information, keeping records and monitoring, organizing and transforming, seeking teacher assistance, seeking peer assistance, adult assistance, self consequences, reviewing notes/reviewing text, and self-evaluation" (Zimmerman & Pons, 1986, p.622-623). All of the self-regulated learning categories were significant except self-evaluation. The "other" category showed a significant difference between the high achievement tracts and low achievement tracts with a negative correlation between high achievement students and the "other" category of responses. (Zimmerman & Pons, p., 623).

Responses from the other category of learning strategies consisted of three precalculated subclasses, "unscorable responses, reactive statements, and will power

statements" (Zimmerman & Pons, 1986, p. 623). No unscorable responses were obtained during the interviews. Reactive statements were based on "a lack of personal initiative" (Zimmerman & Pons, p. 623) such as preparing for an exam by following the teacher's instructions. Low achievers made reactive statements more than high achievers, but not significantly more. Will power statements were based on not specific strategies but on resolve based on working harder. Low achievers made will power statements, significantly more (almost twice as more) as high achievers. Self-regulation scores did correlate with Metropolitan Achievement Test scores. Total scores on the self-regulating learning strategies measure correlated with the Metropolitan Achievement Test subtest of English achievement of .56. Total scores on the self-regulated learning strategy measure correlated with the mathematics achievement subtest at .55.

In short, the work by Zimmerman and Pons (1986) was important because it helped to measure self-regulated strategies and included different types of learning strategies. Ablard and Lipschultz (1998) extended the work of Zimmerman and Pons (1986) by focusing on self-regulated learning strategies and student motivation.

Ablard and Lipschultz (1998).

Ablard and Lipschultz's (1998) goal was to see if students with high levels of advanced reasoning were both more aware of self-regulated strategies and used more self-regulating strategies compared to students with low levels of reasoning. The study also wanted to see if students with high levels of advanced reasoning were more likely to focus on mastery goals, performance goals, or a combination of these two types of goals. The study hypothesized that increased goal orientation was associated with increased use of self-regulation strategies. Finally, the study wanted to study the relationship among

gender, advance reasoning, and achievement goals to self-regulated learning among high achievers. High achievers were defined as students who scored in the top three percent on an achievement test. The study hypothesized that girls would use self-regulated learning strategies especially the following learning strategies "optimizing the environment or optimizing self-regulation" (Ablard & Lipschultz, p. 95). The study also looked for a "possible interaction effect for achievement goals and gender on self-regulated learning" (Ablard & Lipschultz, p. 95).

The participants consisted of 222 students in the 7th grade who scored within the top 3 percent on three achievement tests (the California Achievement Tests, the Comprehensive Tests of Basic Skills, and the Metropolitan Achievement Tests)(Ablard & Lipschultz, 1998, p. 95). The test instruments were the Self-regulated Learning Interview Schedule (SRLIS) and Patterns of Adaptive Learning Surveys (PALS). The PALS measure had two subtests, the Task-Orientation scale and the Ability-Oriented scale. The Task-Oriented scale measured items "about working for personal interest or mastery" (Ablard & Lipschultz, p. 96), and the Ability-Oriented scale measured items about "working for outstanding performance" (Ablard & Lipschultz, p. 96).

Ablard and Lipschultz (1998) found that some students used strategies from the SRLIS, some students used strategies not listed on the SRLIS, and some students did not use self-regulated learning strategies at all. "Students reported an average of one strategy per scenario are varied widely in their use of self-regulated learning strategies" (Ablard & Lipschultz, p. 96). The five most frequently reported self-regulated learning strategies in order were self-regulating, goal setting and planning, organizing and transforming, reviewing notes, and record keeping and monitoring. Advanced reasoning (Standard

Achievement Test – SAT 1 Scores), gender, goal orientation (performance and mastery) were significantly related to the total score on the self-regulated learning measure and explained eighteen percent of the variation of the self-regulated learning strategy scores.

The study also looked at the relation of achievement goals (performance and relational goals) to self-regulated learning. The total self-regulated learning score was significantly related to achievement goals. Student scores were broken down into high/low performance goals and high/low relational goals. Multiple comparisons showed that students with low mastery goals and low performance goals were significantly lower on their total self-regulated learning compared to both the students with high mastery goals and low performance goals and the students with high performance and high mastery goals. There was no significant difference between students with high performance/low mastery goals compared to the other goals.

On the measure of advanced reasoning the (SAT math and verbal scores), gender was significantly related to advanced reasoning. Females scored higher on the mastery goal orientation scale compared to males. Females were significantly higher on their total self-regulated learning score compared to boys. The 14 self-regulated learning strategies were significantly related to gender. Girls used the following strategies significantly more than boys: organizing and transforming, goal setting and planning, keeping records and monitoring, seeking assistance from peers, and reviewing notes with the strongest difference between genders was the learning strategy organizing and transforming. Girls were significantly more likely to use self-regulated learning strategies compared to boys in the following scenarios: the student is writing a paper, the student is completing math homework and not understanding the problem, the student is

preparing for tests in reading and writing, and the student is having difficulty completing homework assignments because there are more interesting things that the student would rather do instead of homework.

The Ablard and Lipschultz (1998) study was important because it showed that some students are using strategies other than those listed in the SRLIS (Self-regulated Learning Interview Schedule). This dissertation hopes to expand upon the work of Zimmerman and Pons (1986) and Ablard and Lispchultz by exploring additional specific learning strategies not mentioned in the SRLIS but are used by students in their social studies classes.

Clearly, strategy use plays a role in the classroom. The Biggs (1984) study studied strategy usage by using three strategies and their relation to three types of student motivation. Biggs was important because the study helped to clarify the different types of motivations and strategies used by students in the classroom. Later, Zimmerman and Pons (1986) identified learning strategies with a focus on self-regulated learning strategies and achievement level. Ablard and Lipschultz (1988) extended the work of Zimmerman and Pons by using their test instrument to study the relation of self-regulated achievement to mastery and performance goals. These studies noted that students were using strategies other than those identified by them (Ablard & Lipschultz; Biggs). This dissertation seeks to extend the work of previous research (Ablard & Lipschultz; Biggs; Zimmerman and Pons) by seeking to further clarify the learning strategies used by students in high school social studies classes.

Summary

To understand how students learn in the classroom, this literature review discussed different ways of learning information and focused on two approaches, maintenance rehearsal and elaborative rehearsal. These approaches offer a theoretical structure for understanding cognitive processing in the classroom. In terms of cognitive processing, research by Marton and Sälsjö (1976) showed that to an extent, students could learn to memorize or focus on meaning when learning new information based on the types of test questions. Because learning in the classroom involves a combination of students and teachers, this literature review also looked at the following instructional theories and teaching methods: Bloom's taxonomy (Bloom et al., 1956), conceptual systems theory (Harvey, et al., 1961; Schroder, et al., 1967), Discovery and Expository approaches to learning (Martorella, 2001, p. 200), and Howard Gardner's theory of multiple intelligences (Gardner & Hatch, 1989). This literature review showed that depending upon the way in which they are used, the instructional theories and teaching methods could be used to emphasize maintenance rehearsal or elaborative rehearsal. After exploring insight from instructional theories and teaching methods, this literature review focused on research in relation to learning strategies. For example, Biggs (1984) developed a model that included three learning strategies, Zimmerman and Pons (1986) developed a test instrument that contained a list of learning strategies, and Ablard and Lipschultz (1998) measured the learning strategies used by high achieving students using the SRLIS. However, one limitation of these studies (Ablard & Lipschultz; Biggs) was that these studies suggested that students were using additional learning strategies not captured in their research. This dissertation sought to expand upon the work of previous

researchers to better understand the learning strategies used by students specifically in relation to their high school social studies classes.

In summary, chapter two discussed related literature relevant to the study. This section discussed the theoretical foundations for this study including maintenance rehearsal and elaborative rehearsal and the ability of students to basically adapt their learning strategies to the task. The literature review also discussed the ability to use teaching models to promote maintenance rehearsal and elaborative rehearsal, research about learning strategies, and the goal of this dissertation to build upon past research to better understand learning strategy use by high school students in their social studies classes. Chapter three discusses the methodology for this dissertation.

Chapter Three

Methodology

This section discusses the following: the rationale for using a qualitative approach, a description of grounded theory, selection of the participants, data analysis (interviews, instrumentation, variables), procedures, data analysis, and data cleaning.

Rationale for using the qualitative approach

The main goal of this study was to better understand how students learn in the social studies classroom. Previous research by Biggs (1984) and Zimmerman and Pons (1986) developed a theoretical model and a test instrument to describe learning strategies used by students. These researchers provided insight into the topic area by identifying some of the learning strategies that were useful in student learning. Yet, these researchers (Biggs; Zimmerman & Pons) stated that additional work was needed to describe students who do not fit their model / test instrument. Rather than test pre-constructed ideas about how students learn, this study recognized the complexity of the situation and the need to obtain rich information. Therefore, this research incorporated the use of structured interviews, an approach used by Marton and Svensson (1979) and Laurillard (1979). Based on this form of research, I attempted to explain the way that students learned information in these social studies classrooms.

Giving students a list of possible ways of learning material and asking them if they do or do not use these techniques could bias the student response and could bias students from mentioning techniques that are not on the list. Therefore, I specifically kept the questions opened ended. Using open-ended questions in the study could open understanding to previously unrecognized strategies for learning class material, and

might deflect a tendency by the participants to make untruthful but socially appropriate responses. Fortunately, most students and all of the teachers were able to discuss the way or ways that they learned information in their social studies class using an open-ended question approach. Participants were overall fairly candid about their strategy use.

Grounded theory: An overview.

Barney Glaser and Anselm Strauss, two sociologists, developed grounded theory in 1967 (Strauss, 1987, p. i) in order to generate and test theories (Strauss, 1987, p. xi). They developed the grounded theory approach in response to a priori theory development and advocate theory being not by experience but through reason (Wesbster's New Collegiate Dictionary, 1951). These founders suggested that theory development should be "grounded" and therefore based on field data "especially in the actions, interactions, and social processes of people" (Creswell, 1998, p. 56).

Like other methodological approaches, the grounded theory approach has both benefits and limitations. Benefits of using grounded theory are that interviews can potentially provide richer detail than traditional survey instruments (Strauss, 1987, p. 2) and it provides an opportunity to develop a theory. Yet, there are several considerations that must be addressed when using the grounded theory approach. To overcome potential bias, "the investigator needs to set aside, as much as possible, theoretical ideas or notions so that the analytical, substantial theory can emerge" (Creswell, 1998, p. 58). Despite the evolving, inductive, nature of grounded theory, the investigator must approach grounded theory in a systematic manner using the specified steps of data analysis. "Determining when the categories are saturated or when the theory is sufficiently detailed" can also be a challenge (Creswell, p. 58). Another weakness of grounded theory is that it tends to be

"weak on cross-comparisons because they [the researchers] often study only single situations, organization, and institutions" in a study (Strauss, 1987, p. 2). Finally, the resulting theory must be sure to include the following components: "a central phenomenon, causal conditions, strategies, conditions and context, and consequences" (Creswell, p. 58).

Selection of the sample.

In the grounded theory approach, the site and individuals are based on "locating a homogenous sample" consisting of "multiple individuals who have responded to action or participated in a process about a central phenomenon" (Creswell, 1998, p. 112). The grounded theory approach suggests the use of theoretical sampling. Theoretical sampling is defined as the process of selecting participants based on their ability to "help the researcher best form the theory" (Creswell, p. 57).

Because the study focused on learning and cognitive strategies used by students, the sample was based on experiences of male and female students. In order to obtain a homogenous sample, the participants were limited to 10^{th} grade social studies students and their teachers in a community located in a southwestern United States. The social studies classes were limited to 10^{th} grade United States History (average and advanced level classes) as a way of further limiting the sample. The U.S. History class focused on content from the post Civil War to the present time. No other history classes or elective classes in social studies were used as a part of this sample.

In terms of grade level, ninth graders were not chosen for this study due to the developmental changes that take place during this age period. In addition, at the beginning of the school year, ninth graders could face an adjustment period from junior

high school to the high school environment. Seniors or 12th graders were not chosen due to potential cases of senioritis (a general disinterest in academics) that could cause students to be disinterested in participating in the study. Seniors who are disinterested in academics might provide less insight into learning processes compared to the 10th or 11th grade students. I ultimately focused this study on 10th grade students because of the willingness of two 10th grade teachers to participate in this study.

The study limited potential subjects to students who were successful within the pre-selected sample of advanced and regular level social studies classes taught using indirect instruction and direct instruction. Successful students were defined as students with a grade in their social studies class of a "B" or better. Average level social studies classes (also known as regular level social studies classes) were defined as social studies classes with content designed to meet the state standards. Advanced level social studies classes were defined as social studies classes with content designed for above average students. Advanced and regular classes were chosen with the help of administrators and social studies teachers as being representative of advanced and regular level classes in the district.

The teachers were chosen for a variety of reasons: their willingness to participate in this study, the fact that they both taught 10th grade students, and the fact that one teacher taught primarily using a direct instructional approach while the other teacher taught primarily using an indirect instructional approach. Indirect instruction is defined as an interactive instructional model that emphasizes "inquiry, problem solving, and discovery learning" (Borich, 1994, p. 284). Direct instruction is defined as "a pattern of teaching that consists of the teacher's explaining a new concept or skill to a large group

of students, having them test their understanding by practicing under teacher direction (this is, controlled practice), and encouraging them to continue to practice under teacher guidance (guided practice)" (Joyce & Weil, 2000, p.339).

Description of the sample.

The study included 40 students and 2 teachers. Because the instructional style could affect the outcome of the study, the primary investigator chose one teacher who primarily used the direct instruction method, and one teacher who primarily used the indirect instruction method. Because the class level (average vs. advanced) could play a factor in the study, the primary investigator created four cells (Table 1): direct instruction with average students, direct instruction with advanced students, indirect instruction with average students, and indirect instruction with advanced students. Each cell contained ten students (5 males and 5 females).

Description of the school district.

The public school is located in a school district in the southwestern part of the United States. The school has approximately 2,000 students and is located in suburban area of a fairly middle class city consisting of slightly less than 100,000 people. The school contains qualifiers for national merit scholarships as well as at risk students.

Description of the teacher participants.

I interviewed two high school social studies teachers for this study. Both teacher participants teach at the same school, and neither teacher used exclusively direct or indirect instruction. The teachers were chosen because their teaching style tended to emphasize more of a direct instruction or indirect instruction approach. Because the first teacher taught generally via direct instruction, I gave him a pseudonym that begins with

the letter "d" (Mr. Duncan). The second teacher participant taught generally through indirect instruction; therefore, I gave him a pseudonym that beings with the letter "i" (Mr. Ivan).

Mr. Duncan is 42 years old licensed teacher. He has a master's degree in education and has spent 13 years teaching in the classroom. His exams are typically multiple choice and essay in format. His teaching style is primarily direct instruction. This classification of his instructional style is based on several classroom observations as well as my discussions with him regarding this topic.

I asked the teacher participant to describe his teaching style. Mr. Duncan explained,

> Yeah…A lot of it…quite a bit of it's lecture based, especially in the first two units as I have said. Uh...and then it turns into more of a cooperative learning and group work…. I believe that the kids will learn more from each other…uh…and you can see that they do learn more…you can see that in little people kids. You take a little kid and you never put them in a day-care center, and all of a sudden in their fifth year you put them in a day-care center… you massive changes in that person. Well, I think the massive group learning, and I think the same thing is in these classes. I try to be varied, but, again, it's basic lecture…

Mr. Ivan is a 31 years old licensed teacher who has just completed a doctorate in education and has spent 8 years teaching in the public schools. His teaching style is primarily indirect instruction. In terms of his tests, students can take their class exams in one of three forms, oral, essay or multiple-choice. Once again, I observed Mr. Ivan's classroom teaching on several occasions and met with him to discuss his teaching style. I also asked Mr. Ivan to describe his teaching style. He replied,

> …. I tend to ask questions and draw students into the classroom discussion when I can. There are obviously times that you lecture because you have to get the material done. Those who think that you can simply do games and simulations or alternative assessment throughout their entire career and every day in the curriculum are naive, if you ask me because there's certain situations that you

> have to use different kinds of teaching styles. For example, you've got some kids that are visual learners versus auditory. You've got to adapt to that. That doesn't mean every class you change it. Absolutely not. What I like to do is have direct instruction, some kind of case study, some kind of (problems) where they do work at their desk, they investigate, they actually have to dig up and do research, and then, I like to have a simulation. This coming chapter, we're going to do all those things wrapped into the entire unit. Are we going to watch a movie? Yes. That's a learning style for some people. Is it the cure-all for everything? Absolutely not. But you've got to have some kind of diversity somewhere in there or you're in a rut, and the kids know it, and it gets very old. You'll lose them.

Description of the students.

All of the students were 10th graders from average and advanced classes that emphasized direct or indirect instruction. All of the students spoke fluent English and all of the students were earning an "A" or a "B" in their social studies class. Because the study includes interviews with 40 participants, I refer to students by number such as participant 20.

In terms of race (Table 2), the direct instruction cell with average students contained 5 Caucasian females and 5 Caucasian males. The direct instruction cell with advanced students contained 5 Caucasian females and 5 Caucasian males. In terms of indirect instruction, the cell with average students contained 4 Caucasian females, 1 Hispanic female, 4 Caucasian males, and 1 male of mixed race. The indirect instruction cell with advanced students contained 4 Caucasian females, 1 female of mixed race, 3 Caucasian males, 1 Native American male, and 1 male of mixed race.

In terms of age (Table 3), the direct instruction cell with average students had 2 female students who were 16 years old, 3 female students who were 17 years old, 1 male student who was 16 years old, and 4 male students who were 17 years old. The direct instruction cell with advanced students contained 2 females, 3 females 17 years of age, 4 males age 17, and 1 male 18 years of age. For indirect instruction, the cell with average

students contained 2 females 15 years old, 2 females 16 years old, 1 female 17 years of age, 1 male 15 years old, 2 males 16 years old, and 2 males 17 years old. The cell with indirect instruction with advanced students contained 3 females 15 years old, 2 females 16 years old, 4 males sixteen years old, and 1 male 17 years old.

Description of the primary investigator.

The primary investigator is a doctoral student who was teaching middle school students at the time of this study. I knew Mr. Ivan before the study as a teacher who supervised students in a social studies program, but I did not know Mr. Duncan prior to the study. Although I did not directly know the students participants before this study, I had worked as a substitute teacher at the school site the previous year. Through my discussions with my doctoral committee members, we determined that the local high school in which these teachers worked would function as an appropriate site for conducting this study.

Data collection

Interviews.

The purpose of the interviews was to saturate the categories (Creswell, 1998, p. 56). Saturation is defined as the act of locating information to add to a specific category and continuing to look for information and to continue interviewing until new information does not provide additional insight into the category (Creswell, p. 56; 151). A core category is defined as "a category that is central to the integration of the theory" (Strauss, 1987, p. 21) and a category is defined as "a unit of information composed of events, happenings, and instances" (Creswell, p. 56). In addition, the grounded theory approach typically involves interviews of 20 to 30 participants conducted over several

visits to the field site (Creswell, p. 56). In order to saturate the categories for this dissertation, I interviewed 40 students and 2 teachers. The interviews occurred over several visits. Specifically, (Table 1) the researcher interviewed an equal number of male and female students from 2 advanced social studies classes, 2 average social studies classes, and their teachers. Following the grounded theory tradition, the primary investigator engaged in the constant comparative method of data analysis both during and after the interviews with the participants (Creswell, p. 56). The constant comparative method of data analysis is defined as the process of taking information from data collection and comparing it to emerging categories" (Creswell, p. 57).

Interviews were administered during the third nine-week term so that teachers and students would have had an extended time period to work together. Interviews were done using open-ended questions as part of an in-depth interview. Each interview lasted approximately ten to twenty minutes and was conducted during the school day. In order to ensure accuracy in reporting quotes, I tape recorded the interviews and referred to the participants in the dissertation via pseudonyms. Interviews followed the procedures outlined in the Internal Review Board (IRB) consent form (Appendix A - D) and attempted to answer the following questions. What learning strategies, cognitive strategies, or process variables do students use to learn information in social studies classes? How often do students use these strategies? How do students acquire these strategies? Does the teacher's methods of instruction have any effect on the students' use of learning strategies, cognitive strategies, or process variables?

Instrumentation.

Name of the test instrument.

During the interviews, demographic questions were asked to provide additional insight about the participants. The answers to these questions were recorded along with the interview questions. Then based on these questions, demographic statistics were computed. The student participants answered questions on the ways that they learned information in their social studies class. The teacher participants answered questions on the ways that they thought that their students learned information in the teacher's social studies class.

Content of the test instrument.

Separate questions were developed for the students and the teachers (Appendix E and F). In addition, follow-up questions were asked to both the students and teachers when their answers seemed unclear. These questions were not written; rather, they were clarifying in nature and varied during each interview. Some examples were, "Can you clarify that?", "Can you explain that?", "I'm not sure what you meant; explain it again." The investigator did not feel that these questions had any adverse results on the outcomes of the study.

Procedures

Two teachers were selected based on their teaching style and their willingness to participate in the study. Through conversations with the teacher participants, classroom observations, and conversations with the teacher's colleagues each individual's teacher style was evaluated as being direct or indirect. In terms of selecting student participants, it was explained to the participating teachers that the study would consist of four cells based on gender (male and female), class level (average or advanced), and method of instruction (direct or indirect instruction). The teachers helped determine that the cells

include an equal number of males and females who had an "A" or "B" grade point average with grades of an "A" or a "B" in the teacher's social studies classes. In order to obtain the number of students for each cell, students were sampled from all Mr. Duncan's advanced and average American History classes and all of Mr. Ivan's advanced and average American History classes. From this subject pool, the teachers randomly selected males and females as potential participants, and the investigator asked each potential student participant if he or she wished to participate in the study. Then, I explained to the potential students the procedures for the study. To insure accuracy with quotes, I conducted the interviews via tape recorder. Participants were asked a list of questions (Appendix E and F) and follow-up questions. The interviews took place in a separate room to promote sound quality and confidentially. I also interviewed each of the teachers as part of this study using basically the same procedure with questions tailored for the teachers. Additional follow-up questions were added as the interviews progressed to clarify the students' responses and to help develop insight on how students learn. Three observations were made of each teacher teaching a class to obtain further information on the teachers' method of instruction and to obtain observational information on the students. The interviews with the teachers occurred after all the student interviews had taken place. Then, I had the interview notes transcribed into a word processor, reviewed the notes, and developed conclusions as to the how students learn in their social studies class.

Data analysis Procedures

Open coding is defined as the act of the "researcher examining the text (e.g., transcripts, field notes, documents) for salient categories of information supported by the

text" (Creswell, 1998, p. 150). This process helped the researcher to create categories and to narrow down potential categories (Creswell, p. 151). During the act of open coding, the primary investigator created categories, properties, and dimensionalized properties.

Open coding began with using the constant comparative approach in order to create categories and to saturate the categories. Within the categories, properties were identified. Properties are defined as subcategories that "represent multiple perspectives about the categories" (Creswell, 1998, p. 151). Based on these categories, I created dimensionalized properties. Dimensionalized properties are defined as the presentation of properties in the form of a continuum (Creswell, p. 151). After completing open coding, I engaged in axial coding. Axial coding is defined as the act of identifying one category "as the central phenomenon of interest" (Creswell, p. 151) and beginning to explore the interrelationship among the categories including "the causal conditions that influence the central phenomenon, the strategies [used by the participants] for addressing the phenomenon, the context and intervening conditions that shape the strategies, and the consequences of undertaking the strategies" (Creswell, p. 151).

After classifying information via open and axial coding, the process of interpretation took place. Interpreting is defined as the act of creating a coding paradigm and an optional conditional matrix (Creswell, 1998, p. 151). A coding paradigm is defined as "a theoretical model that visually portrays the interrelationship of these axial coding categories of information" (Creswell, p. 151). A conditional paradigm is defined as "a diagram that helps the researcher visualize the wide range of conditions and consequences related to the central phenomenon" (Creswell, p. 151). The final step of

data analysis involved representing and visualizing. For this step, the researcher presents "a visual model or theory" or presented propositions about the phenomenon (Creswell, p. 148). If the researcher presented a theory, the resulting theory must include the following components: "a central phenomenon, causal conditions, strategies, conditions and context, and consequences" (Creswell, p. 58).

Summary

Chapter three discussed the methodology that was used in the study. This discussion included a description of grounded theory, selection of the sample, data collection (interviews and instrumentation and variables), procedures, and data analysis. Chapter four describes the findings of the study, while chapter five focuses on a discussion of the study's findings.

Chapter 4

Findings

Introduction

The goal of this study was to better understand the strategies that 10th grade students use to learn information in their high school social studies classes. Therefore, four research questions were developed to explore the topic. Through this research, I sought to discover the strategies that the students were using to learn information in the class, the frequency of strategy use, the students' methods for acquiring these strategies, and the impact of the teacher's method of instruction on the students' strategy use. This section discusses the results of the interviews in relation to the research questions.

Student strategy use

The first research question asked the following: What learning strategies, cognitive strategies, and process variables do students use to learn information in social studies classes? To avoid biasing the students' responses, this question was intentionally designed as an open question to promote rich detail during the interviews. However, I was concerned that the students might not be able to answer the research questions. Because the research questions are broad and the students may not be aware of the ways they learned the information in their social studies classroom, the research questions were simplified.

After questioning students about their gender, age, and race, I simplified the research question by asking the student participants, "Can you explain to me how you learn information in your social studies class?" In response to this question, some

students explained their strategy use; other students reacted by describing the way that their teacher teaches them. Fortunately, none of the students answered, "I don't know".

Below are two examples from classes taught by Mr. Duncan in a direct instruction class. The students described the way they learn with an emphasis on how their teacher teaches them. Participant 29 (a white female in an advanced class taught via direct instruction) explained how she learned information in her social studies class. "We usually take notes, and we write them down, and then we just have a discussion, like, while we're going through." Participant 31 (a white female in an average class that uses primarily direct instruction) stated that she learned information in her social studies class "by watching videos and taking notes about what we're talking about at the time."

Also included are two examples of students from the indirect instruction class. They explained how they learn in relation to the way that their teacher teaches them. When asked how she learned information in her social studies class, participant 14 (a white female in an average class that promotes indirect instruction) answered, "We'll have class discussions, we take notes, and read from the book." Likewise, participant 9 (a female of mixed race in an advanced class taught via indirect instruction) noted,

> within the class we take notes, we have discussions where the entire class is discussing or whether it's just a lecture and we're taking notes from that or just listening. Some people don't take notes. It's pretty optional. And then occasionally we'll read from the book, but that's kind of like our last resort kind of thing because there's a lot of stuff that the book will leave out he'll tell us extra. And there are sometimes when we will watch a movie that pertains to the subject but go into detail about between what's real and what the – you know, what's movie magic or whatever.

Understanding the students' perceptions of the class provided insight on the classroom. To gain rich detail, necessary in this type of research study, follow up questions were asked to some of the participants to find out how they learned the class

information and transferred it into their heads. Based on the student responses, additional follow-up questions were added based on Bloom's taxonomy. These questions included the following: Do you use any specific strategies for learning class material? When you learn definitions, do you learn them word for word, or do you phrase them in your own words? When you learn definitions, do you create examples on your own? Do you compare and contrast ideas? Do you think about the ways that the definitions are similar or different? There are two types of information, factual and conceptual. Facts can be dates, vocabulary terms, or statements that the teacher asks you to memorize. Conceptual information can be concepts or ideas. How do you learn facts in your social studies class? How do you learn concepts/ideas in your social studies class?

In reference to Gardner's theory of multiple intelligences, 6 of the 40 students did mention that they had a photographic memory. Photographic memory is a form of automatic processing, defined as the "formation of memories of events and experiences with little or no attention or effort" (Carlson & Buskist, 1997, p. 246). Based on the follow-up questions, students indicated that they did use forms of Bloom's taxonomy. On the initial and the follow up questions, 26 of the 40 student participants indicated that they used a combination of rote learning and elaborative rehearsal. Eleven students said that they only used rote learning, and four students mentioned that they only used elaborative rehearsal to learn material in their social studies class.

For example, participant 36 (a white male in an average class taught primarily via direct instruction) used a combination of rote learning and elaborative rehearsal. He was asked how he learns facts in his social studies class. He replied, "just reading over and over again the same information. Try to make connections to other things I know."

Participant 12 uses primarily elaborative rehearsal. When he takes notes, he said, "I think about it most of the time." He went on to say, "One of the biggest things that I do is I analyze whether it's like a liberal view or a conservative view, whether, you know, basically who the author is, we'll get, you know, where he's coming from or she." He was also asked if he took notes mindlessly or thought about things when his teacher is giving out notes. He commented, "when I'm writing it down, that's mindless. I just write it down and – subconscious basically. I listen and think about what he's [the teacher] saying. And then, when I reread it, I think about it." He went on to say, "Usually I like to listen to what he's saying just because I know what he's looking for that way on the test and such."

The behavior by participant 12 demonstrates moderately high complexity from conceptual systems theory. Moderately high complexity is defined as the ability to combine and use "two alternative systems of interpretation [that] greatly increase the number of alternative resolutions that can be generated" by being "open to a number of alternative pressures" where the person can "observe the effects of his own behavior from several points of view; he can simultaneously weigh the effects of taking different views" (Schroder et al., p. 21).

In contrast to the other student participants, participant 26 (a white female in an advanced class taught via direct instruction) learned primarily via rote learning. When asked how she got the information from the book or lecture into her head, she elucidated, "Whenever we take notes, I just go through it and just memorize stuff and just try to say it out loud and make sure it makes sense." When asked if she had specific strategies for learning class material, she said, "just memorization and writing it down over and over

again and remembering it." Using probing questions, she was asked if she learns definitions word for word or phrase them in her own words, she remarked, "I usually learn them word for word just by whatever it says on the paper, I try to memorize it word for word." Asked if she compares and contrasts ideas, she responded, "No, not really." Asked how she memorizes facts, she remarked, "Um…well, I just read them out loud, and like, say them and then try to not look at the paper and see if I know it and know what it is and what is means and stuff." When queried on how she learned ideas, she said, "Oh, just by – pretty much anything that I do in there I pretty much do just by memorization and just by – I'll write it over and over again."

In terms of gender, males and females used rote learning, elaborative rehearsal, and a combination of rote learning and elaborative rehearsal in almost exactly the same distribution. Students in direct versus indirect instruction classes were distributed in much the same way except for the fact that three students in the indirect instruction class used exclusively elaborative rehearsal compared to only one student who used exclusively elaborative rehearsal in the average class. For average versus advanced students, none of the average students used exclusively elaborative rehearsal. Fourteen of the students used a combination of elaborative and rote learning, and six of the students used exclusively rote learning. While more of the average students used a combination of elaborative and shallow processing, advanced students were more evenly distributed regarding these processes. None of the average students used elaborative rehearsal; however, four students in the advanced class exclusively used elaborative rehearsal. Also, eleven of the advanced students used a combination of elaborative and shallow

processing and while four of the advanced students used exclusively elaborative rehearsal.

I asked both teachers to discuss their advanced and average students. Mr. Duncan (direct instruction) observed,

> I think they're a little different. I think they're more oh…to use one of your words, more conceptual. Uh….I just think they have – I don't want to say they're higher order thinkers. I think there's something that motivates them to be…uh…to be advanced. I don't – you know, I'd have to go look at test scores; but I don't know that their test scores would be as drastically higher than anybody else's. I think, in some cases – you know, I've got a couple kids in here, in my classes, that have never [emphasis] been in advanced classes, but you can tell they're higher order thinkers than some of the other ones. They're more thinking independent. So, being – I don't think being in an advanced class makes them, you know, a whole lot different. I just think it's maybe a motivation standpoint.

Mr. Ivan (indirect instruction) discussed the differences between his average versus his advanced students.

> I think my advanced students care more. The motivation's there. Like I told my class today. You know, whether they're an advanced student or regular student, it really boils down to motivation and the ability that you want to learn. And if you want it in your heart, you want to study, and you want to take the harder classes and be more in depth, then you can elect to do that. Honestly, between my two classes, the difference between my regular and advanced, my regular kids are less motivated. It's hard to motivate somebody that doesn't want to be here at times. You hear in college all these wonderful ways to motivate students, and I tend to chuckle inside because people who tell me that haven't taught in a classroom for 20 years. So, I call it out of touch with reality. So, I think a lot of it boils down to motivation and, you know, what their past experience has been in history or any advanced class. If you've always struggled in history, then you're not going to take an advanced course or you will not make it because the difference is night and day between the two curriculums.

I also asked the teachers how they thought that their students learned information in their social studies class. Mr. Duncan replied,

> Um…I think most – well, I think in different ways. I think the major way they learn is through auditory learning,….uh…some rote memorization. Uh….I think…uh… that they also learn through group learning that we do. We do – after we get through the first two units and in the third, fourth, and fifth units we do

> quite a bit of group work. Uh...Uh...I think they, through critical thinking exercises they learn quite a bit. But, I would say the majority of it is through ...uh...auditory. It is somewhat of a lecture based class.

Other explanations allude to lack of awareness of the value of being able to learn information in different ways.

Mr. Ivan remarked,

> I think that they learn both through direct instruction and indirect instruction. For example, direct instruction, a lecture/discussion format. I use that quite often... probably out of every unit, probably at least four or five times. And their indirect instruction in essays or concept lessons, I have them investigate, they'll do games and simulations, or they'll work from the book developing problems and answers to how they would solve the problems. And, that's historically been my advanced classes. My regular classes tend to be the learning styles to be a little bit more concrete. They, like, naturally perform better, in my opinion, with more of a direct instruction approach because it's simply logistics and uh...behavior problems possibly happening when you have indirect instruct instruction because the more freedom sometimes you give them – you notice I word "sometimes." I'm not going to stereotype them. But, they tend to take advantage of the situation, unlike some other classes that would be more directed and focused.

When asked if he thought that the students create examples, Mr. Duncan stated, "Some do. I would say, for the most part, no, but some do." He also noted, "I think that, for the most part, as kids mature your ability to learn changes because I know that my ability, like I have said two or three times, has changed the way that I learn." When Mr. Ivan was asked the same question, he replied,

> Yes, they do. There are many projects that I ask them to do. I think they will create examples on their own. On an essay question, I asked them to pretend that they were a different person. I ask the advanced kids to do it, but with the regular kids, it is pushing it.

When asked if students compared and contrasted definitions, Mr. Duncan explained, "Well, as a teacher, you present situations that allow for that, yeah, they will compare and contrast." He went on to say, "Uh...I do some of that in class; and I think,

yeah, kids do that. But I don't think they create those comparisons and contrasts on their own. I think you have to create it for them." Later in the interview he says, "if you present them in a manner that they have to compare and contrast, yeah; and if you don't, no." When asked if students compare and contrast, Mr. Ivan said, "I would hope they are. I can't speak for them. You know, I'm not a student, but I'd hope they would be."

When asked if he thought that students rephrased definitions in their own words, Mr. Duncan stated,

> I think they learn – what I think that I've seen them doing is they learn the first three or four words of a definition, uh…which changes my strategy in how they learn definitions. I picked up on this in my first couple years of teaching with them. And we do vocabulary in here also, but we were doing vocabulary terms. And I noticed kids would have the first three or four words for the definition when we were doing matching. So, what I have had to do is change and have them write the definitions, or I give the definition, and they have to write the word. Uh…or we'll do, you know, verbal. Okay. Tell me what the definition of this is. The kids will find, inevitably find the easy way around. I think it's just human nature for us to find a better, easier way to do things.

When asked if students rephrased definitions in their own words, Mr. Ivan explained,

> Like I said before, it depends. Some people use flash cards. Some people use almost like mnemonics. Some people use – I mean it is amazes me the different ways – some kids…once. They'll look at it and say, I know it. You have instant learners like that. Those are a diamond in the rough.

In terms of student motivation, students indicated that they tended to use techniques such as rephrasing definitions or comparison/contrast when they had trouble understanding the term or when doing so made it easier for them to understand. I asked participant 21 (a white female in an advanced direct instruction classroom) if she created examples of definitions on her own, she observed, "Depends. If it's really hard, then I'll create examples. Like, but if it's something that I can usually remember, then it's you

know…[not create examples]." When I probed her response to see if she learns definitions word for word or if she phrases them in her own words, she said, "I phrase them differently. Because sometimes word for word is too long, and it just doesn't make sense, so I just try to get them to where they're easier."

Other students would only use comparison and contrast if the teacher required him to do so. Participant 18 (a Native American male in an advanced class taught via indirect instruction) notes, "if it's not instructed for us, you know, I don't like to do anything extra, so if he tells us to do it, then I'll do it." Likewise, participant 25 (a white male in an advanced class taught via direct instruction) when asked if he will compare and contrast ideas, he commented, "Not own my own. If I am assigned to do it, I will."

In short, most students used a combination of elaborative rehearsal and rote learning to learn information in their social studies classes. Some students used elaborative rehearsal to help with difficult terms to make them easier to understand, and some students used rote learning because it was an easy and effective method that would allow them to pass the exam. This supports the premise of process variables, i.e. students adapting their strategy usage to meet their needs as a learner (Anderson & Armbruster, 1984, p. 657). This may suggest that in order to get some students to use higher level thinking skills, teachers need to have these higher level thinking questions on their exams.

Frequency of strategy use.

Related to the strategies that students use to learn information is the following question: How often do students use these strategies? Of the 40 students, 12 students used these strategies all the time, 1 student used strategies most of the time, 15 students

used the strategies only before a test, and 2 students used strategies only when they took notes in class. Nine students had no response to this question.

In general, students tended to use these strategies before a test or all/most the time. An explanation for why students used the strategies before a test may be that they used the strategies when they saw a need, such as passing a test or helping the student learn the class material.

Participant 21 and 37 are two examples of students who use these strategies to help themselves learn in situations such as passing a test. Participant 21 (a white female in an advanced direct instruction class) learned primarily through rote learning, and she used rote learning "Mostly… the night before. Ha…ha…I cram the night before because I don't remember stuff, like, over a long period of time, so I usually do it, like, right before so it's fresh." Participant 37 (a white male in an average social studies class taught via direct instruction) said he learned by "reviewing them [the information] over and over and just kind of reading them and saying them back to myself." When he learns facts, he says, "I try to associate with things that I'm interested in. If I'm not already interested in it." He stated that he uses these strategies, "usually only when I have a test coming up."

Comments by participant 38 (a white male in an average class taught primarily via direct instruction) offer an explanation on why other students used strategies most or all. He learns primarily from the teacher's lecture and taking notes in class. He explained that he acquired this approach because, "when you have a teacher that has you take notes every day; I got used to it." For him, learning via lecture and notes was something that occurred often in his social studies class.

Although the study involves small sample sizes, there were differences among average versus advanced students. Of the students who used the strategies only before a test, average students made this comment twice as much as advanced students. However, students who said that they used their learning strategies all the time, advanced students made this comment twice as much as average students. Direct and indirect instruction students tended to mention the same comments with fairly equal frequency.

In short, students tended to use strategies when they saw a need, such as preparing for an exam or all the time, by default when the student's learning style matched the teachers' method of instruction. Differences occurred among average and advanced students, but not among in terms of direct versus indirect instruction.

Strategy acquisition.

Related to the questions on strategy use and frequency is the acquisition of learning strategies. Understanding how students form learning strategies can provide insight on the ways that students approach learning. Therefore, the third research question asked the following: How do students acquire these strategies?

I asked Mr. Duncan, how he thought that the students acquired their learning strategies. Mr. Duncan teaches primarily using direct instruction. Mr. Duncan elucidated,

> Well, I think a lot of that deals with uh…their mental makeup. I mean, naturally I was always told that you teach how you were taught. So, I think, a lot of kids learn how they were taught…. But, I think a lot of it is developed over time and how they learn prior….I notice when I taught the American Government class in [name of a different city], I had seen – and I didn't – I didn't have to teach – I don't want to say hard, but the seniors had been through so much of the different styles of teaching they picked things up quicker. And, well, I had a freshman class here in my first year, and it was like pulling teeth because you could tell that they had been spoon fed everything. Everything that I see is my child in sixth, seventh, and eighth grades in the middle school. And it's more spoon fed….

> there, you know, here's the information. You know… You're given a sheet and there's the information on it, you know. Okay?…. And, I think they transition out of that into high school. Not necessarily that we teach different here than in middle schools, but I just think that we teach to the maturity level, and I think to maturity, to make a long answer short, maturity level has a lot to do with it. Uh…how kids learn.

I also asked Mr. Ivan how he thought that his students acquired the strategies that they needed to learn information. Mr. Ivan responded,

> I think a lot of them learned it through the school of hard knocks, to be honest, trial and error. I'm not trying to slam the middle schools, but they are not preparing these students for high school. They're getting their butts handed to them on a platter when they come here because they're used to the middle school, everything being, Oh, here is a worksheet, here's this, here's that, and it's very babied. Now, I understand why they do that because obviously the age differential and the differences in the age. But, when they get into an advanced class such as the one I teach, you know, we move. And a lot of it's through trial and error. Usually the first tests and the first couple grades will be the lowest they'll ever have because they don't know my style, they don't know what I expect. Honestly, when all is said and done, I think they have the idea of taking notes vaguely when they're freshmen. Their sophomore year – when they get into an advanced course or in any kind of class where the teacher emphasizes different learning styles, you have to – really force yourself to adapt to those changes. If you don't, then, you know, that's your Achilles tendon, that's your weakest link. And that's why, when I teach, I try to do different learning styles somewhere [said with emphasis] in that unit or something different in there so that one kid can grasp that kind of concept.

I also asked the students how they acquired their strategies for learning information. In terms of strategy acquisition, the student comments revealed several trends. Students tended to do one of the following: ask a family member or friend for potential learning strategies, imitate the strategies of a teacher or family member, or use trial and error. The most common method of acquiring strategies was to imitate the strategies of a teacher or family member. There were no major differences between advanced versus average students in their method of acquiring their learning strategies.

Likewise, there were no major differences between students in direct instruction and indirect instruction in their method of acquiring learning strategies.

These results can be explained in terms of behavioral theory. Imitating a teacher or friend is an example of the behavioral term, imitation. Imitation is defined as "acquisition of knowledge and behavior by watching other people act and then doing the same thing ourselves" (Worchel & Shebilske, 1992, p. 497). Using imitation to learn information is known as observational learning. Observation is defined as "learning by watching other people and observing the consequences of their actions. This type of learning occurs without external reinforcement or without even performing the behavior" (Worchel & Shebilske, p. 497). Although external reinforcement is not required, imitation is most likely when the individual sees that the behavior has reinforcing consequences (Worchel & Shebilske, p. 497; Zimbardo & Gerrig, 1999, p. 263). An example of observational learning can best be explained by the comments made by participant 13. Participant 13 (a white female in an average class taught via indirect instruction) explained to me how she learned to use her strategies.

> Actually, I just started using note cards last semester. I really don't – I don't know why. I think it was actually, like, a social studies test, and I really needed to get it in my brain. Like, I used to just not study, you know. And at the end of the semester I was trying to pull my grade up, so I was running through the ways I could study; and, you know, note cards just seemed to work the best. I used them, like, teachers used them in grade school, like birds and stuff. So, I figured,... well, I'd try it,... and it really works. So, now, that's like how I do it.

Bandura did not consider observational learning to be entirely separated from classical and operant conditioning (Weiten, 1998, p. 247). Operant conditioning is defined as "a form of learning in which behavior is affected by its consequences. Favorable consequences strengthen the behavior and unfavorable consequences weaken

the behavior" (Carlson & Buskist, 1997, p.134). Using trial and error or asking a family member / friend for potential strategies or using techniques taught to them by others such as teachers relate to operant conditioning.

When the students faced a quiz or exam, they needed to find a way to respond. The results of this study showed that student tended to do one of the following: ask a family member or friend for ideas or create a strategy on their own. If the student's chosen approach worked, then this experience strengthened the likelihood that the student would use the approach in the future. If the approach was not successful, then the student might test a different approach as part of trail and error.

Some students did not need to engage in much trial and error and find strategies quickly. An example of this is participant 28 (a white female in an advanced direct instruction classroom) who stated, "I just kind of did what I did – I don't know. I learn better from, like rereading things. I kind of get them into my head better than, rather than just having somebody tell me what they are and trying to remember from that."

Other students evaluated strategy usage over a longer period of time. Participant 7 (a white male in an advanced class taught via indirect instruction) expressed that he learned through "just trial and error because eventually – you just kind of eventually see what's best for you." Participant 25 (a white male from an advanced direct instruction class) explained that he learned "through experience…um…trying to learn the best way…thinking about the best way to learn…and that was just easiest for me." Participant 12 (a male of mixed race in an advanced indirect instruction class) said, "just kind of working it out, you know, figuring out what works, what – I don't know – what will give me the better grade in his [the teacher's] class…you know." Participant 40 (a

white female in an average direct instruction classroom) described her approach to learning information. She gave details. "I tried all kinds of other ways of learning stuff that people told me. Then, my Mom suggested that I try repeating, that repetition was the best way, and I tried that, and it worked." She went on to say, "I got the basic idea from my Mom and then perfected it. Not perfected it because it's not perfect, but, you know, worked on it so it works for me." She still used rote learning but she also searched for other strategies to learn facts or concepts that she studied in class.

Participant 37 (a white male from an advanced class taught via direct instruction), when asked how he acquired his approach to learning information said, "I think that's probably the easiest – I mean, that's the most common way to learn. That's always what I have been taught to do …that if I don't understand something, then repetition will make you remember."

One thread that binds together the students who engaged in longer amounts of trial and error is that they were engaging in metacognition, the act of thinking about thinking (Nisbet & Shucksmith, 1986, p. 30). They use process variables, focusing on using strategy to maximize the learning and retrieval of information to meet their personal goals (Anderson & Armbruster, 1984, 657), and self-regulation, the use of active participation in the student's own learning process in terms of their metacognition, motivation, and behavior (Zimmerman & Pons, 1986, p. 284).

In summary, this research questions asked how students acquired their strategies for learning information in their social studies class. Common responses among the student participants were to ask a family member or friend for potential learning strategies, imitate the strategies of a teacher or family member, or use trial and error. The

most common approach among the students was to imitate the strategies of a teacher or family member. The students' acquisition of strategies can be understood in terms of observational learning and operant conditioning.

The teacher's method of instruction and student strategy use.

The fourth question focused on the teacher's instructional style and asked the following: Does the teacher's methods of instruction have any impact on the students' use of learning strategies, cognitive strategies, and process variables? This question looked at the potential impact of direct instruction versus indirect instruction on the ways that students learn in their social studies class. This question was intentionally designed to be open ended so as not to bias the student and teacher responses, and the student and teacher participants interpreted the question in different ways.

I asked the teachers if they thought that their teaching style had any effect on their students learning strategies, cognitive strategies, or learning methods. Mr. Duncan answered, "Oh, definitely. I think so, yes. I mean, they can't approach – they can't approach when I lecture in the same manner that we do…in cooperative learning. There's just no way." In response to the follow up question, "Do you think that your students change the way that they lean in order to adapt to your class?", Mr. Duncan replied,

> I think more probably me adapting as we go along and I see test scores, and I see, you know - I like the kids to give opinions and as I read opinions, you know, as and as we do an essay test, I like to see how they write, and then I know how they're processing information. So, I think it's probably a little bit of them adapting to me, and me adapting to them.

Mr. Ivan had the following reply.

> I would have to say yes to a certain extent because I am influencing and altering their learning strategies by simply having the test. The test itself is a condition,

> and they have to adapt to that. So, inadvertently or advertently, yes, I am influencing their learning styles. How? Well, I haven't interviewed every student. But like I said before, they tend to adapt after they realize what they need to do to pass the test or whatever objective they want to have.

In response to the follow up question, "Do you think that your students change the way that they lean in order to adapt to your class?", Mr. Ivan replied,

> Yes. You have to. You sink or you swim. I mean it's that simple. Uh…and the goals and expectations are there. Now, if a student has a learning disability or a student doesn't grasp the material, then I will go out of my way to, as long as they approach me. When they meet me half way, then I'll go out of my way to try to help them try to form strategies and talk about the material if they don't understand it. But a lot of it – you know, I put the pressure on them. Because they're young adults and the need to learn.

In terms of student responses, 6 of the 40 student participants specifically mentioned that they adapted their approach to their teacher's method of instruction. For instance, participant 8 (a white female in an advanced social studies class taught via indirect instruction) explained,

> after you get the first test, you kind of learn what questions and what things he wanted to know out of what our thing was. And so, whenever you're studying for things, you just look at, and like, is that really important in what we're trying to do? And if it's not, then you can know it, but you don't have to spend too much time on it if you don't want to.

She went on to say, "it's probably that for most teachers."

While three of the participants used a more active approach to adapting, two of the participants took a more passive approach to adapting. For example, participant 34 (a white male in an average social studies class that is taught by direct instruction) answered that "they [the teachers] teach the way that they think is right, and I – I learn whatever they have." Likewise, participant 27 (a white male in an advanced social studies class taught by direct instruction) noted the following: "every teacher has their own little thing

they do, and – I don't know – you just cope with whatever they do. You just go along with it. It doesn't really affect the way that I learn my information and stuff." In this case, the student is demonstrating interpersonal intelligence from Gardner's theory of multiple intelligences. Interpersonal intelligence is defined as "capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people" (Gardner & Hatch, 1989, p.6) when they tried to adapt their learning to meet the teaching style of the teacher.

Overall, the majority of the students reacted to this question by describing class activities that helped or hindered their ability to learn class material in their social studies class. Among the participants, the following activities aided their ability to learn: lecture, class notes, and class discussions. The frequency of the responses was fairly evenly distributed in the direct instruction and indirect instruction groups. These responses were fairly evenly distributed in the advanced students (including both direct and indirect instruction) and average students (including both direct and indirect instruction).

Lecture.

In the indirect instruction class, participant 19 (a white male in an average social studies class taught via indirect instruction) remarked that the teacher helps "when he [Mr. Ivan] speaks and stuff. He's a really good speaker. What he speaks sticks in your head." He goes on to say that the teacher "gets you interested....like the way he [the teacher] talks about it. He puts in a lot of detail and stuff...and he has personal stories."

In the direct instruction class, participant 23 (a white male in an advanced class) observed that the lectures helped him because, "it's all verbal instead of written down, and he [the teacher] tells it – he basically says it the way that it's out of the book

sometimes, but other ways. It's just easier to learn that way." Participant 34 (a white male from an average class that emphasized direct instruction) stated, "I think...uh...the lectures, that you learn it from – they'll actually explain it to you, and you can listen. They'll answer questions that you don't really – you wouldn't really get from the book."

Class notes.

Some students enjoyed having notes for varied reasons. Participant 22 (a white male in an advanced classroom that emphasizes direct instruction) explained that notes helped him because, "you can go back over your notes and still have all the information there." This could prove useful when preparing for an exam. Another student used notes to promote elaborative rehearsal. Participant 10 (a white male in an advanced class that stresses indirect instruction) responded, "I really like taking notes. I enjoy that." He went on to say, "Notes are – when you are writing it down, you have to think about what you're writing down. I do anyway. That's a good way to learn, I think...writing stuff." Meanwhile, another student emphasized the value of viewing information in different ways. Participant 20 (a white male in an average class that uses indirect instruction) talked about his teacher. "You know, it's easier for everybody to learn the way he teaches. Most of the time, he gives us, like, a visual or, notes on the board or, you know, like maps. Anything that's, you know, visual. It helps you learn better because you get a visual of what everything is, you know, instead of, you know, just hearing it sometimes and then reading it out of the book. It's all different."

Class discussion.

Class discussion also helped students to remember information. As a follow up question, I asked participant 9 (a female of mixed race in an advanced social studies class

that uses indirect instruction) if having the teacher using a lecture approach helped her, and she replied, "If we're allowed to ask questions. If he's just telling us, I can remember it. But, if we talk and we add in and everything, that helps because I can remember things like that. But, if it's just one person telling us, and we're supposed to know it, it's kind of, like, it's hard for me to remember what they said." Participant 10 (a white male in an advanced class with indirect instruction) enjoyed that fact that the teacher taught students to analyze information from different perspectives. He explained that the teacher will "bring up a point, and you're like, oh, yeah. Well, that must be right. Then, he brings up the opposite point in opposition, and you're like, oh, year. Well, - you're not sure what to think." One potential reason why the class discussions made the information easier to learn is that they can promote elaborative rehearsal.

Participant 10's comment on the teacher playing devil's advocate refers to Mr. Ivan's use of encouraging his students to use of the moderately high level of complexity of conceptual systems theory. Moderately high complexity is defined as the ability to combine and use "two alternative systems of interpretation greatly increase the number of alternative resolutions that can be generated" by being "open to a number of alternative pressures" where the person can "observe the effects of his own behavior from several points of view; he can simultaneously weigh the effects of taking different views" (Schroder, Driver, & Streufert, 1967, p. 21).

The activities that detracted the students' ability to learn class material were more varied and included the following: text, bookwork, book with detail, details in lecture, documentaries, auditory learning, mindlessly copying notes, group work, and lecture with no class interaction. Clearly, some of the activities such as lectures were described by

some students as beneficial yet non-beneficial by other students for learning information in their social studies class. Participants provided two explanations for this incongruity in their interviews. These explanations involve multiple intelligences and interactivity.

Howard Gardner suggested that individuals have different types of intelligence, and the results of this research questions show that some of the student participants had an awareness of whether they are an auditory, visual, or kinesthetic learner. Students also displayed intrapersonal intelligence, defined as "access to one's own feelings and the ability to discriminate among them and draw upon them to guide behavior; knowledge of one's own strengths, weaknesses, desires, and intelligences" (Gardner & Hatch, 1989, p.6), when they noted that visual, auditory, or kinesthetic ways of learning helped or hindered their ability to learn information. I asked participant 33 (a white female in an average social studies class that is taught primarily through direct instruction) the following follow-up question: "The lecture method, using lecturing, does that help you learn?" She remarked "Yeah, I think so because I'm an auditory learner, and so hearing it as opposed to just reading it just makes a lot more sense to me."

Some of the students also mentioned both auditory/visual learning and the role that verbal interaction played in their ability to learn information in their social studies class. In response to the research question, participant 14 (a white female who is a student in an average social studies class taught primarily through indirect instruction) said, "Yeah. I think his [the teacher's] class especially, they [methods of instruction] have a better effect because I learn – I learn – like, personally I learn better, like verbally. And so…the class discussion, it makes it stay in your head if you're arguing or just kind of debate." Participant 40 (a white female in an average social studies class taught by

direct instruction) said, "I'm not a listening person. I am more of a seeing and writing down person. If I hear it, it doesn't – it's like in one ear and out the other. If I can see it, then I'm ten times better off. So him [the teacher] writing it down helps a lot, but lecturing is just – blows my mind."

Some of the students showed a preference for an interactive activity such as class discussion over activities typically associated with direct instruction bookwork, non-interactive lectures, or copying notes from the board. For example, participant 7 (a white male in an advanced social studies class taught using indirect instruction) commented, "I like hearing people talk. That helps a lot. Usually when you like, kind of more of a dialogue, like, kind of talking back and forth like that. I like that more than just doing textbook work because you have something to interact with."

Participant 29 (a white female in an advanced class that uses direct instruction) explained that "usually whenever we take notes and explain something, then I understand that more than having just bookwork. Because usually, with bookwork, I don't read it all, and I just want to get to, like, answering the questions; and so, I just know the answers to those questions as opposed to having to read the whole thing."

I asked the following follow-up question. "Does the lecture method – when someone lectures to you in class, does that help you learn?" Participant 32 (a white male in an average social studies class taught via direct instruction) commented, "I'm better at taking notes and learning that way. Lecturing is not my best way of learning." He goes on to say, "I have to be busy. I can't just sit and watch and listen to someone talking. It doesn't all go into my head and stay."

Participant 25 (a white male in an advanced social studies class that is taught using direct instruction) was asked about the effect of the teacher's method of instruction. He responded, "If the teacher decides to have a conversation or a group discussion about what we are talking about, it is easier to remember...but if it's just notes that we are copying, it's just more difficult." When the primary investigator asked him to clarify, he explained, "because if I participate in a conversation about a certain topic, and we are spending more time on it. It helps me to remember. But if we are just copying it, then it's kind of mindless."

One possible reason for the students' lack of interest in bookwork, non-interactive lectures, or copying notes is motivation and skills. These activities can promote elaborative rehearsal, but the student needs to use these teaching methods as a means for thinking about the class material. The student needs to know about strategies such as analysis, comparison/contrast, creating examples, and rephrasing definitions in their own words and the students must be motivated to use these strategies.

Some students lacked the ability to adapt to other methods of instruction such as a non-interactive lecture. Participant 4 (a white male in an advanced social studies class taught by indirect instruction) stated, "[The teacher] he gives more information speaking than he does on his notes. I have a hard time remembering verbal conversations I may have with some people, and I just have to – I usually write down what he's saying almost word for word, just trying to write it down so I can remember what he said." He went on to say, "lectures, I don't know. I mean, it just – I don't know how I'm going to get through college, but hand to hand work with the teacher personally."

Participant 28 (a female in and advanced class that uses direct instruction) elaborated further on the issue of adapting to the teacher's style of presentation. She stated, "I kind of like the short outline that he [the teacher] gives for notes, but – because if I was just going to take notes on – if they were just going to stand up in front of the class and lecture forever, I'm not very good at knowing exactly what to write down and stuff." She went on to say, "I was saying that if the teacher just stood in front of the class and lectured, it would be hard for me to figure out exactly what we needed to write down as far as taking helpful notes. So, I prefer the kind of outline that they give us on the board." Her reaction to the lecture approach overall was that "it's kind of harder to pay attention then because, they're just kind of talking and – I don't know. It's harder to follow and stay awake in class."

Not being able to create outlines or pay attention if the teacher does not use a verbally interactive approach, can limit the student's ability to learn information compared to students who can adapt to non-interactive lectures. The fact that some students cannot adapt to a non-interactive lecture could pose a definite problem for some of them when they encounter large college classes taught in a lecture format with little student interaction.

In terms of the effect of the method of instruction (direct versus indirect instruction), the results showed interesting trends. Few students consciously adapted their method of learning to fit the teacher, although the teachers explained that they adapted the way that they teach to match the students. While the activities that helped the students learn information included notes, lectures, and class discussion, the activities that hindered the students' ability to learn information were more varied. The overlap

between the activities that aided and hindered the students could be explained through Howard Gardner's theory of multiple intelligence and interactivity. Some of the students were aware of their learning style (linguistic or spatial) that supported the premise of Howard Gardner's theory of multiple intelligences. Other students enjoyed the interaction that came with class discussion over passive forms of learning such as mindlessly copying notes. Problems occurred with students who did not know how to adapt to other methods of teaching such as non-interactive lecture.

Summary

In short, research question four examined the impact of a direct or indirect instruction approach on the students' strategy use. Students noted that lecture, lecture notes, and class discussions aided their ability to learn class information. Activities that hindered the students' learning were more varied and include the following: text, bookwork, book with detail, details in lecture, documentaries, auditory learning, mindlessly copying notes, group work, and lecture with no class interaction. The listing of lecture as both beneficial and harmful to learning could be explained through multiple intelligences and a need for interactivity. Not being able to learn in different modes such as verbal or visual can limit the students' ability to learn information.

Chapter 5

Conclusions

Introduction

For some students, learning is easy, and for other students who have ineffective strategies, learning can be a challenge (Weinstein, Zimmerman, & Palmer 1988, p. 36). This study focused on students with an "A" or "B" grade point average in their social studies class. I attempted to understand the strategies that students in this study used to retain information learned from lectures, interactive learning activities, or reading the text. The results of the study may provide valuable information for students who exhibit little or no learning strategies for understanding material in their social studies class. As a byproduct from the information learned, social studies teachers could aid students who lack learning strategies.

The act of learning is based on a theoretical foundation of automatic and effortful processing (Illustration 1). Two forms of effortful processing are maintenance rehearsal and elaborative rehearsal. Maintenance rehearsal, also known as rote learning, is defined as "the rote repetition of information; repeating a given item over and over again" (Carlson & Buskist, 1997, p.244). In contrast, elaborative rehearsal is defined as the "processing information on a meaningful level, such as forming associations that relate the new material to information that the person already knows, thinking about the meaning of the material" and thinking about the information (Carlson & Buskist, p. 244).

Based on these forms of processing are learning strategies, cognitive strategies, and process variables. Also based on these forms of processing are models such as Bloom's taxonomy (Bloom, et al., 1956), conceptual systems theory (Harvey et al., 1961;

Schroder et al., 1967), Discovery and Expository approaches to learning (Martorella, 2001, p. 200), and Howard Gardner's theory of multiple intelligences (Gardner & Hatch, 1989).

Researchers have also sought to understand students' usage of learning and cognitive strategies (Ablarrd & Lipschultz, 1998; Wolters & Pintrich, 2001; Zimmerman & Martinez-Pons, 1990) by studying self-regulation. Zimmerman & Pons (1986) conducted a literature review to locate behaviors used by students to learn class material. The authors correlated these behaviors with student grades and used this information on student behaviors to create a list of behaviors for the Self-Regulated Learning Interview Schedule (SRLIS). Yet, Ablard and Lipschultz used the SRLIS in their study and found that some students used strategies from the SRLIS while some students used other strategies not listed on the SRLIS. Finally, some students did not use self-regulated learning strategies at all.

The work of Ablard and Lipschultz (1998) suggested that students might be using additional strategies not listed in the SRLIS. Therefore, this dissertation sought to refocus the work of Zimmerman & Pons (1986) to locate additional strategies for learning information by using interviews that could provide rich detail on students' thoughts related to learning strategies. Also, unlike the work of Zimmerman & Pons, this dissertation focused specifically on strategies used in social studies classes. One reason for focusing specifically on social studies classes was to learn more about the learning strategies that are useful for that particular subject area. Due to the unique nature of each subject matter area taught in a high school, students may use different strategies for each content area. Students could potentially use learning strategies related to Bloom's

taxonomy (Bloom, et al., 1956), conceptual systems theory (Harvey et al., 1961; Schroder et al., 1967), Discovery and Expository approaches to learning (Martorella, 2001, p. 200), and Howard Gardner's theory of multiple intelligences (Gardner & Hatch, 1989) in other subject areas. However, different subject areas could emphasize learning strategies in different ways. For example, in a woodshop class, a student might potentially need to focus more on working with concrete ideas than abstract ideas, using more hand eye coordination (bodily-kinesthetic intelligence) in cutting the wood, and exhibit more spatial intelligence in assembling the pieces of wood compared to students social studies classes.

Research questions

The first research question asked the following: What cognitive strategies do students use to learn information in social studies classes? The results of the first research question indicated that most students used a combination of shallow and deep processing to learn information in their social studies classes. Although they did not know the terms in Bloom's taxonomy (Bloom, et al., 1956), the students indicated that they used the skills generally associated with Bloom's taxonomy to help them learn and understand information.

In reference to motivation, some students indicated that they used deep processing to help with understanding difficult terms. While some students used shallow processing because it was an easy and effective method that would allow them to pass an exam. This action supports the premise of process variables, defined as the act of students adapting their strategy usage to meet their needs as a learner (Anderson & Armbruster, 1984, p. 657). These results suggest that in order to get some students to use higher level

thinking skills, teachers need to require students to display higher level thinking on their class work and on their exams.

The second research objective asked the following question. How often do students use these strategies? The results indicated that students tended to use strategies when they saw a need, such as preparing for an exam or all the time for learning class material. This suggests that students used learning strategies in a utilitarian manner, and thus, teachers might approach the teaching of learning strategies with this in mind.

The third research goal focused on the following: How do students acquire these strategies? Common responses by the students were to ask a family member or friend for potential learning strategies, imitate the strategies of a teacher or family member, or use trial and error. The most common approach used by the students was to imitate the strategies of a teacher or family member. These strategies can be understood via observational learning and operant conditioning. Only two of the students mentioned that they had received instruction in strategies for learning class material and the rest of the student participants tended to acquire learning strategies in a haphazard manner. This leads me to believe that students would benefit from formal instruction on learning strategies.

The fourth research question asked if the teacher's methods of instruction had any impact on the cognitive strategies that the students use? Interviews with the students indicated that lectures, class notes, and class discussions aided them in learning class information. Activities that hampered the students' approach to learning were more varied. These included the text, bookwork, reading textbooks with detail, listening to lectures with details, watching documentaries, auditory learning, mindlessly copying

notes, and unstructured group work. Lecture was viewed as both beneficial and harmful to learning. Gardner's theory of multiple intelligences and the need by some students for interactivity during lectures provided an explanation the positive and negative responses to lecture by the teacher. Students did not use terms such as spatial or linguistic intelligence from Howard Gardner's theory of multiple intelligences (Gardner & Hatch, 1989); however, in their own words, some students explained how they used vision or hearing to learn information. These comments suggest that some forms of spatial or linguistic intelligence was being used. Students displayed intrapersonal intelligence, defined as "access to one's own feelings and the ability to discriminate among them and draw upon them to guide behavior; knowledge of one's own strengths, weaknesses, desires, and intelligences" (Gardner & Hatch, p. 6), when they noted that visual, auditory, or kinesthetic ways of learning helped or hindered their ability to learn information. Although students might be proficient in one form of intelligence such as linguistic intelligence, lacking other forms of intelligence such as visual intelligence, i.e. the ability to remember information the student reads from a textbook, could limit the students' performance in the social studies classroom. This is because much of social studies instruction relies on gathering information from written sources. Likewise, when the majority of teachers still rely on lecture as the primary mode of instruction, students who are weak in linguistic intelligence can have difficulty understanding and retaining the information that is being presented. Both teachers in this study tried to accommodate different learning modalities (visual and verbal). Students could benefit from instruction on how to develop their intelligences and could benefit from using that instruction to improve their areas of weakness such as linguistic or visual intelligence. This could also

aid the students outside of the classroom where jobs often require expertise in multiple intelligences.

A theory on learning information in social studies classrooms.

Student learning is a complex issue. Biggs (1984) developed a theoretical model that described student learning in terms of strategies and motivation. Biggs suggested that students learned using three strategies: learning the bare minimum of information using rote repetition, learning for knowledge, or behaving like an ideal student who does not procrastinate and follows the teacher's instructions. While Biggs portrays distinct categories, Biggs does not address students who use shallow or deep processing based on whichever is better suited for learning the class information. In contrast, self-regulated learning is defined as students who use active participation in their own learning process in terms of their metacognition, motivation, and behavior (Zimmerman & Pons, 1986, p. 284). Zimmerman and Pons (1986) developed the SRLIS to measure self-regulation and lists "organizing and transforming" and "reviewing notes/reviewing text" (Zimmerman & Pons, p. 622 - 623) as self regulated learning categories on their measurement instrument. The results of this study supported Zimmerman and Pons work and suggested that students did use shallow and/or deep processing. However, the behavior of students in this study suggests that cognitive strategy use can be explained in a broader structure of knowledge, necessity, and motivation.

The central phenomenon for this study sought to understand the ways that tenth grade students learned information in their social studies class. Based on this central phenomenon, three causal conditions provide insight on student strategy use. This study suggests that use of cognitive strategies is promoted when students have knowledge about

cognitive strategies that promote shallow and deep processing, students perceive a need to use these strategies, and students are motivated to use these strategies to learn class information.

Knowledge of cognitive strategies is important because not all students know how to learn (McKeachie, 1988, p. 5; Weiten, 1998, p. 29), not all students are taught how to learn (McKeachie, p. 5; Weiten, p. 29), and some students approach learning using poor strategies (Blackerby, 1996, p. 9; Nisbet & Schucksmith, 1986, p. 8; Weiten, p. 29). In this study, only two of the students mentioned that their teacher had taught them higher level thinking skills. While some students were thoughtful and systematic in their approach to gaining strategies for learning material, most students seemed to gain higher level thinking skills fortuitously. Some students picked it up via trial and error. Other students mimicked their teacher or had a parent who had knowledge and awareness that they could pass on to their children about deep processing strategies. With students learning higher level thinking in a haphazard manner, teachers cannot expect all of their students to enter the classroom with higher level thinking skills. The fact that many students' search led them to rote learning suggests a need to teach students how to use higher-level thinking in a systematic and age appropriate manner.

In this study, the teachers demonstrated strategies for higher level thinking in classroom. One teacher used devil's advocate, asking students to consider information from a different perspective, and comparing and contrasting government systems. However, the teachers did not provide systematic instruction on the use and relevance of cognitive strategies that promote shallow and deep processing. While using higher level thinking skills can require more mental effort than mindlessly repeating information over

and over in one's head, and there are some situations in which shallow processing is more appropriate and other situations in which deep processing is more appropriate. Helping students to understand the situations in which shallow or deep processing is useful and can aid students in the learning process. While some students embraced cognitive strategies that promoted deep processing, most students did not internalize higher level thinking strategies and only used them when required by the teacher or when they were having trouble understanding information in the class. A preference for shallow processing (rote learning) suggests that use of deep processing is based on a utilitarian need to understand the class information or to pass an exam. Therefore, the teachers may need to require their students to demonstrate higher level thinking skills on class work and on exams at a level appropriate to the students' level of cognitive development.

While teachers can encourage their students, give them with information on cognitive strategies, and provide opportunities for students to use these strategies, students must also be motivated to use the strategies to learn class material. Teaching students cognitive strategies takes time; for students who learn primarily via rote learning, learning to use deep processing means adjustment and change. However, higher-level thinking has relevance for students as a set of tools for mastering material that is difficult them to understand. The ability to have tools to understand difficult material, gives students an advantage when they encounter hard to grasp material in social studies classes or other academic classes. Having tools for learning information could also help students when they leave school and learn information in jobs or careers.

Potential limitations are an inherent part of every research project. Having interviews with open-ended questions encourages students to describe their own learning

experiences in their own words and rich detail. However, interviewing students from only one school in one community in a southwestern state limits my ability to generalize the results on a national scale. Likewise, I tried to create an atmosphere during the interviews that encouraged candor. However, the rich detail that can come from the interview format is counterbalanced by the knowledge that some participants may lie or to give socially desirable answers. Finally, interviewing students from a primarily Caucasian high school promotes a homogenous sample, but is counterbalanced by the knowledge that students of other races or cultures may use different or additional strategies. Future research might sample students of different races or cultures to explore their use of cognitive strategies. This additional knowledge could be used to benefit students of all races and cultures.

In terms of teacher education, this study emphasizes the needs to expose education students to higher order thinking skills and the relevance of these skills in life inside and outside the classroom. Exposing our future teachers to Boom's taxonomy (Bloom et al., 1956) and Howard Gardner's theory of multiple intelligences (Gardner & Hatch, 1989) gives them valuable skills for processing information that they can pass on to their students. For learning how to learn can benefit students in their schoolwork and their daily life.

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Tables

Table 1. Demographic – Number of student participants

Number of the student participants				
	Direct Instruction		Indirect Instruction	
Gender	Average	Advanced	Average	Advanced
Female	5	5	5	5
Male	5	5	5	5

Table 2. Demographic – Race of the student participants

Race of the participants

	Direct Instruction		Indirect Instruction	
Gender	Average	Advanced	Average	Advanced
Female				
Caucasian	5	0	4	4
Hispanic	0	0	1	0
American Indian	0	0	0	0
Mixed	0	0	0	1
Male				
Caucasian	5	5	4	3
Hispanic	0	0	0	0
American Indian	0	0	0	1
Mixed	0	0	1	1

Table 3. Demographic – Age of the student participants

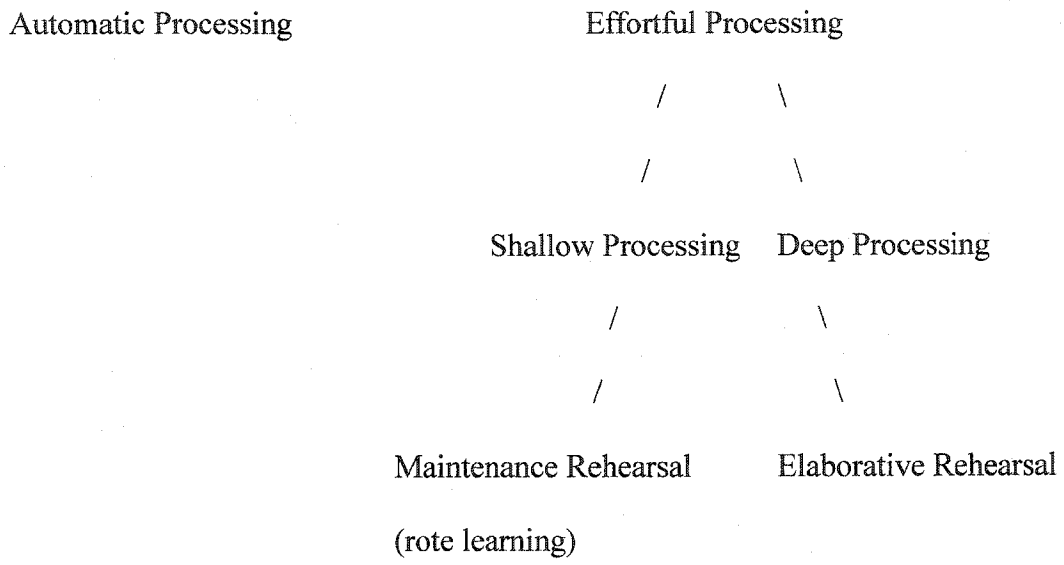
Age of the participants

	Direct Instruction		Indirect Instruction	
Gender	Average	Advanced	Average	Advanced
Female				
15 years old	0	0	2	3
16 years old	2	2	2	2
17 years old	3	3	1	0
18 years old	0	0	0	0
Male				
15 years old	0	0	1	0
16 years old	1	0	2	4
17 years old	4	4	2	1
18 years old	0	1	0	0

Illustration

Illustration 1

Cognitive processing



Appendix

Appendix A – IRB Assent Form

Appendix B - IRB Parental Permission Form

Appendix C – IRB Informed Consent Form

Appendix D – IRB Tape Recorded Interview Letter

Appendix E – Interview questions – Students

Appendix F – Interview questions - Teachers

Appendix A

IRB ASSENT FORM

ASSENT FORM

FOR RESEARCH BEING CONDUCTED UNDER THE AUSPICES OF THE

UNIVERSITY OF OKLAHOMA – NORMAN CAMPUS

STUDENT VERSION

INTRODUCTION: This study is entitled "Learning strategies, cognitive strategies, and process variables used by high school students in social studies classes". The person directing this project is Leisa A. Martin (graduate student at the University of Oklahoma and principle investigator) under the supervision of faculty sponsor John J. Chiodo, Ph.D. This document defines the terms and conditions for consenting to participate in this study.

DESCRIPTION OF THE STUDY: High school students often have perceptions and beliefs about the ways students learn in their social studies classes. Often, students are not given the opportunity to explain their reasons for these beliefs and perceptions. As a student, it is important for your perceptions on learning to be recorded. The interview will take approximately thirty minutes. Research will be conducted at a time convenient for the participants such as lunch or free periods. Research may be conducted during normal school hours, before normal school hours, or after normal school hours. The prospective participants in this study will not be enrolled in classes currently taught by the primary investigator. Students will not miss any regular coursework. The general purpose of this study is to understand the ways that students learn in their high school social studies classes. Students and teachers will be interviewed on the way that students learn.

Procedures for the students will be the following:

The primary investigator will contact potential participants. The primary investigator will explain that the study seeks to understand the ways that students learn information in their social studies classes. A student who wishes to participate will be given one IRB form for their parent / legal guardian to sign and one IRB form for the student to sign. Students who return both forms can participate in an interview. The interview will take approximately thirty minutes. If the primary investigator needs to clarify information, an additional interview session will be scheduled. The interview will take place at the school in a quiet area at a time convenient for the student such as during lunch, after school, or during the student's study hall. The questions will center on the ways that students learn.

Interview questions

Students will be asked the following questions:

- What is your gender?
- What is your age?
- What is your race?
- Can you explain to me how you learn information in your social studies class?
- Do you use any specific strategies for learning class material?
- How often do you use these strategies?
- Where did you acquire this approach to learning information?

- Did you acquire this approach to learning on your own or with the help of others?
- Does the teacher's methods of instruction have any effect on the learning strategies / cognitive strategies / process variables that you use?

RISKS AND BENEFITS: There are no foreseeable risks, beyond those present in routine daily life, are anticipated in this study. The primary investigator does not anticipate any risk to participants because the study will only involve an interview and questions about the way that students learn in their social studies classes. Students will not receive benefits such as course credit or compensation. Students and teachers will benefit society because they can help educators better understand the ways students learn information in high school social studies classes.

CONDITIONS OF PARTICIPATION: Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which the student is otherwise entitled. Furthermore, the participant may discontinue participation at any time without penalty or loss of benefits to which the participant is otherwise entitled. Participants under 18 years of age must have a parent/legal guardian sign a parental permission form. Participants in this study will not be enrolled in classes currently taught by the primary investigator.

CONFIDENTIALITY: Findings will be presented in aggregate form with no identifying information to ensure confidentiality. The interview tapes and transcripts will be stored in a locked cabinet when not being used and destroyed after the study is completed.

AUDIO TAPING OF STUDY ACTIVITIES: To assist with accurate recording of participant responses, interviews may be recorded on an audio recording device. Participants have the right to refuse to allow such taping without penalty. Please select one of the following options.

[ ] I consent to the use of audio recording.

[ ] I do not consent to the use of audio recording.

CONTACTS FOR QUESTIONS ABOUT THE STUDY: Participants may contact Leisa A. Martin at (405) 325-1498 or faculty sponsor, John J. Chiodo, at (405) 325-1498 with questions about the study.

For inquiries about rights as a research participant, contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405/325-4757 or irb@ou.edu. Participants do not waive their legal rights by signing an informed consent form. Participants should keep their copy of the informed consent form.

PARTICIPANT ASSURANCE: I have read and understand the terms and conditions of this study and I hereby agree to participate in the above described research study. I understand my participation is voluntary and that I may withdraw at any time without penalty.

_____	_____
Signature of Participant	Date
_____	_____
Printed Name of Participant	Researcher Signature

Appendix B

IRB PARENTAL PERMISSION FORM

PARENTAL PERMISSION FORM

FOR RESEARCH BEING CONDUCTED UNDER THE AUSPICES OF THE

UNIVERSITY OF OKLAHOMA – NORMAN CAMPUS

INTRODUCTION: This study is entitled "Learning strategies, cognitive strategies, and process variables used by high school students in social studies classes". The person directing this project is Leisa A. Martin (graduate student at the University of Oklahoma and principle investigator) under the supervision of faculty sponsor John J. Chiodo, Ph.D. This document defines the terms and conditions for consenting to participate in this study.

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Procedures for the students will be the following:

The primary investigator will contact potential participants. The primary investigator will explain that the study seeks to understand the ways that students learn information in their social studies classes. A student who wishes to participate will be given one IRB form for their parent / legal guardian to sign and one IRB form for the student to sign. Students who return both forms can participate in an interview. The interview will take approximately thirty minutes. If the primary investigator needs to clarify information, an additional interview session will be scheduled. The interview will take place at the school in a quiet area at a time convenient for the student such as during lunch, after school, or during the student's study hall. The questions will center on the ways that students learn.

Interview questions

Students will be asked the following questions:

- What is your gender?
- What is your age?
- What is your race?
- Can you explain to me how you learn information in your social studies class?
- Do you use any specific strategies for learning class material?
- How often do you use these strategies?
- Where did you acquire this approach to learning information?
- Did you acquire this approach to learning on your own or with the help of others?

- Does the teacher's methods of instruction have any effect on the learning strategies / cognitive strategies / process variables that you use?

RISKS AND BENEFITS: There are no foreseeable risks, beyond those present in routine daily life, are anticipated in this study. The primary investigator does not anticipate any risk to participants because the study will only involve an interview and questions about the way that students learn in their social studies classes. Students will not receive benefits such as course credit or compensation. Students and teachers will benefit society because they can help educators better understand the ways students learn information in high school social studies classes.

CONDITIONS OF PARTICIPATION: Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which the student is otherwise entitled. Furthermore, the participant may discontinue participation at any time without penalty or loss of benefits to which the participant is otherwise entitled. Participants under 18 years of age must have a parent/legal guardian sign a parental permission form. Participants in this study will not be enrolled in classes currently taught by the primary investigator.

CONFIDENTIALITY: Findings will be presented in aggregate form with no identifying information to ensure confidentiality. The interview tapes and transcripts will be stored in a locked cabinet when not being used and destroyed after the study is completed.

AUDIO TAPING OF STUDY ACTIVITIES: To assist with accurate recording of participant responses, interviews may be recorded on an audio recording device. Participants have the right to refuse to allow such taping without penalty. Please select one of the following options.

[ ] I consent to the use of audio recording.

[ ] I do not consent to the use of audio recording.

CONTACTS FOR QUESTIONS ABOUT THE STUDY: Participants may contact Leisa A. Martin at (405) 325-1498 or faculty sponsor, John J. Chiodo, at (405) 325-1498 with questions about the study.

For inquiries about rights as a research participant, contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405/325-4757 or irb@ou.edu. Participants do not waive their legal rights by signing an informed consent form. Participants should keep their copy of the informed consent form.

PARTICIPANT ASSURANCE: Students who are under the age of 18 and who wish to participate must obtain permission to do so from a parent or legal guardian. I, the parent / legal guardian, verify that the student is under the age of 18. I, the parent / legal guardian, have read and understand the terms and conditions of this study and I hereby give my permission for the student to participate in the above described research study. I understand that the student's participation is voluntary and that the student may withdraw at any time without penalty.

Parent / legal guardian: Please print the child's name. _____

_____ _____

Signature of Parent / Legal Guardian Date

_____ _____

Printed Name of Parent / Legal Guardian Researcher Signature

Appendix C

IRB INFORMED CONSENT FORM

INFORMED CONSENT FORM FOR RESEARCH BEING CONDUCTED UNDER THE AUSPICES OF THE UNIVERSITY OF OKLAHOMA-NORMAN CAMPUS

TEACHER VERSION

INTRODUCTION: This study is entitled "Learning strategies, cognitive strategies, and process variables used by high school students in social studies classes". The person directing this project is Leisa A. Martin (graduate student at the University of Oklahoma and principle investigator) under the supervision of faculty sponsor John J. Chiodo, Ph.D. This document defines the terms and conditions for consenting to participate in this study.

DESCRIPTION OF THE STUDY: High school students often have perceptions and beliefs about the ways students learn in their social studies classes. Often, students are not given the opportunity to explain their reasons for these beliefs and perceptions. As a teacher, it is important for your perceptions on learning to be recorded. The interview will take approximately thirty minutes. Research will be conducted at a time convenient for the participants such as lunch or free periods. Research may be conducted during normal school hours, before normal school hours, or after normal school hours. Teachers will not miss any regular coursework. The prospective participants in this study will not be enrolled in classes currently taught by the primary investigator. The general purpose of this study is to understand the ways that students learn in their high school social studies

classes. Teachers will be interviewed on the way that students learn. The interview will take approximately thirty minutes.

Procedures for the teachers will be the following:

The primary investigator will contact potential participants. The primary investigator will explain that the study seeks to understand the ways that students learn information in their social studies classes. Teachers who wish to participate will sign the IRB form. The interview will take approximately thirty minutes. If the primary investigator needs to clarify information, an additional interview session will be scheduled. The interview will take place at the school in a quiet area at a time convenient for the teacher such as during lunch, after school, or during the teacher's planning period. The questions will center on the ways that students learn.

Interview questions

Teachers will be asked the following questions:

- What is your gender?
- What is your age?
- What is your race?
- What is your educational background (bachelors, masters, Ph.D.)?
- How many years have you spent teaching?
- What are the student participants' nine-week grade (numeric, not letter) for the course?

- How do you think that students learn information your social studies classroom?
- Where do you think that your students acquire these learning strategies?
- Do you think that the students learned these strategies on their own or through the help of others people? If through other people, who do you think that these people are?
- Do you think that your students changed the way that they learned in order to adapt to your class?
- Can you describe your teaching style (your teaching method, i.e. the way you teach)?
- Do you think that your teaching style has any effect on the students' learning strategies / cognitive strategies / use of process variables?
- Do you think that advanced students in social studies classes use learning/cognitive strategies that are similar or different form the learning /cognitive strategies used by average students in social studies classes? What is your gender?

RISKS AND BENEFITS: There are no foreseeable risks, beyond those present in routine daily life, are anticipated in this study. The primary investigator does not anticipate any risk to participants because the study will only involve an interview and questions about the way that students learn in their social studies classes. Teachers will not receive benefits such as course credit or compensation. Teachers will benefit society because

they can help educators better understand the ways students learn information in high school social studies classes.

CONDITIONS OF PARTICIPATION: Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which the student is otherwise entitled. Furthermore, the participant may discontinue participation at any time without penalty or loss of benefits to which the participant is otherwise entitled.

CONFIDENTIALITY: Findings will be presented in aggregate form with no identifying information to ensure confidentiality. The interview tapes and transcripts will be stored in a locked cabinet when not being used and destroyed after the study is completed.

AUDIO TAPING OF STUDY ACTIVITIES: To assist with accurate recording of participant responses, interviews may be recorded on an audio recording device. Participants have the right to refuse to allow such taping without penalty. Please select one of the following options.

[ ] I consent to the use of audio recording.

[ ] I do not consent to the use of audio recording.

CONTACTS FOR QUESTIONS ABOUT THE STUDY: Participants may contact Leisa A. Martin at (405) 325-1498 or faculty sponsor, John J. Chiodo, at (405) 325-1498 with questions about the study.

For inquiries about rights as a research participant, contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405/325-4757 or irb@ou.edu. Participants do not waive their legal rights by signing an informed consent form. Participants should keep their copy of the informed consent form.

PARTICIPANT ASSURANCE: I have read and understand the terms and conditions of this study and I hereby agree to participate in the above described research study. I understand my participation is voluntary and that I may withdraw at any time without penalty.

_____	_____
Signature of Teacher Participant	Date
_____	_____
Printed Name of Teacher Participant	Researcher Signature

Appendix D

IRB TAPE RECORDED INTERVIEW LETTER

TAPE RECORDED INTERVIEW

February 3, 2003

Dear participant,

I am a graduate student under the direction of Professor Chiodo in the Instructional Leadership and Academic Curriculum Department at the University of Oklahoma – Norman Campus. I invite you to participate in an interview as part of a research study being conducted under the auspices of the University of Oklahoma – Norman Campus entitled "Learning strategies, cognitive strategies, and process variables used by high school students." The purpose of this study is to better understand the way that students learn information in their high school social studies classes.

Your participation will involve completing a demographics questionnaire and participating in the interview. The interview will be audio-tape recorded. It should only take about thirty minutes. You involvement in the study is voluntary, and you may choose not to participate or to stop at any time. The results of the research study may be published, but your name will not be used. In fact, the published results will be presented in summary form only. All information you provide will remain strictly confidential and released only with explicit written information.

The findings from this project will provide information on the ways that students learn information in their social studies classes and may help educators better understand the ways students learn information in high school social studies classes with no cost to you other than the time that it takes for the interview.

If you have any questions about this research project, please feel free to call Ms. Martin at (405) 325-1498 or Dr. Chiodo at (405) 325-5317 or e-mail Ms. Martin at **martin422@ou.edu**. Questions about your rights as a research participant or concerns about the project should be directed to the Office of Research Services at the University of Oklahoma- Norman Campus at (405) 325-4757 or **irb@ou.edu**.

I would like to audio-tape this interview. Do I have your permission to audiotape the interview?

Thanks for your help!

Sincerely,

Leisa A. Martin

Graduate Student

Appendix E

INTERVIEW QUESTIONS - STUDENTS

Appendix E

INTERVIEW QUESTIONS – STUDENTS

Students will be asked the following questions:

- What is your gender?
- What is your age?
- What is your race?
- Can you explain to me how you learn information in your social studies class?
- Do you use any specific strategies for learning class material?
- How often do you use these strategies?
- Where did you acquire this approach to learning information?
- Did you acquire this approach to learning on your own or with the help of others?
- Does the teacher's methods of instruction have any effect on the learning strategies / cognitive strategies / process variables that you use?

Appendix F

INTERVIEW QUESTIONS - TEACHERS

Appendix F

INTERVIEW QUESTIONS - TEACHERS

Teachers will be asked the following questions:

- What is your gender?
- What is your age?
- What is your race?
- What is your educational background (bachelors, masters, Ph.D.)?
- How many years have you spent teaching?
- What are the student participants' nine-week grade (numeric, not letter) for the course?
- How do you think that students learn information your social studies classroom?
- Where do you think that your students acquire these learning strategies?
- Do you think that the students learned these strategies on their own or through the help of others people? If through other people, who do you think that these people are?
- Do you think that your students changed the way that they learned in order to adapt to your class?
- Can you describe your teaching style (your teaching method, i.e. the way you teach)?
- Do you think that your teaching style has any effect on the students' learning strategies / cognitive strategies / use of process variables?

- Do you think that advanced students in social studies classes use learning/cognitive strategies that are similar or different form the learning /cognitive strategies used by average students in social studies classes?