COMPARING TEACHER-DIRECTED AND COMPUTER-ASSISTED INSTRUCTION OF ELEMENTARY GEOGRAPHIC PLACE VOCABULARY

by

DENISE E. SALSBURY

B.M.E., Baker University, 1974

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment
of the
requirements for the degree

DOCTOR OF PHILOSOPHY

College of Education
Department of Elementary Education

KANSAS STATE UNIVERSITY
Manhattan, Kansas

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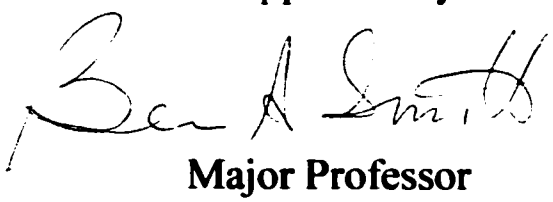

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ABSTRACT

The purpose of this study was to compare computer-assisted instruction to teacher-directed instruction for teaching elementary geographic place name vocabulary. During instruction, students were taught to use drill and practice strategies via the two methodologies to identify and label geographic place names on a world map. The importance of fundamental geographic knowledge to student academic achievement success stems from geographic education research in the 20th Century (Fuson, 1999; Saveland, 1980; Smith, 1986).

The quasi-experimental research design (Campbell & Stanley, 1963) of pretest, treatment, and posttest was employed in this study since the students were in pre-assigned classrooms. Two classrooms received instruction for learning to identify and label 50 world places, and a third class was the control group. Overall data analysis revealed significant difference between the two methods of instruction when compared to each other, and to the control group. Gains in pretest to posttest scores were greater from computer-assisted instruction. Both methods used highly organized procedures, extensive content coverage, and consistent monitoring of student progress which appeared to influence the increase in pretest to posttest scores. These characteristics of teacher-directed instruction have been found to contribute to improved student academic achievement (Chall, 2000; Izumi & Coburn, 2001).

The most fundamental knowledge is the recall of facts, naming vocabulary, and repeating specific pieces of information. When using geographic skills to gain a spatial perspective on human and physical characteristics of the world, maps, computers, and

multimedia equipment are only a few of the tools used by students to gather information (Audet & Ludwig, 2000; May, 2001).

Place knowledge is a vital part of students learning of social studies content, particularly geographic concepts and perceptions, that can help them to become more conscious of the world around them, prepare to enter a global workplace, and become responsible citizens. This study has reported the highly significant academic success of fourth grade students learning geographic place name vocabulary through drill, whether a teacher or a computer provides the instruction. The success of computer-assisted instruction in this study directly relates to the computer program used, Click and Learn Software© (Reynolds, 2002).

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Chapter 1

INTRODUCTION

This study compared computer-assisted instruction and teacher-directed instruction of elementary geographic place name vocabulary. Place name vocabulary refers to terms used to identify natural or geopolitical features on Earth's surface (Fuson, 1966; Smith, 1986). The importance of geographic place name vocabulary to student academic achievement success stems from geographic education research in the 20th Century (Clark, 1969; Fuson, 1961; Saveland, 1980). As yet no specific instructional strategy is recommended over the other for increasing geographical knowledge (Borman & Schneider, 1998). "Research in all aspects of teaching and learning geography is urgently needed" (Gregg, 2001).

Justification

The importance of this study is based on research that indicates the effectiveness of teacher-directed instruction for improving student learning of content concepts (Ellis & Fouts, 1997; Izumi & Coburn, 2001). Past studies focus on the success of various teacher-directed instructional strategies, such a mnemonic devices, drill, and practice, for increasing student geographic knowledge of place name vocabulary (Bednarz, 1995; Smith, 1986; Wright, 1995). This study considers whether or not computer-assisted instruction, in comparison to teacher-directed instruction, will be a successful method for improving student geographic knowledge of place name vocabulary.

The geographic place name vocabulary was the content delivered via the computer to individual students. The computer acted as a tutor instructing students to

identify and locate 50 world places on a world map through a drill and practice on-line computer program. The same factual place name content was delivered during instruction from the teacher. Both instructional methodologies were highly organized, content-specific, and set within specific time limits.

In general, improving academic achievement depends on whether or not students learn the basic knowledge required for integrating and connecting new information and skills that will form a foundation for future learning (Crabtree, 1992; Fredericks, 2000). "Principals and teachers have always been motivated to ensure student success; they need better methods and materials, not just consequences for failure" (Slavin, 2000-2001, p. 2). Educators may be required to redefine valid methods of classroom instruction when preparing students to be responsible and active citizens meeting the demands of a global society of the 21st Century (Geography Education Standards Project [GESP], 1994; Kellough, Jarolimek, Parker, Martorella, Tompkins, & Hoskisson, 1996; National Council for the Social Studies [NCSS], 1994).

A Foundation of Learning

An adequate knowledge base is required for individuals to be successful citizens, therefore curriculum and instruction must be adapted according to the level of information to be learned. Individual disciplines within social studies emphasize which specific curricular content is taught at each grade level to diverse populations for knowledge construction (Kemp, Morrison, & Ross, 1994; NCSS, 1994). Social studies instruction reflects the commitment of educators to teach students how to build concepts, values, perspectives, and skills from foundational knowledge (Marker & Mehlinger, 1992). For instance, a social studies teacher may want students to remember basic facts

pertaining to the American Revolution during one lesson, to comprehend the problems surrounding immigration adaptation in a later unit, and to evaluate the pros and cons of a democratic society in a third case (Eggen & Kauchak, 1996). This sequence of instructional strategies from recall through analysis to evaluation demonstrates balanced and natural progression of thinking for integrating prior knowledge and other cognitive levels. "The process of testing, refining, and reformulating knowledge is called knowing" (Riner, 2000, p. 35). Social studies, in general, are best taught through meaningful and challenging learning experiences that promote active learning within an integrative curriculum.

Research has found the existence of several levels of knowledge (Anderson & Krathwohl, 2001). The most basic level of knowledge is considered to be recall of facts, naming vocabulary, and specific pieces of information. Anderson and Krathwohl (2001) consider the development of factual knowledge as an act of knowing discrete, isolated elements of information, which includes learning vocabulary and specific content details. For instance, people receive information about their world through a variety of rapid and mass communication devices, whether from satellite, digital, audio, or other newly innovative sources, yet find it difficult to locate specific places on a map (Fuson, 1966; GESP, 1994). Identification of geographical locations is a fundamental skill, such as a multiplication fact is to math. Research provides a solid argument for a foundation of learning with a base of information consisting of specific facts, details, vocabulary, and symbols from all disciplines (GESP, 1994; NCSS, 1994; Saveland, 1980).

The social studies curriculum, by its integrative nature, is based on multiple subject disciplines and promotes the use of a variety of materials and instructional

strategies to develop student self-motivation (Irvin, Lunstrum, Lynch-Brown, & Shepard, 1995). Geographic education, as one of the social studies disciplines, emphasizes the importance of increasing student knowledge by understanding that all environments and people are interconnected within a variety of spatial contexts (GESP, 1994; Gregg & Leinhardt, 1993). Improved student academic achievement in geographic knowledge has long been a goal of educators and society in general (Fuson, 1966; Bednarz & Petersen, 1993; Walberg, 1997).

In 1994, national and state social studies curricular standards were initiated and eventually published for several disciplines to identify what students should learn, why they should learn it, and when they should learn it (GESP, 1994; NCSS, 1994). Specifically, social studies and geography standards established guidelines for student learning at all grade levels. National social studies standards were built around ten themes (NCSS, 1994). At the national level, six key elements contain the eighteen geographic standards (GESP, 1994).

Ultimately, questions arise concerning what geographic knowledge, skills, and perspectives students should learn, as well as how and when they are learning them (Bednarz, 1996). It has been assumed that geographic content and skills are incorporated into social studies curriculum at all grade levels (Farris, 2001; Gregg & Leinhardt, 1993). That, however, does not appear to be the case. Social studies curriculum changes from grade level to grade level and topics taught in one grade level may not be taught at that grade level in another state (Martorella & Beal, 2002). Gaps could occur in the assumed common knowledge base of all United States citizens since curriculum within the social studies disciplines at each grade level is autonomous from state to state, and has been

based on nonequivalent state standards developed to suit individual state expectations and requirements (Bednarz, 1998; Chapin & Messick, 2002). National curricular standards attempt to point out a common knowledge base that should be taught and learned at each grade level, but are considered voluntary by individual states which wrote their own versions of standards (Bednarz, 1998; GESP, 1994; NCSS, 1994).

The importance of a common knowledge base for all citizens becomes clearer when considering knowledge as the foundation of all social studies instruction (Kellough, et. al., 1996). And in a typical social studies curriculum, whatever the grade level or the content topic, geography is considered the discipline for providing individuals with specific knowledge, such as absolute or relative location and characteristics of countries, regions, and other points, and skills, such as questioning, collecting, organizing, and evaluating data from maps (Dueck, 1976). Geographical concepts show the relationships between physical characteristics and human behaviors as well as their interaction with each other (GESP, 1994; Parker, 2001). "Geography is composed of three interrelated and inseparable components: subject matter, skills, and perspectives" (Keiper, 1999, p. 22). Central to increasing an individual's basic geographic knowledge is a sense of place (Salter, 1995).

The importance of geographic knowledge, skills, and perspectives is stressed, in a comprehensive assessment of geographic research, Rediscovering Geography: New Relevance for Science and Society (1997), for educating citizens living in a global society. Societal expectations for the future can be achieved by strengthening geographical knowledge, education, and proficiency (Rediscovering Geography Committee, 1997). Various tools are used when developing geographic skills to gain a

spatial perspective on human and physical characteristics of the world. Maps and technology are included in the extensive list of geographic tools (Audet & Ludwig, 2001; GESP, 1994; Walsh, 1988).

Traditionally, maps have been a source of information for geographers (Gregg, 1997). If United States citizens are to be considered geographically literate, they must learn to obtain information from maps (GESP, 1994). Map reading, map interpreting, and making a map inference are the processes for retrieving map data (Gregg, 1994). Map reading occurs as a person identifies a point, line, area, or other specific data from a map. Map interpretation results when a person identifies spatial relationships between two or more pieces of map data to pinpoint patterns, which, in turn, become meaningful data. Map inferencing occurs when a person surmises relationships between two or more pieces of map data that are not specifically labeled on the map, but provide an avenue for drawing conclusions and allowing transference using prior knowledge (Gregg, 1997).

Geography, as a discipline, contributes a unique combination of concepts, skills, and perspectives to the common base of knowledge assumed that all educated citizens need to have to be considered geographically literate (Gregg, & Leinhardt, 1993; Grosvenor, 1995). While it is in the best interest of society to promote and expand geographic instruction in the classroom, it is important to consider what tools are used during instruction to build a strong foundation in geographic knowledge and skills. Instruction in geographic knowledge increases student attention to contemporary issues and provides an avenue for integrating content and skills linked with other disciplines (Rediscovering Geography Committee, 1997).

Research has found it necessary for successful individuals to build a body of foundational knowledge (Anderson & Krathwohl, 2001; Slater, 1982). "It is important to note that, as the major objective of social studies moves from social problems to understanding, the role of knowledge takes on greater importance" (Chall, 2000, p. 77). This study focuses on two methods of instruction, teacher-directed and computer-assisted, for teaching a knowledge foundation of facts, specifically geographic place name vocabulary. During the study, the geographic instruction teaches students to efficiently acquire and retrieve meaningful facts, since "citizens frequently need to remember a great number of names, places, events, dates, and general descriptive information in order to clarify and link new knowledge in functionally meaningful ways" (Kellough, et. al., 1996, p. 374). One such form of meaningful fact is geographic place name vocabulary (Ballas, 1960).

Teacher-directed instruction

Many features of this study parallel previous studies that have focused on various methods of teacher-directed instruction (Bednarz, 1995; Saveland, 1980; Smith, 1986). However, the purpose of this study is not to compare various strategies and derivations of teacher-directed instruction. Instead, this study compares computer-assisted instruction to teacher-directed instruction for teaching geographic place name vocabulary. This type of comparison is possible if a teacher is considered a 'type of tool,' which is able to deliver different types of instruction on a continuum from direct to indirect.

There is a body of empirical research supporting teacher-directed instruction as a means for providing students with strategies for learning, clarifying, and linking content knowledge. Rosenshine's description, quoted by Darling-Hammond and Snyder, defines

direct instruction as "academically focused, teacher directed classrooms using sequenced and structured materials" (Ellis & Fouts, 1997, p. 212). The methodology of teacher-directed instruction outlines highly structured and sequential teacher-student interactions, and many of these interpersonal contacts have been found to correlate with student achievement (Click, 1999).

In an effort to make sense of their world as whole, humans instinctively attempt to explore and evaluate their interactions and environment. People undertake this learning process minute-by-minute, continuously questioning, adapting, and modifying their actions and interactions to fit the situation. They also strive to develop an understanding of their cultural framework and gain a spatial perspective of their world (Eggen & Kauchak, 1996; Slater, 1982).

Teacher-directed instruction will not be associated with any one model of instruction in this study. Instead, the method will be representative of the basic characteristics of teacher-directed instruction: highly organized lesson structure, identification of student goals, extensive content coverage, specific time on task, immediate feedback, and consistent monitoring of student performance.

Computer-assisted instruction

Instruction in the classroom has been greatly impacted by technological advances in the last half of the 20th Century (Barstow, 1994). Students are expected to exhibit advanced knowledge and technological skills in the work place if they are to become responsible and successful citizens of the 21st Century (NCSS, 1994). Multimedia equipment and computers have become accepted and expected tools in the classroom, thus, influencing how students receive instruction (Audet & Ludwig, 2000).

Computerized classroom instruction has become more prevalent with the advent of technology-trained teachers, less expensive hardware, and more versatile software, while providing students with links to graphics and information they consider motivating during instruction (Audet. 1994; Good & Brophy, 2000). Technological tools are often used to motivate students and encourage them to take responsibility for their own learning (Svingen, 1994).

Many educators believe a technological framework could produce an innovative method of geographic instruction that would improve overall student academic achievement (Bednarz, 1997; Hill and Solem, 1999; Hurley, Proctor, & Ford, 1999; Sui and Bednarz, 1999). Demands in society and the workforce are for individuals with increased technical and factual knowledge (Chall, 2000). Some research has placed emphasis on students gaining knowledge of geographic content and process skills through computer-assisted learning opportunities in the classroom (Audet & Ludwig, 2000; Keiper, 1999).

Technology is believed to be the major tool to enhance geographic instruction. Barstow (1994) pinpoints the power that computers have to assist in map interpretation and as a resource for vast amounts of data. Innovative and versatile computer use in the classroom provides students with an avenue for learning geographic concepts, skills, and perspectives that relate to real-life issues (Association of American Geographers, 1969; Audet & Ludwig, 2000).

Current and future educational goals for the United States include a technology component. National professional organizations, such as the ISTE Technology Foundation, have developed technological standards to guide classroom curriculum and

instructional methods (International Society for Technology in Education [ISTE], 2000). "Included in the NCATE standards is a technology theme that calls for professional educators and schools of education to provide adequate access to computers and technology and to base all teaching programs on recognized content and teaching standards" (May, 2002, p. 4).

Computer-assisted instruction, in the very broadest sense, is any instructional strategy available through a computer (Association of American Geographers, 1969). There are many forms of instruction categorized as computer-assisted instruction, from individualized tutorials to investigative explorations. In other words, if a computer delivers the instruction, the instruction is said to be computer-based, computer-aided, or computer-assisted (Roberts, Friel, & Ladenburg, 1988). Some computer programs contain similar characteristics that are considered elements of teacher-directed instruction. Immediate feedback, consistent monitoring of student performance, and a highly organized software structure are a few similar elements (Reynolds, 2002). Fitzpatrick (1990) suggests that students benefit from computers "not simply from the amount of information to be accessed, but from the mode as well" (p. 149).

Theoretical Framework

Standardized curriculum continues to generate discussion across the United States as the majority of students at all age levels persistently demonstrate lack of knowledge in most essential subject areas (Evers, 1998). Nationally standardized assessments depict a nation of students still unable to meet the high expectations stressed within the Goals 2000: Educate America Act (Bednarz, 1998). Educators strive to prepare students for

responsible citizenship and productive adult careers. If future generations of U.S. citizens are to succeed in a global society, geographic knowledge is vital (GESP, 1994: NCSS, 1994). Challenging content is emphasized and required within all the core disciplines, and geography is included as one of these main disciplines in the Goals 2000: Educate America Act (GESP, 1994). Despite the increasing importance of geography in current societal events, there continues to be confusion and decreasing emphasis on how and when to include geographic education during a student's academic life (Boehm, 2002; Hanna, Sabaroff, Davies, Gordon, & Farrar, 1966).

In 1994, the same year the National Social Studies Standards were published, the National Geography Standards were published by the Geography Education Standards Project under the sponsorship of four nationally-known geographic organizations: the American Geographical Society, Association of American Geographers, National Council for Geographic Education, and National Geographic Society (GESP, 1994). These standards target important geographic concepts and skills all people should know to be responsible and successful citizens in a global society (Bednarz, 1994). The National Geography Standards provide curricular guidelines pinpointing the geographic concepts and skills every American student should learn at particular grade levels. To achieve this goal, geography educators share "a unifying theme—commitment and dedication to excellence in geographic education" (Bednarz & Petersen, 1993, p. 64). "For the United States to maintain leadership and prosper in the twenty-first century, the education system must be tailored to the needs of the productive and responsible citizenship in the global economy" (GESP, 1994, p. 9).

Standards-based curriculum for elementary grade levels has established high expectations for student learning within all disciplines. One of the most challenging and complex of the disciplines is the social studies (Smith, 1997). "The more students engage with (social studies) content and concepts, the more effectively they will learn" (Irvin, et. al., 1995, p. 1). Common knowledge of social studies concepts and skills have been anchored to standards as curricular threads from history, geography, economics, civics, anthropology, and other related disciplines (Farris, 2001; NCSS, 1994).

State social studies standards, however, have been created to guide the development of elementary curriculum and define the scope and sequence of student knowledge by grade level (Bednarz, 1998). Across the U.S. there is still a lack of uniformity within social studies standards since many states did not tie their standards to either the National Social Studies Standards or the National Geography Standards. In the past few years state standards were evaluated and found "geography is a single subject or strand in some of these state standards, but integrated with other social studies content in others" (Bednarz, 1998, p. 85). The importance of geographic information to students is articulated as Salter and Salter (1991) identify how the success of the nation must include the discipline of geography in schools. The national standards are considered to be generalizable and adaptable to any curriculum, yet specific enough to provide insightful guidance (Bednarz & Bednarz, 1994).

Over time, knowledge is classified and generalized by an individual so the information can be used to produce something, or applied to other knowledge, to be synthesized further in the process of learning (Anderson and Krathwohl, 2001; Bloom, 1974; Brown, 1994). Rosenshine (1979) stated that elaboration, consistent review, active

practice, rehearsal, and summarization aided in relating new information to prior knowledge. Prior learning that is automatic and easily retrieved is a key factor for increasing student knowledge of new material (Izumi, 2001).

Statement of the Problem

In What's Gone Wrong in America's Classrooms?, Evers (1998) questions the effectiveness of public schools in general, yet suggests that the problem resides with certain practices in American classroom instruction. One reason for disappointment with public education, Grossen (1997) asserts, stems from failure to adhere to proven research on instructional procedures, yet evaluation data from the Follow-Through Project concluded "structured, teacher-directed instruction resulted in stronger academic outcomes than the popular child-centered models" (p. 28-29). Teacher-directed instruction sets the structures of student learning, allocates sufficient time for activities with clear goals, and cover a vast amount of content (Ellis & Fouts, 1997).

The need for specific content guidelines was recognized in the 1980s as educators and parents tried to identify what students were learning and were not learning as revealed by various assessments (Grosvenor, 1995). The National Council for the Social Studies (1994) developed national curriculum standards for social studies around ten major concepts as seen in Theme III: People, Places, & Environments, which relates specifically to geographical content and skills, and several more of the ten national social studies themes relate to geography. Despite the existence of voluntary National Geography Standards (1994), National Social Studies Standards (1994), a recommended scope and sequence of K-12 geographic concepts and skills (National Geographic Society

Foundation, 2001), and other incentives to include geography in elementary curriculum, an understanding of what is effective geographic instruction continues to be in question (Boehm, 2000; GESP, 1994; Gregg, 2001; NCSS, 1994). This study will compare the methods of teacher-directed and computer-assisted instruction for teaching geographic place name vocabulary.

Research Questions

Three research questions focused the direction of the study:

1. Will computer-assisted instruction improve student's ability to identify and locate places on a map?
2. Will teacher-directed instruction improve student's ability to identify and locate places on a map?
3. Will there be a significant difference between teacher-directed instruction in comparison to computer-assisted instruction based on gains in students' pretest and posttest scores?

Research Hypothesis

Students received treatments of computer-assisted or teacher-directed instruction to discover whether or not either or both methods increase student learning of geographic place vocabulary.

The following three hypotheses form the basis of the study:

H_{01} –Students receiving computer-assisted instruction will demonstrate a significant difference between pretest and posttest scores.

H_{02} –Students receiving teacher-directed instruction will demonstrate a significant difference between pretest and posttest scores.

H_{03} – There will be a significant difference between the pretest to posttest scores from teacher-directed instruction in comparison to computer-assisted instruction.

Research Design

This study used a quasi-experimental research design (Campbell & Stanley, 1963), which is also known as a nonequivalent control group design (Krathwohl, 1998). Comparison group pretest-posttest design is the label O'Sullivan and Rassel (1989) designate for a quasi-experimental design of pretest, treatment, and posttest. Whatever the label, unlike the subjects in a true experimental design, the subjects in the quasi-experimental design treatment groups are not randomly assigned. In this case, the subjects cannot be re-assigned from their classrooms into randomly selected groups. It is impossible to insure that the class groups are equivalent since they are organized in intact, pre-established groups since the beginning of the academic year. To move them into random groups at this point in, with only a few weeks left of the year, would be extremely disruptive for the students.

There were three groups of students participating in the study (Table 1.1, p. 16). Each group of students took the same pretest and posttest. Two groups, teacher-directed and computer-assisted, also received treatments. Teacher-directed instruction was given to Group A. Computer-assisted instruction was given to Group B. Group C was the control group.

Table 1.1

Research Design

	PRETEST	TREATMENT	POSTTEST
Group A: Teacher-directed instruction	O_1	X_1	O_2
Group B: Computer-assisted instruction	O_1	X_2	O_2
Group C: Control Group	O_1		O_2

n = 63

Note:

Quasi-experimental Research Design (Campbell & Stanley, 1963).

0_1 = Pretest
0_2 = Posttest
X_1 = Teacher-directed instruction
X_2 = Computer-assisted instruction

The design of the study was a pretest, treatment, and posttest procedure administered over ten days. Treatment was provided for 15 minutes a day for ten days to two groups of students, which resulted in 150 minutes of instruction per subject. The time limit does not include travel time to and from the computer lab for the subjects receiving the computer-assisted treatment.

Method

Three intact classrooms were selected from one school district for the study. The pilot study took place in the same school district, but was located in a separate building than the actual study. In the study, one classroom group of 22 students received teacher-directed instruction in the classroom. One classroom group of 21 students received computer-assisted instruction in the computer lab. One classroom of 20 students was the control group and received no instruction over the subject matter.

Prior to the study, the teachers received training, which covered all directions and scripts for giving instruction, as well as on-line instruction for treatment of human subjects. Each classroom teacher received scripted instructions to read during the treatments, as well as scripts for providing directions for taking both the pretest and posttest. The teacher-directed and computer-assisted instructional scripts were identical with the exception of initial computer technology set-up instructions. The teacher and students receiving the computer-assisted treatments were provided on-line access to a webpage supporting links to the geography content. All classroom sessions were video-recorded. The investigator kept in contact with the classroom teachers via e-mail and telephone to answer any questions that developed over the course of the treatments.

All subjects took pretests prior to receiving treatments, as well as posttests following treatments. All subjects in the fourth grade took the pretest at the same time. The purpose of the pretests was to assess student knowledge of 50 world places and their ability to label the places correctly within the correct shape on a blackline map of the United States. Over the course of the following ten days, students received treatment over geographic content for learning place name vocabulary. Students learned to identify and locate the 50 world places during the instructional treatments. The list of 50 world places includes countries from all hemispheres, major global cities, as well as a few oceans and seas (Smith, 1986). Following treatment, all subjects took a posttest. Students were expected to identify and label the location of places on a map during the posttest.

Treatment X_1 for Group A consisted of pretest, teacher-directed instruction, and posttest. Treatment X_2 for Group B consisted of pretest, computer-assisted instruction, and posttest. There was not a third treatment since Group C received no instruction stemming from this study; control group subjects only took the pretests and posttests.

Treatment #1: Daily students received 15 minutes of teacher-directed instruction treatment. A pretest was given on Day One to students. Treatment, during the following days, consisted of teacher-directed instruction of 50 world places, which includes world countries, major cities, and large bodies of water. First, the students learned the world places in alphabetical order, then learned them in random order, gradually increasing their speed for identifying the world places' locations. Choral responses were given by the students as a response to the teacher. A posttest was given at the end of

ten days. Students were expected to show improvement in their knowledge of the location of the places.

Treatment 2: Initially, the teacher provided a brief introduction to the computer software program, Click and Learn Software© (Reynolds, 2002). Following the instruction by the teacher, students received all instruction from the computer. Students received 15 minutes of computer-assisted instruction via the on-line computer software program. Click and Learn Software© provides opportunities for students to learn geographic content through computer-assisted instruction within drill and practice timed segments. Students were expected to follow the instruction provided on the computer. Students were expected to identify the location of a specific place as it was shown on the map provided on the monitor, and click on the correct location. First, students learned the 50 world places in alphabetical order, then learned them in random order, gradually increasing their speed for identifying the world places. A posttest was given at the end of ten days. Students were expected to show improvement in their knowledge of the location of places.

Treatment 3: There was not a third treatment. Students were the control group. They did not receive any instruction stemming from this study. Students received the pretest and posttest at the same time as the students in Group A and Group B. Without any specific instruction provided, it was doubtful whether or not students would show improvement in their knowledge of location of world places.

The investigator chose the geographic content (Saveland, 1980; Smith, 1986) to be studied by all groups. All students were taught to identify and locate 50 World Places. Instruction about how to manipulate the software program was also given to the classroom teachers by the investigator. The investigator provided a set of scripted instructions for the classroom teachers to use as they present directions, model expectations, and, as required, demonstrate how to manipulate the computer program on-line. All instructional information was written in small, incremental steps for ease in providing instruction over content quickly. Content to be covered during instruction was the same for all groups. Teachers were given a script to follow, which included exact statements and directions for providing specific instruction and for administering the pretest and posttest.

Pilot Study

Overview

The pilot study was launched to test whether or not the research plans and instructional procedures were adequate for collecting data comparing computer-assisted instruction to teacher-directed instruction. The pilot study was conducted over seven days with two fourth grade student groups. The treatment consisted of pretest, instruction, and posttest; only one day of instruction was possible between pretests and posttests due to the time frame (Table 1.2, p. 21). There was an extra day between treatment sets when no treatment was given due to time constraints.

Table 1.2

Pilot Study Treatment

		Computer-assisted instruction	Teacher-directed instruction
/	Day 1	Pretest	Pretest
50 States	Day 2	Instruction	Instruction
\	Day 3	Posttest	Posttest
	Day 4	No Treatment	
/	Day 5	Pretest	Pretest
50 World Places	Day 6	Instruction	Instruction
\	Day 7	Posttest	Posttest

Note:

The pilot study was conducted over seven days. Treatment consisted of pretest, treatment, and posttest. One day of instruction was given between pretests and posttests due to the time frame with an extra day between treatment sets when no treatment was given due to time constraints.

The pilot study design was a quasi-experimental design format (Campbell & Stanley, 1963; O'Sullivan & Rassel, 1989) since randomization of subject assignment was not possible. The pilot study was conducted in a suburban school with one teacher providing departmentalized instruction for 39 fourth grade social studies students. The subjects remained in their intact fourth grade social studies classrooms; they had been grouped within these classrooms since the first of the school year.

Following the policies established at Kansas State University, Parental Consent Forms [Appendix A] were sent home with the students three days before the Pilot Study began. Parental consent forms were sent home and returned; not all students received permission to participate in the pilot study. Consent forms were returned by 11 students in one classroom and by 7 students in the other classroom. Those students who obtained consent forms, yet were absent for any part of the treatment, were not included in the data analysis. This data rule existed throughout the pilot study and the research study. A total of 15 fourth grade students were involved in the pilot study.

During the Pilot Study treatment, two different content topics of place name vocabulary were covered, Set 1—"50 States" and Set 2—"50 World Places." Each student took a pretest before instruction began. Treatment consisted of 15 minutes of instruction a day for 6 days, which resulted in a total of 90 minutes of treatment. Following completion of content covered during the time frame, the students took the appropriate posttest. The overall time schedule was very brief, so actual instruction consisted of only one session of 15 minutes (Table 1.3, p. 23).

One teacher taught both treatment groups since social studies is taught in a departmentalized program at the fourth grade level on the site of the pilot study. The

Table 1.3

Pilot Study Treatment Sets

	Treatment Set A: "50 States"			**Treatment Set B: "50 World Places"**		
Group 1: Teacher-directed instruction	S_1	XS_1	S_2	W_1	XW_1	S_2
Group 2: Computer-assisted instruction	S_1	XS_2	S_2	W_1	XW_2	W_2

Note:

A quasi-experimental research design (Campbell & Stanley, 1963) was used for the Pilot Study.

S_1 = "50 States" Pretest
XS_1 = Teacher-directed instruction of "50 States" vocabulary
XS_2 = Computer-assisted instruction of "50 States" vocabulary
S_2 = "50 States" Posttest

W_1 = "50 World Places" Pretest
XW_1 = Teacher-directed instruction of "50 World Places" vocabulary
XW_2 = Computer-assisted instruction of "50 World Places" vocabulary
W_2 = "50 World Places" Posttest

social studies classes met in the afternoon, rotating daily: one class after the other. The first group of the day received the teacher-directed instruction treatment [PS-Group A]; the second group received the computer-assisted treatment [PS-Group B]. The teacher-directed instruction took place in the classroom; the computer-assisted instruction took place in the library media lab down the hall. If not receiving instruction, students were provided unrelated alternative material by the teacher to work on for the 15 minutes instead of participating in that day's treatment. Prior to beginning the study, the investigator provided instructional training to the pilot study teacher for both teacher-directed instruction and computer-assisted instruction.

The teacher took the human subjects training on-line before beginning classroom instruction for the treatment groups, as required by Kansas State University regulations. The investigator provided the teacher with all materials: Parental Consent Forms [Appendix A]; pretest/posttest scripts, lists, and maps [Appendix B]; teacher-directed script and materials [Appendix C]; computer-assisted script and materials [Appendix D]; control group timeline [Appendix E]; plus camera and tapes for videotaping. Instructional training was given to the teacher by the investigator for both methods. In particular, troubleshooting possibilities were discussed in relation to the on-line software program.

Two different types of instruction were compared during the pilot study [PS]. One classroom of fourth grade students, PS-Group 1, received teacher-directed instruction to learn the geographic place names, while the other classroom of fourth grade students, PS-Group 2, received the same geographic knowledge through computer-assisted instruction. There was not a control group during the pilot study. The state place names were presented to the students in alphabetical order.

On the first day, both groups of students took the 50 States pretest. The students were given two pieces of paper. One page had a numbered list of the 50 United States; the other page was a blackline map of the United States. The students were given directions to identify and label each of the 50 United States on their map by matching the place name with the map location and putting the corresponding number on the correct map location.

PS-Group 1 received teacher-directed instruction on the day following the 50 States pretest. Standing in front of the classroom, the teacher read from the script [Appendix C] and pointed to a 50 states map projected onto a screen from an overhead machine. She then said the state name, pointed to the corresponding place name on a large 3' x 5' wall chart, and repeated the state name. The students provided a choral response of the state name immediately after the teacher. This process was continued throughout the entire 15 minutes. The same process was continued throughout all instructional sessions. Each new instructional session began with the teacher quickly reviewing the places learned during the previous session, then additional place names from the list were added during the 15-minute session.

PS-Group 2 received computer-assisted instruction on the day following the 50 States pretest. On Day 2, the teacher led the students to the computer lab to receive computer-assisted instruction. The teacher provided introductory information on operating Click and Learn Software[c] [Appendix D], then students received additional information and instruction explaining the process via the computer. Each student worked independently on a single computer. On Day 3, the students took the 50 States Posttest.

On Day 4, both groups of students began treatment over 50 World Places by taking the pretest. Instructional procedures for teacher-directed and computer-assisted instruction remained the same as that for the instruction over 50 States. The only change was the content focus of materials, which was over 50 World Places. The instruction lasted one session for Group 1 and Group 2. Both groups of students took the 50 World Places Posttest on Day 6, which completed the pilot study treatments.

Pilot Study Data Analysis

Summarization of data statistics for pretests and posttests scores provided an idea of student knowledge gain over the brief time period. One-sample t-test data statistics were evaluated on each groups' pre- to post-test scores on both content sets to look at possible relationships [See Appendix H]. Student pretest and posttest scores are provided in tables. Table 1.4 (p. 27) shows pretest and posttest scores for the group who received teacher-directed instruction over the 50 States. The mean group score of 50 States for pretests was 34.89 and 38 on the posttests for teacher-directed instruction. Table 1.5 (p. 28) shows pretest and posttest scores for the group receiving computer-assisted instruction over the 50 States. The mean group score for computer-assisted instruction of 50 States was 34.5 on the pretest and 39 on the posttest.

The greater scores and gains over 50 States place names vocabulary suggested that the students had learned this content prior to the treatments. In a debriefing session following the pilot study, the classroom teacher expressed pleasure that her students demonstrated their knowledge of the 50 states through the pretest scores, as well as the posttest scores. The students had been studying the 50 states locations throughout the spring semester since the content was required in the school district curriculum.

Table 1.4: Data Analysis

Pilot Study, Group 1--50 States Scores

-- 50 STATES --

Teacher-directed instruction

n = 9

	PRETEST	POSTTEST	DIFFERENCES
	46	43	-3
	50	49	-1
	30	42	12
	42	47	5
	46	48	2
	48	49	1
	16	18	2
	31	40	9
	5	6	1
Total	314	342	
	$\bar{x}$ = 34.89	$\bar{x}$ = 38.0	

Note:

Group 1 had pretest to posttest scores mean gains from 34.89 to 38.0
Differences between pre- to post-test scores ranged from –3 to +12.

Table 1.5: Data Analysis

Pilot Study, Group 2--50 States Scores

-- 50 STATES --

Computer-assisted instruction

n = 6

	PRETEST	POSTTEST	DIFFERENCES
	17	12	-5
	46	50	4
	31	43	12
	30	34	4
	42	46	4
	41	49	8
Total	207	234	
	$\bar{x}$ = 34.5	$\bar{x}$ = 39.0	

Note:

Group 2 had pretest to posttest scores mean gains from 34.5 to 39.0
Differences between pre- to post-test scores ranged from –5 to +12.

Table 1.6 (p. 30) shows pretest and posttest scores for Group 1 who received teacher-directed instruction over the 50 world places. The teacher-directed instruction mean group score for 50 world places on pretests is 7.33 and on the posttests is 12.0. Table 1.7 (p. 31) shows pretest and posttest scores for Group 2 who received computer-assisted instruction over the 50 world place names vocabulary. The mean group score for computer-assisted instruction of 50 World Places on pretests is 9.33 and on the posttests is 18. The lower pretest scores, compared to the 50 States pretest scores, suggested that this was new content knowledge for the students, which the classroom teacher later confirmed. It is interesting to note the gains that were made in the group scores during only one 15-minute session for each type of instruction.

Graphs were created to depict comparison data on pretest and posttest scores for each content area. In Figure 1.1 (p. 32), pretest and posttest scores are shown for each 4^{th} grade student receiving teacher-directed instruction over the 50 States place names. Seven of the nine students scored over 50% on posttest scores. Seven out of nine students showed gains from the pretest to posttest scores. Pretest to posttest scores for computer-assisted instruction are reported in Figure 1.2 (p. 33). The Group 2 pre- and post-test scores increased in five out of six student score gains over the 50 States place names.

As seen in Figure 1.3 (p. 34), one 15-minute session reported gains from the pretest to posttest scores for eight out of nine students in Group 1. The ninth student received the same score on the pre- and post-tests. In Figure 1.4 (p. 35), computer-assisted instruction reported increased gains for six out of six students. Overall, despite the time constraints, students demonstrated gains through receiving both the computer-directed instruction and teacher-directed instruction within both content areas. The

Table 1.6: Data Analysis

Pilot Study, Group 1--50 World Places Scores

-- 50 WORLD PLACES --

Teacher-directed instruction

n = 9

	PRETEST	POSTTEST	DIFFERENCES
	3	12	9
	4	8	4
	9	13	4
	11	21	10
	8	13	5
	19	22	3
	4	4	0
	7	10	3
	1	5	4
Total	66	108	
	$\bar{x} = 7.33$	$\bar{x} = 12.0$	

Note:

Group 1 had pretest to posttest scores mean gains from 7.33 to 12.0
Differences between pre- to post-test scores ranged from 0 to +10.

Table 1.7: Data Analysis

Pilot Study, Group 2--50 World Places Scores

-- 50 WORLD PLACES --

Computer-assisted instruction

n = 6

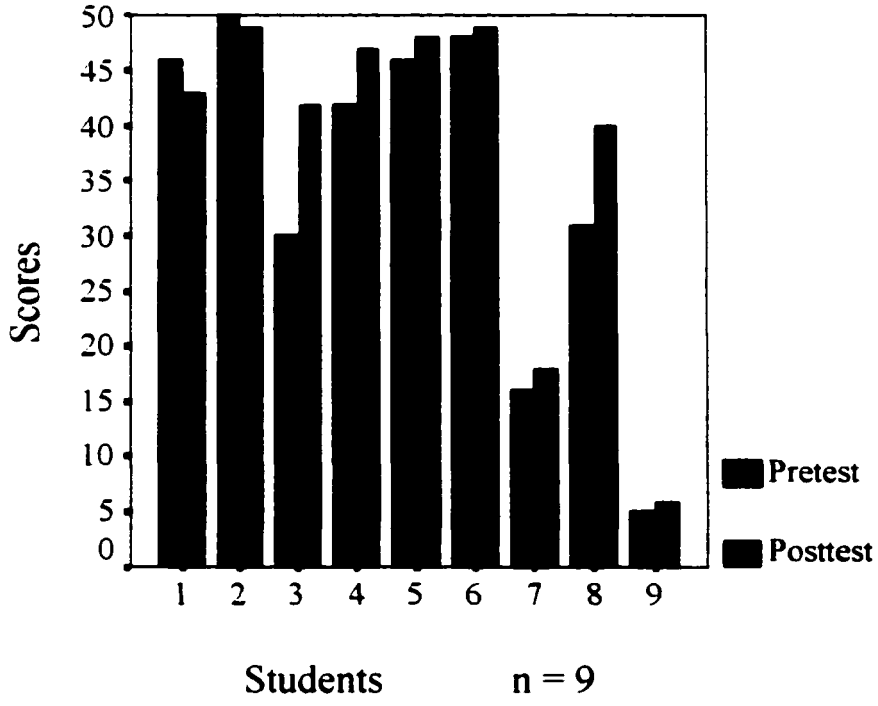
	PRETEST	POSTTEST	DIFFERENCES
	4	6	2
	17	26	9
	12	34	22
	3	6	3
	13	24	11
	7	12	5
Total	56	108	
	$\bar{x} = 9.33$	$\bar{x} = 18.0$	

Note:

Group 2 had pretest to posttest scores mean gains from 9.33 to 18.0
Differences between pre- to post-test scores ranged from +2 to +22.

Graph 1.1: 50 States

Group 1--Teacher-directed instruction

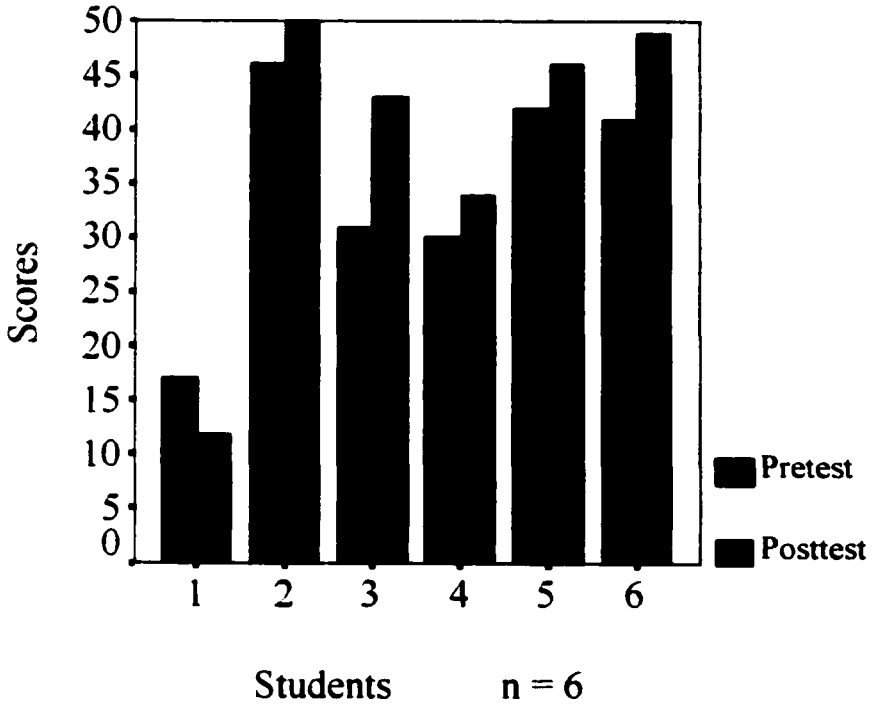


Note:

Graph reports pretest and posttest scores for each 4th grade student receiving teacher-directed instruction over 50 States place names.
Seven out of nine students scored over 50% on posttest scores.
Seven out of nine students showed gains on posttest scores.

Graph 1.2: 50 States

Group 2--Computer-assisted instruction



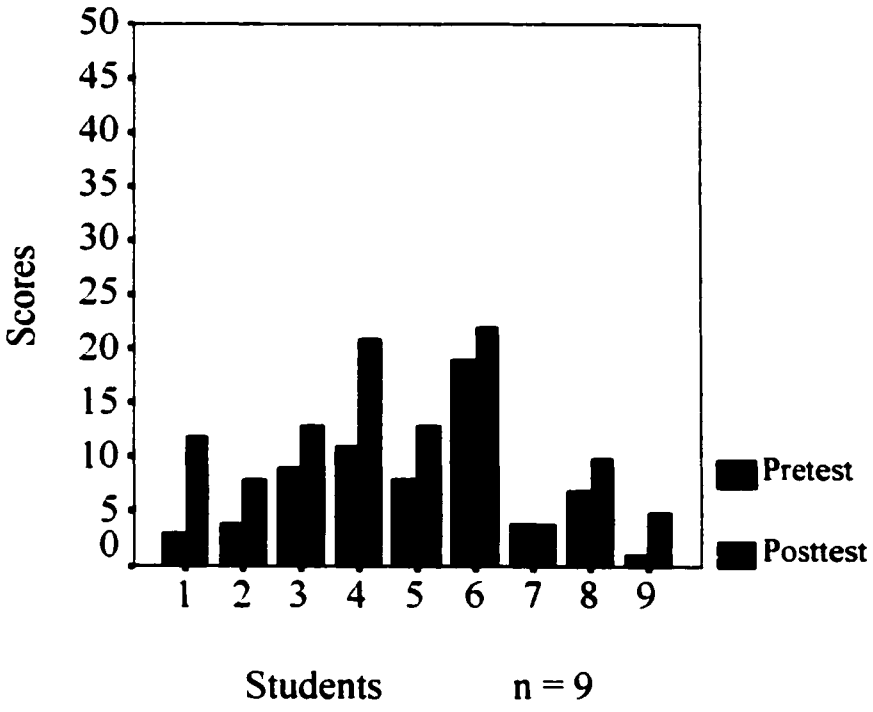
Note:

Graph reports pretest and posttest scores for each 4th grade student receiving computer-assisted instruction over 50 States place names.

Five of the six students scored greater on posttest scores than on the pretest student scores.

Graph 1.3: 50 World Places

Group 1--Teacher-directed instruction



Note:

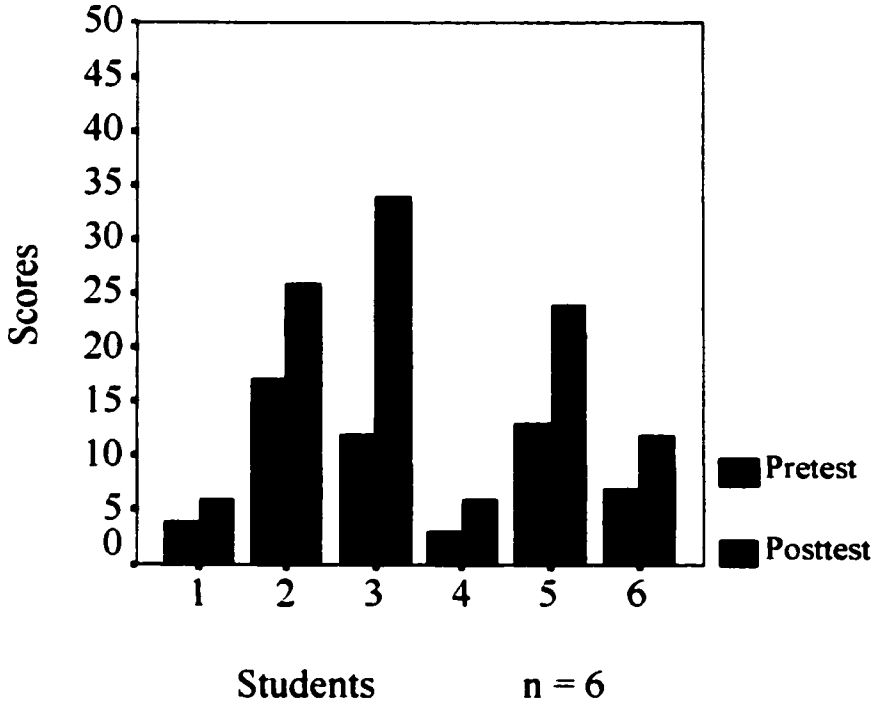
Graph reports pretest and posttest scores for each 4th grade student receiving teacher-directed instruction over 50 World place names.

No student scored at 50% or above on posttest scores.

Eight out of nine students scored greater on posttest scores than on the pretest scores.

Graph 1.4: 50 World Places

Group 2--Computer-assisted instruction



Note:

Graph reports pretest and posttest scores for each 4th grade student receiving computer-assisted instruction over 50 World place names.

All six students scored greater on their posttest scores than on the pretest scores.

small population in the pilot student prevents any generalization of data.

The probability of a Type I or Type II error occurring may decrease with a larger population in the study. A larger population may also determine whether the mean score would remain higher via computer-assisted instruction than through teacher-directed instruction. Indications from the data analysis implies that computer-directed instruction may be slightly more effective than teacher-directed instruction for teaching geographic place name geography, but more instructional time would be needed to provide additional evidence. A control group should be added to the study as a measure of instrument validity. Due to time constraints and the small population sample it is not advisable to generalize data to a larger population.

Study Modifications

After assessment of the treatments results, and based on recommendations from the classroom teacher, it became necessary to change certain elements of the instructions and materials. One unexpected event occurred during the teacher-directed instruction. After the first couple of times the teacher went through the treatment procedure, the students would read the place name with the teacher as she would read it from the chart. Every time the teacher tried to read the place name from the chart, the students preempted her speech by reading aloud the place name before the teacher could say it. The students gathered considerable enjoyment from their adaptation of the script.

Adjustments have been made to scripts and materials as recommended by the pilot study teacher. In the computer-assisted script, on-line screen copies were supplied to aid in clarifying the script. The both scripts were condensed to reflect the adjustment of

content taught during treatment. Further recommendations are as follows:

1. Instructional scripts for the computer-assisted instruction: Additional information should be written into the computer-assisted instruction scripts to provide explanation of all on-line screens involved with start-up procedures.
2. World maps [see Appendix B]: Distortions and errors exist that the cartographer attempted to remedy. The particularly distracting distortions were various country misconfigurations within the Mediterranean Sea region, which made it difficult for the students to identify Italy and Yugoslavia.
3. Labeling: Difficulties with labeling the world maps as a result of an inaccurate numbering system on the list caused confusion; world map features are extremely small and difficult to label; efforts were made to enlarge the world map further for ease in labeling.

Initially, there was a short questionnaire of three questions on the first pretest [Appendix B] to survey student opinions of computer use, amount of time computers are used daily, and attitude towards geography. The fourth graders responded inconsistently to these questions, especially concerning the time they spent on a computer daily. Their responses also demonstrated confusion with no answers for one, or sometimes two questions. It is unknown whether or not the confusion was the result of structural problems in the questions, inadequate directions on the teacher script, or another reason. It is questionable whether or not the questionnaire should remain on the pretest for the actual study.

Further evaluation of the data convinced the investigator that there is no point in assessing student knowledge of 50 states at the end of the school year. The low variance

of the pretest and posttest 50 states scores may be the result of semester- or year-long instruction over the content. By the end of the fourth grade school year, district curricular standards expect students to identify and locate the 50 United States and their capital cities. Classroom teachers have been providing instruction for meeting this standard throughout the academic year. The results of the classroom instruction may be evident in the higher pretest mean scores for the 50 States content. Geographic place name vocabulary of 50 world places will be the only content knowledge to be assessed during the research study.

Delimitations

The study will be restricted to one school district and one grade level, which may limit the generalizability of findings to be considered applicable to only subjects at that grade level and living in that specific district.

Limitations

The study considers whether or not students are learning the geographic content presented by teacher-directed or computer-assisted instruction. Time constraints and lack of prior geographic knowledge may limit acquisition of the specific concepts that will be presented quickly (during 15 minutes of daily treatment).

Teachers providing the classroom instruction may unintentionally supply additional geographic content to students throughout the day in relation to other disciplines and materials. Care was taken to dialogue with teachers concerning extra information that may not be provided to students during the study, but this may not be

totally eliminated from daily instruction, especially if the teachers teach integrated curriculum.

A possible limitation of the Pilot Study was the result of the same teacher providing both types of instruction to two classes of students. Some carry over instructional characteristics may have existed from class to class, but since the actual instruction was time restricted, the teacher may not have had time to become familiar enough with the instructional deliveries to impact the methodology.

Definition of Terms

Key term definitions are included in an attempt to clarify meanings and usage of terms as applied within this study:

Computer-assisted instruction: One type of application using a computer as a tutor; consists of software programs designed for individual practice of a specific skills; programs provide educational games, simulations, and tutorials for practice and drill of content to be learned by students (Kellough, et. al., 2001).

Teacher-directed instruction: A highly organized instructional approach emphasizing distinct student goals, extensive content coverage, and consistent monitoring of student performance within adequate and constant time frames, while supplying immediate feedback to students (Ellis & Fouts, 1997).

Geographic place name vocabulary: Terms used for identification of a natural or geopolitical feature found on Earth's surface; involves identification,

representation, and location of the feature upon a map or globe (Smith, 1986).

Chapter 2

LITERATURE REVIEW

An extensive search of literature spanning over sixty years produced a vast amount of information relative to this study, though few sources were found relative to the elementary level. Historically, geographic place name vocabulary was identified as an important addition for insuring a solid knowledge base, geographic literacy and responsible citizenship in a global society (Saveland, 1980). A limited amount of teacher-directed instruction literature includes practice strategies utilized in elementary classrooms to teach geographic place name vocabulary. Specific characteristics of teacher-directed instruction, and similar instructional topics were identified in the literature to explore issues of computer-assisted instruction in the classroom. While there exists a multitude of literature relative to the two treatments employed in this study, the largest portion appears to be is limited to reading and math instruction instead of geography, or social studies, which are the disciplines targeted in this study.

Resources

Sources examined during the search include topic-related journal articles, books, and dissertations. Standard reference sources involved in the literature review within the Educational Resources Information Center database (ERIC) print sources include: Resources in Education ERIC Documents and Current Index to Journals in Education; WorldCat lists; PapersFirst; Dissertation Abstracts; as well as research in geography education, such as A Bibliography of Geographical Education, 1970-1997 (Foskett & Marsden, 2001).

Terms related to, or derivatives of, the basic topics covered through the search include: computer-assisted instruction, teacher-directed instruction, and geographic place name vocabulary. There were a number of documents for each topic, yet most were not applicable to this study. In an effort to find more specific, related information on individual topics, the basic terms involved in the search were shortened, expanded, and combined with other associated terms.

The search variations are mentioned in this chapter since the wording of a search exploration vastly affected the results of the search. It was beneficial to rearrange the order of words, since during the search process an unknown and relevant document would appear whenever the order of words switched. For instance, placing geography before computer-assisted instruction in an advanced search targeted a different set of documents than were found when computer-assisted instruction was written before geography. Specific authors identified within a number of documents led to further research within similar topics. For instance, teacher-directed instruction documents related to the study were often embedded within specific topics, rather than through the original search.

A valuable resource of geographic educational resources was the document: A Bibliography of Geographical Education, 1970-1997 (Foskett & Marsden, 2001). Foskett and Marsden wrote the book on behalf of the Geographical Association in 2000, in an effort to update a previous volume on documents that had been written in the United Kingdom. Their efforts include an international perspective in the bibliography, since the authors included in this volume many English-based materials from the United States and Australia along with documents generated from the United Kingdom. The resources

covered topics that relate to this study in various sections. There were resources identifying geographic instructional methodology, geography-related research, and justifying geography education.

A Search for Defined Terms:

In an on-line Internet search of WorldCat for 'computer-assisted instruction', 33329 entries were found. Narrowing the search to 'geography', 364 records were listed, and only 35 pieces of literature were identified when 'elementary' was the focus. WorldCat searches include books, computer programs, visual aids (videos and other images), serial documents, audio sound recordings, Internet sources, musical scores, limited archival documents, and articles. The WorldCat search provided more record lists than an on-line ERIC search of computer-assisted instruction, which listed only 4165 documents. The ERIC search provided 218 documents on 'geography' and 'computer-assisted instruction' combined topics, yet when the search was narrowed to include 'elementary' only 83 documents were listed. Exploring further with the advanced search, an addition of the term 'drill' limited the documents to 6, and substituting 'practice' for 'drill' targeted 11 of the records. Then, in an effort to expand the search, it was found that placing 'geography' before 'computer-assisted instruction' targeted a different set of 37 documents than were found when 'computer-assisted instruction' was written before the term 'geography'. And adding 'elementary' to the advanced search limited the documents to 12.

Approximately 150 other computer-assisted instruction documents were found embedded in literature during searches for teacher-assisted instruction. Some of these documents compared computer-assisted instruction to teacher-directed instruction. Other

documents identified computer-assisted instruction as a type of teacher-directed instruction depending on lesson objectives and similar instructional characteristics.

The search for information on the defined term, 'teacher-directed instruction', took several directions. An on-line ERIC request for documents pertaining to 'teacher directed instruction' resulted in 1,593 entries without the hyphen, and 320 with the hyphen. The search in WorldCat for 'teacher directed instruction' without the hyphen listed 184 documents. Narrowing the search to 'geography' or 'geographic' within the 'teacher directed instruction' produced no listings. Two documents were listed when substituting 'social studies' for 'geography'. In an effort to find additional related literature, a hyphen was placed between 'teacher' and 'directed', which changed the type and amount of entries.

In each decade a new term was discovered as a derivation of the defined term, 'teacher-assisted instruction,' yet they will not be discussed in this document. Instead, it is important to supply a short list of word derivations, or substituted terms, that were found useful when attempting to expand the ERIC search. The short list is a mixture of word combinations that may or may not have a similar definition, including: teacher instruction (directed) [1587], direct instruction [4395], direct teaching [4085], directive teaching [235], and teacher centered instruction [1825]. Searches were narrowed for all of the aforementioned terms using 'geography' or 'social studies' which limited the search to between 7 and 49 entries, depending on the combination of terms. These entries were further limited when focusing the same topics within literature aimed at the elementary grade level.

A search was also conducted for literature specifically connecting or comparing 'teacher-directed instruction' and 'computer-assisted instruction'. One hundred ERIC documents were listed, yet, of that total only 31 were related to elementary grade levels. Two of the 31 documents contained references to 'drill'; three other documents referred to 'social studies' or 'geography' concepts; and the rest pertained to either to general knowledge, reading literacy, or math skills.

Of all the literature found containing teacher-directed instruction concepts, only a small fraction was directly related to this study. The bulk of the literature pertains to using drill during reading and mathematics instruction, with additional connections in documents focused on topics such as English as a second language, special education, spelling, and science. In the literature, successful examples of 'teacher-directed instruction', more often than not, emphasized reading or math activities.

Initially, the bulk of the search for documents containing 'teacher-directed instruction' were discussing, debating, or evaluating the instructional model, Direct Instruction (DI), which includes a complex model of specific teacher-directed instructional sequences and techniques (Education Commission of the States, 1999). The DI Model characteristics are related, in general, to teacher-directed instruction since both emphasize students learning basic reading and math skills within structured and directly applied instruction supplied by a teacher, yet they differ in other features, such as task analysis (Stein, Carnine, & Dixon, 1998). Unless directly referred to as an example, the DI Model is not an element of the current study.

It may be important and appropriate to peruse the documents related to general characteristics of teaching processes instead of those directly connected to specific

concepts at a particular grade level (Gage, 1979), yet this investigator considers it necessary to explain relationships within the social studies content to the term 'geographic place name vocabulary'. A search for documents related to geographic place name vocabulary was extensive and complicated, even confusing, since some items were found through searches using combinations of the four words of the defined term, 'geographic place name vocabulary'.

The search for documents containing 'geographic place name vocabulary' took a variety of paths. As a specific term for this study, 'geographic place name vocabulary' provided only two documents through an on-line search with ERIC, and none were listed from WorldCat. In order to differentiate between search possibilities it was necessary to identify documents that may be related to definition of the entire term, 'geographic place name vocabulary,' but were found during a search through a derivation of the term. It was necessary to keep in mind the definition provided in Chapter 1: geographic place name vocabulary is utilized for pinpointing a natural or geopolitical feature found on Earth's surface as it involves identification, representation, and location of the feature upon a map or globe (Smith, 1986).

In an effort to find as many documents as possible related to the definition the four-word term, 'geographic place name vocabulary', was separated and reordered during the literature search. Term configurations included: 'place name,' 'place' or 'name,' 'geographic place name,' 'place name geography,' 'vocabulary geography,' 'place name vocabulary,' 'place name geographic vocabulary,' 'place name geography instruction,' and 'place name geography teaching.'

Multiple meanings for the word, 'place', led to a variety of entries during the literature search. The entry was for 'place' as an identifiable location, instead the documents provided information about a specific place, a study of name geography (Zelinsky, 1997), regional information, place perspectives, toponymic patterns (Gulley, 1995), placename connections (Katz, 1995), or place naming practices (Holland, 1995), which were not useful materials for this study. The 'place name" search in ERIC provided 30 entries, while the search for 'place' and 'name' resulted in 338 entries. The WorldCat search requested information from 367 documents for 'place name.'

Another derivation in the place name search, found in WilsonSelect, was the topic of 'place location knowledge.' Torrens (2001) provided insight into the importance of place location knowledge to the geographer as foundational knowledge of the discipline itself, as well as to understand the human and environmental processes at work. He also addressed geography at a more practical level, in everyday life. He encouraged individual citizens to take the responsibility to gain understanding of global economics, climatic events, political issues, and individual decisions through geographic place location knowledge.

A search for 'place name vocabulary' only supplied one entry in ERIC about whether place vocabulary is taught through textbooks (Smith & Larkins, 1988). There was only one entry for 'place name vocabulary' in WorldCat, and it was unrelated to this study (Damico & Olsen, 1990). These were the same two documents listed for 'geographic place name vocabulary'.

In WorldCat, the search for 'place name geography' provided 33 entries. The search for 'place name geographic' in ERIC supplied 14 documents, while another search

in ERIC for 'geographic place name' gave 41 entries. The ERIC documents wove the 14 documents into the 41 documents search list. The majority of the documents pertained to marketing research, academic planning, study guides, and locational studies that did not relate to instruction. On the other hand, four of the documents were connected to the study through geographic instruction of place names and methodology.

A search for 'vocabulary and geographic' supplied 79 documents through ERIC, while a search for 'vocabulary and geography' supplied 161 documents. A WorldCat search for 'vocabulary and geography' provided 182 entries. The requested information from a search of 'place name and geography instruction' through ERIC identified 24 documents. This appears to have exhausted the supply of identified documents.

Knowledge-based Instruction

In the latter part of the twentieth century there was a surge of research attempting to explain and understand the social nature of learning. "Students need to be provided with a basic body of knowledge that will form the foundation for future discoveries" (Fredericks, 2000, p. 4). Common and fundamental information enable people to communicate more efficiently with each other and are better prepared to work in a global society. There are numerous cognitive frameworks available for identifying knowledge levels, or steps of learning (Bloom, Englehart, Furst, Hill, Krathwohl, 1956; Eggen & Kauchak, 1996; Anderson & Krathwohl, 2001).

One goal of education is to encourage all citizens to build a common base of knowledge. To support the idea that students develop their own understanding, the literature clarifies amateur and expert understanding, knowledge of higher-order thinking, and differences of thinking and problem solving (Eggen & Kauchak, 1996). In an attempt

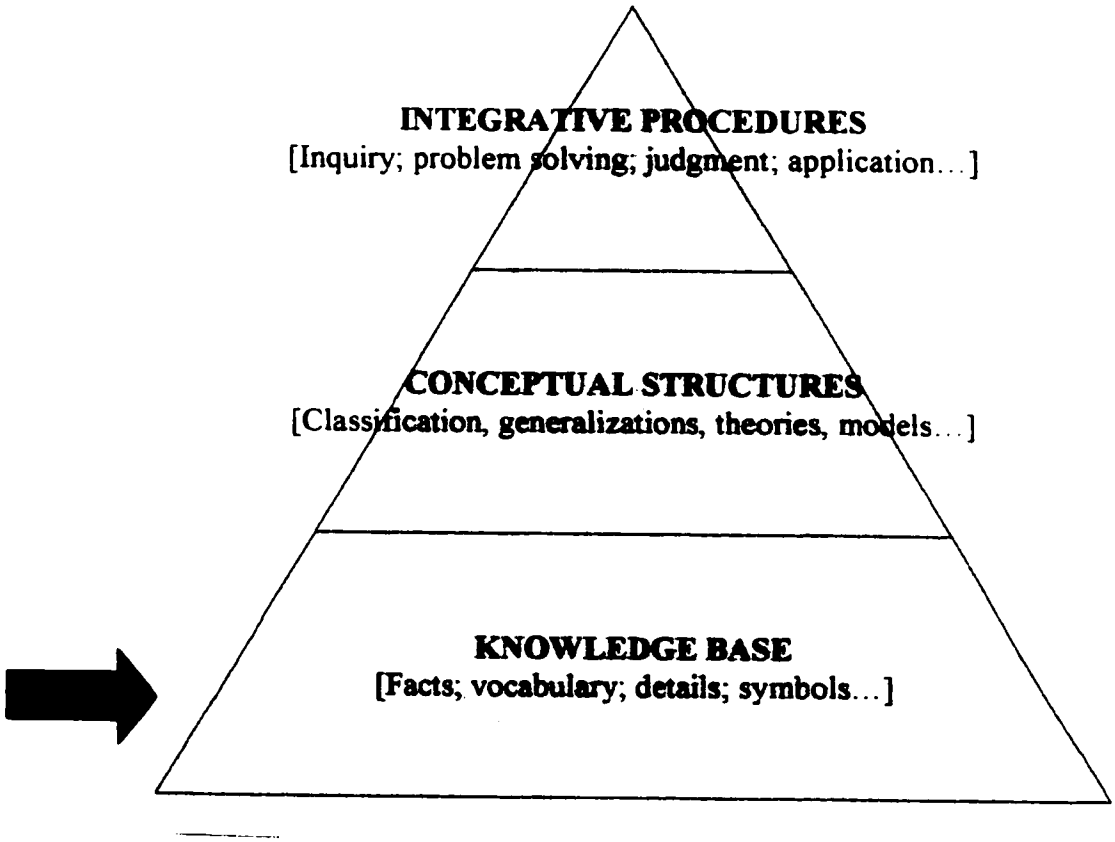
to identify accepted educational guidelines for this study, a combination of ideas and levels were combined to form what this investigator believes is a framework of learning.

Foundational knowledge, in the opinion of this investigator, consists of three interrelated base sections: the knowledge base sector, the conceptual structures sector, and the integrative procedures sector (Table 2.1, p.50). The top integrative procedures sector is built on conceptual structures that are formed from a large, common knowledge base.

The knowledge base sector is built on the foundation of information each individual accumulates from birth throughout life. In the knowledge base sector, individuals acquire information, such as facts, vocabulary, details, symbols, and other pieces of information of people, places, or things within a spatial perspective. It is an attempt to build knowledge structures or a spatial representation of how humans fit into an environment (Golledge, 1999). At the knowledge base, a learner easily assesses and immediately retrieves information for identification, manipulation, classification, and connection with other informational pieces, or groups. Individuals are continuously rebuilding, reshuffling, retrieving, and reevaluating the stored foundational knowledge information.

The conceptual structures sector reconfigures pieces of information pulled from the base sector to form relationships that enable individuals to clarify communication, form connections, and reorganize informational groups. At this knowledge sector, the concepts surrounding identification of facts and their relationships aids in understanding and developing language skills. In the middle sector, conceptual structures classify information, demonstrate models, and generalize theories.

Chart 2.1: Knowledge-based Instruction Pyramid



Note:

The pyramid of knowledge-based instruction contains three major areas for building a learning foundation.
The knowledge base level is when a learner remembers facts, vocabulary, details, symbols, etc.
The conceptual structures level is developed when basic knowledge is connected during such activities as classification, generalization, developing theories, and constructing models.
The integrative procedures level is reached when the learner uses basic knowledge with conceptual structures to develop more elaborate thought processes, such as inquiry, problem solving, application, and judgment.

If all learning were done in isolated facts, then there would be no need for conceptual structures, which unite cognitive processes with knowledge. Humans usually do perform tasks, which, depending on the context, involve more than one type of knowledge. Dependent on the nature of the cognitive process, conceptual structures build working relationships between bits of information. "A focus on meaningful learning is consistent with the view of learning as knowledge construction, in which students seek to make sense of their experiences" (Anderson & Krathwohl, 2001, p. 65).

Topping off the foundational knowledge base, the integrative procedures sector includes the integrative procedures involved in evaluation and investigation, interconnecting problem solving strategies with spatial perspectives to question, reassess, and judge separate or clustered information. Anderson and Krathwohl (2001) developed categories of knowledge and cognitive processes, and explained procedural knowledge as a process of knowing how to use techniques and methods in conjunction with knowledge and skills.

The focus of this study is to understand the impact of computer-assisted instruction and teacher-directed instruction as an individual's basic knowledge develops through the identification and location of geographic place name vocabulary. The importance and satisfaction of learning facts has become jaded in the literature. Authors consider arbitrarily assigned fact knowledge and memorization to be boring and unnecessary. "A fact is an arbitrary association between two objects. . . Learning a fact requires only the memorization and recall of the fact" (Kemp, Morrison, & Ross, 1994, p. 60). Yet, one never knows when an isolated piece of information will be useful, or

whether or not the subconscious remembers a fact that may not have had impact a distant moment ago, but is necessary for the moment.

Golledge (1999) states that cognitive information can be acquired, encoded, stored, decoded, and utilized for spatial reference. In the cognitive mapping process, internal representations may be fragmented, incomplete, or distorted in such a way that an individual may not exhibit knowing all the facts, yet be successful in finding the way to a specific location (Golledge, 1999). Foundational knowledge may have been impacted through the conceptual structures to compensate for misinformation. "The fact is, however, that a knowledge of place is not simple rote and is linked with perception and spatial conceptualization, which are *au courant* and respectable fields of geographic research" (Saveland, 1980, p. 3).

In the latter decades of the 20th century, research has emphasized the importance of cognitive processes in education. Most research considers meaningful knowledge important, yet stresses, and attempts to define "meaningful knowledge." Promoting instruction of topics directly from the child's world, such as television and video games, prevents instruction from being considered inert. "Although subject matter knowledge is important, inappropriate emphasis on factual information can have devastating effects on both teacher and student growth" (Riner, 2000, p. 55).

Why Geography?

People of all ages want to understand their world; they want to gain information and a spatial perspective about the environment in which they live and interact in order to make sense of that world (GESP, 1994; Morris, 1968; Parker, 2001). The relationship of geography to language and the collection of factual information at the knowledge base,

allows the learner to further develop personal knowledge and understanding required for higher level thinking. Eventually, personal knowledge expands beyond the 'what' and 'where' questions to find answers for 'why' and 'how.' "In geography, knowledge *of* space represents the accumulation of facts about the spatial arrangement and interactions comprising human-environment relations and recognition of fundamental concepts—i.e. the declarative base of geographic knowledge" (Golledge, 2002, p. 1). An increasing recognition of the difference between collecting geographic facts to understanding the processes involved in conceptualizing and evaluating the spatial patterns of facts has occurred during the last half of the 20th Century, emphasizing the importance of all types of geographic thought (Golledge, 2002).

There continues to be a demand for research related to geographic concepts and skills (Leib, 2000), and after an extensive search for literature it is obvious the research should cover elementary grade levels. Since the 1980s, the geography education research agenda has been channeled towards educational reforms that meet the needs of students in a constantly changing and global society (GESP, 1994; Gregg, 1997). In an elementary social studies curriculum, geography is considered the discipline to provide instruction covering specific place, regional, and cultural information.

During the past 25 years, professional geography organizations have set goals and standards to represent the most recent documentation for clarifying and promoting the role of geographical education in United States schools (GESP, 1994; NCSS, 1994; Page, 1994). Students are expected to receive specific geographic instruction at the elementary grade level so students will gain the knowledge and skills they need to be responsible and active citizens of the 21st Century (NCSS, 1994). Attitudes for increased geographic

education in the schools are traced to concerns related to global economic competitiveness, and the apparent geographic illiteracy displayed by United States adults in the last twenty-five years (Rediscovering Geography Committee, Board on Earth Sciences and Resources, Commission on Geosciences, Environment, and Resources, & National Research Council, 1997).

In the overall plan of current education reform in the United States, reading literacy and increased skills in mathematics are the focus. Initiatives supporting back-to-the-basics skills emphasize reading instructional in phonetics, language acquisition, and reading literary. The development of math literacy encourages instruction in problem solving, inquiry, and the rote memorization of facts. There is value in rejuvenating instruction of basic skills, yet these skills should include geographic concepts. Geography, as well as other disciplines, has been identified as a core subject to be taught in American schools in the Goals 2000: The Educate America Act and is well supported by national geographic organizations (GESP, 1994; National Education Goals Panel, 2000; Rediscovering Geography Committee, et. al., 1997).

Reinhartz and Reinhartz (1990) have found that geography is usually not taught as a separate discipline in the K-6 curriculum in many states. Geography content is often only integrated or embedded into other curricular disciplines. Yet students are expected to use a variety of information skills and concepts within a specific topic that connects a subject to geography (Page, 1994). "Geography's heavy dependence on map graphics, illustrations, charts, photographs, and video offers teachers rich opportunities to integrate challenging and exciting teaching techniques at all grade levels" (Svingen, 1994, p. 180).

Twenty-five of the PapersFirst documents were connected to this study either through improving student knowledge of geographic concepts and skills, discussing standards-based education, or discussing the role of technology in geography education.

Geographic place name vocabulary

Teachers have the unique opportunity of providing instruction to expand student vocabulary through the social studies curriculum. Vocabulary may be expanded through explorations of word meanings and relationships to words learned in previous learning experiences. Content-related books, textbooks, maps, and various other materials are avenues for instruction to facilitate vocabulary acquisition (Irvin, et. al., 1995). Vocabulary knowledge may be identified through an expansive variety of words and their meanings or through concept development of word relationships. Like other forms of vocabulary, place vocabulary is associated with symbolic meanings: verbal, written, thought, or expression.

Place is a term of multiple meanings. In fact, the Merriam-Webster Dictionary (1998) provides ten meanings for the term, often substituting multi-meaning terms within the definition. For instance, the first meaning lists 'space', then 'room'; both terms are broadly based. With the exception of placing at a horse race, terms used within all the meanings, from 'open space' to a 'public square,' related in some way to thinking with geographic perspective.

People name places in an attempt to make sense of their world. They identify a place in a desire to distinguish one place from another, or in an effort to describe one place from another, or for a variety of other reasons (Stewart, 1954). Place names, as any type of geographic feature, are onomastic items that have a definite locus and can be

pinpointed on a map by coordinates" (Nicolaisen, 1984, p. 359). Basically, the reason for giving a place a name is to identify, refer to, and indicate a specific place when communicating with others (Cassidy, 1984). Payne (1995) explains:

> "Geographic names are initially connotative; however, in the course of their development they become denotative, labels which serve as referents to specific landmarks within a spatially defined area" (p. 307).

In 1890, the United States Board on Geographic Names was created in an attempt to standardize geographic names as they are used in federal documents and maps. Standardization, or a common knowledge of place names, was seen as important since the application of different names to the same geographic feature on the increasing volume of maps and documents created for the government caused much confusion (Payne, 2000). The relationship of geography and language is both challenging and complicated whether an individual is traveling or working at a set location plotting vacation spots of known locations from topographic maps (Burrill, 1991). The importance of identifying, classifying, and understanding place names relates to the understanding of language and its interface with geography (Barry, 1995). This process has been revolutionized with the advent of the computer, which has the capacity to store and manipulate huge quantities of data (McArthur,1995).

A major goal in geographic education is the development of a sense of place and space. The concept of place is a central theme in the discipline of geography, and is closely associated with location (Martorella & Beal, 1994). Far beyond the association of rote memorization, place knowledge is linked with geographic perception and spatial

conceptualization (Saveland, 1980). "Place discovery is the first axiom of the Geographic Imperative" (Salter, 1995, p. 472).

Classroom instruction aids students to develop a sense of place as they discover links between vocabulary knowledge and maps. Relationships of points, or places, are important elements for understanding the concept of region and building spatial competence. A sense of place is developed by identifying points on a mental map as individuals attempt to understand their world (Kitchin & Fotheringham, 1997; Vuicich, Stoltman, & Boehm, 1988). "The location of places is usually identified using a global, local, or relational frame of reference [and] called 'absolute' location" (Golledge, 1999, p. 11). The associations of points as places and their location on a map are the content focus of this study.

Research identifies some studies, which focus on the importance of geographic place name vocabulary. Saveland (1980, p. 3) explains:

> The term *place vocabulary* is not one in common use, an indication of the small amount of attention given the subject. Out of favor as an educational strategy for [more than] a generation, place knowledge is often considered simple rote, the use of repetition and memorization.

A world-wide study titled the Place Vocabulary Research Project undertook to identify student knowledge of 50 world places under the direction of Saveland (1980). During the global investigation, the attempt was made to identify and determine what common knowledge constitutes a functional place vocabulary that all citizens around the earth should possess. Fourteen countries were involved in the study, so every effort was made to avoid cultural biases of place names within the assessment. A list of fifty world

places was developed to include a selection of countries, oceans, major cities, and seas. The main part of the test focused on countries, yet of the 153 possibilities considered to be worth knowing, the choice was narrowed to include countries over four million in population and 500,00 square mile (1,295,000 km^2) of area so it would be visible on a small scale world map (Saveland, 1980). The test assessed basic world knowledge of place, and the performance ranges varied from country to country. Overall, teachers and the public were surprised at the poor ranking of students as seen through the test results. Saveland stated that the project results indicate that more time should be spent on instruction in place knowledge and vocabulary development.

Smith (1986) conducted a study in reply to Saveland's call for further research into the instruction of place knowledge and vocabulary development. Smith identifies place vocabulary as a skill central to developing citizenship literacy. The question as to how to best teach geographic place vocabulary was the focus of Smith's study. Eighth-grade students were taught the same 50 world place names that were utilized in the Saveland (1980) project and the 50 United States place names. Treatments in the Smith study were drill and a variety of methods for activity instruction. A method of teacher-directed instruction, drill instruction, produced significantly greater posttest mean averages, even in the delayed posttest results when teaching 50 world places and 50 states.

There exists a binding relationship between vocabulary knowledge and academic achievement. Students demonstrate increased achievement as they participate in literacy learning, acquiring and practicing communication skills during integrated language arts and social studies activities. Language arts, as a discipline, encompass a continuum of

communication skills from "listening, speaking, reading, writing, viewing, visual presenting, and thinking" (Farris, 2001, p. 39). Integration of literacy learning elements and social studies concepts, such as geographic concepts, promotes word comprehension, verbal aptitude, and an expanded vocabulary (Irvin, et. al., 1995). Location of place influences individual interpretation and comprehension of current events, historical events, cultural issues, politics, and other physical and human factors (Smith, 1986).

Educators in the United States have not been encouraged to teach geographic place vocabulary. Location of place, geographic perspectives, and social studies concepts have been designated by many educators, as dull and boring curriculum areas (Bednarz, 1995; Cornbleth, 2002). This indicates a complete lack of understanding of the importance of place identification and its relationship to building mental maps or developing an understanding of why events occur throughout the world. Some educators feel that teaching place geography "is a first step upon which all further geographic learning takes place" (Bednarz, 1995, p. 330). Geographic place name vocabulary is more than isolated facts; they can be combined to create spatial and ecological perspectives to explain distribution of physical and human phenomena across the earth (GESP, 1994).

Maps

The value of maps is apparent as humans travel from one place to another. Sometimes a person knows the absolute location they are going to, yet at other times a person will only be able to state the relative location of the place. Golledge (1999) states that maps have two basic purposes: 1.) to encode known and remembered information about a place, and 2.) to assist in wayfinding. Both purposes require that a person

participate in building a mental map of the environment. Efforts to create a mental map are dependent upon the individual's personal spatial perspectives of the environment and its actual correspondence to a place on a map (Allen, 1999).

There are rules and conventions for creating maps, and these principles should be taught the early school years. Maxim (1997) promotes instruction in basic map skills for increasing geographic understanding as an important addition to elementary grades curriculum. Real experiences can be transformed and supported by classroom instruction in elementary grade levels through activities that update common, basic knowledge and substantiate mapping skills (Wood, 1992). Fuson (1966) states that "location is to geography as date is to history or alphabet to written language" (p. x). Basic map instruction should focus on building foundational knowledge about the world.

Maps are representations of knowledge and serve as collection documents (Golledge, 1999). Maps of the mind are known as cognitive maps, or mental maps. "They are really the ultimate maps, because they're the ones you use to make decisions about the environment" (Muehrcke, Muehrcke, & Kimerling, 2001, p. 4). Mental maps are individually constructed of a variety of images based on prior and current experiences, yet all people have internal maps that share common representations of the world (Chiodo, 1993). The same study Chiodo conducted with preservice college-aged teachers for developing mental maps was also conducted with seventh grade students. Little difference in mental-map-drawing ability was seen between the two age groups, except between older individuals who had taken more than one higher education geography course.

Literature revealed many lesson plans for teaching primary-aged children how to use maps (Melahn, 1989; Blaut, 1999), create maps or globes (Gustafson & Meagher, 1991; Martin, 1989; Pritchard, 1989), read maps (Leinhardt, Stainton, & Bausmith, 1998), and other geographic concepts (Schoenfeldt, 2001). Leinhardt, Stainton, and Bausmith (1998) found that children learn how to read and interpret maps by creating them, locating place names, and working collaboratively as they practiced using geographic skills in meaningful learning experiences. Various types of instructional strategies throughout this type of literature focus on the importance of understanding how and when young students learn geographic concepts. In particular, Schoenfeldt (2001) stressed the importance of encouraging children's emergent spatial skills in understanding large-scale and small-scale environments, as well as their ability to create and use maps.

Castner (1999) provides a taxonomy of maps. Some maps examine relative location of events, or places, as single points. Viewing an "unlabeled point symbol inventory map," an individual may generalize information from the map about distribution of the points. Further analysis may lead the individual to perceive distinct features, patterns, and connectivity. Ultimately, through the taxonomy, Castner suggests that mapping experiences should be introduced to children (no age was provided) through large-scale maps, wayfinding tasks, and relative location contexts.

As spatial representations of the earth, maps are a fundamental part of geography (Leinhardt, Stainton, & Bausmith, 1998; Wood, 1992). A map, defined as a spatial representation, stands for the environment or Earth, as well as for any likeness or simplified model that portrays its image or through patterns (Alderman & Good, 1996;

Muehrcke, Muehrcke, & Kimerling, 2001). "A map can carry in its image such symbolism as may be associated with the particular area, geographical feature, city, or place which it represents" (Laxton, 2001, p. 54).

Teacher-directed instruction

The choice of instructional method is important when teaching students strategies for efficiently acquiring and retrieving meaningful facts, as well as for improving overall student academic achievement. Student achievement has been found to directly correlate to the structured instruction. Highly structured and well-focused instruction corresponds to increased student academic achievement, especially with at-risk students (Izumi, 2001).

This study looked for research referring to characteristics of teacher-directed instruction characteristics as stated in the definition of terms. Ellis and Fouts (1997) defined teacher-directed instruction, in general, as a highly organized instructional approach emphasizing distinct student goals, extensive content coverage, and consistent monitoring of student performance within adequate and constant time frames, while supplying immediate feedback to students. Teacher-directed instruction incorporates sequentially structured and academically focused teaching materials. The teacher-directed instruction described within the definition refers to the highly organized, linearly structured, and task-oriented approach identified by Barak Rosenshine and others (Ellis & Fouts, 1997). Rosenshine (1979) outlines direct instruction as occurring in:

> "academically focused, teacher-directed classrooms using sequenced and structured materials. . . [with] teaching activities where goals are clear to students, time allocated for instruction is sufficient and

> continuous, coverage of content is extensive, the performance of students is monitored questions are at a low cognitive level so that students can produce many correct responses, and feedback to students is immediate and academically oriented...the teacher controls instructional goals, chooses materials appropriate for the student's ability, and paces the instructional episode" (Rosenshine, 1979, p. 38).

A wide range of instructional strategies has been identified under the umbrella of teacher-directed instruction. Lecture, teacher-led discussion, textbooks, and teacher-led question/answer sessions are representative of the multitude of teacher-centered instructional opportunities found in the classroom (Freiberg & Driscoll, 1996; Izumi, 2001; Stein, Carnine, & Dixon, 1998). Peterson (1979) quoted Anderson's 1959 opinion on teaching methodology research as a reminder that a wide variety of activities have been identified repeatedly as teacher-led.

A search of teacher-directed instruction research often becomes confusing since a variety of terms are representative of the teaching technique. Whether the term used is teacher-centered (Chall, 2000; Gage, 1985), directive teaching, direct teaching, direct instruction (Peterson, 1979; Rosenshine, 1979), or teacher-directed instruction, the unifying element is that the instructional procedures in the classroom are lead by a teacher. The teacher directs any instructional procedure by organizing lesson objectives around what content/skills are to be learned, the conditions under which the content/skills are learned, carefully orchestrates the chosen sequential instruction, and monitors student learning progress (Ellis & Fouts, 1997; Rosenshine, 1979).

Carefully planned lessons should be developed to emphasize specific content knowledge and skills for each subject through direct instruction (Izumi & Coburn, 2001, p. 23). Key elements of direct instruction provide students with a learning structure that identifies what is to be learned and how it should be learned (Chapin & Messick, 2002). Good and Brophy (1986) adopted specific criteria for classroom instruction, focusing on the teacher as an important instructional vehicle while evaluating teacher behaviors, attitudes, and interactions with students.

A further look at the literature provides support for teacher-directed instruction since it "has been shown to be one of the most effective teaching methodologies when compared to other methods" (Izumi & Coburn, 2001, p. 23). A traditional approach to instruction involving teacher-centered instruction leads to improved student academic achievement and "generally produced higher academic achievement than the progressive, student-centered approach" (Chall, 2000, p. 171). Gage (1985) discussed classroom instruction procedures through a definition of teacher-centered instruction suggested by Cuban [in 1984]:

> By 'teacher-centered instruction,' Cuban provides some characteristics of classroom teaching, such as when:
>
> --Teacher talk exceeds student talk during instructional time.
>
> --Instruction occurs frequently with the whole class, but less frequently with small-group or individual instruction.
>
> --Teacher determines use of class time.
>
> --Classroom arrangement is plotted into desk rows facing a blackboard with a teacher's desk nearby.

Direct instruction has played an important part in increased student academic achievement when distributing a large amount of information, skills, and concepts (Smith, 1994). Chall (2000) stresses the importance of expository instruction in a teacher-centered classroom, since a strong social studies knowledge base "leads to better integration and the ability to make inferences" (p. 77). Yet only a small amount of research exists to explain how teacher-centered or student-centered activities impact social studies instruction (Chall, 2000).

Not all research related to teacher-directed instruction is positive. Many educators consider teacher-directed instruction as limited and noncreative teaching method for both the teacher and the students. If the most important elements of direct instruction are increased assessment opportunities, uniform instruction, and non-individualistic teaching, then the point of this type of instruction appears to be unidimensional (Peterson, 1979). The current attitude of many educators, who tend to choose student-centered over teacher-directed instruction, stress the uncreative and limiting teaching characteristics instead of the benefits of teacher-directed instruction as a method to increase student learning.

Various teacher-directed instructional strategies, such a mnemonic devices, drill, and practice, have been found to increase student geographic knowledge of place name vocabulary (Bednarz, 1995; Smith, 1986; Wright, 1995). Bednarz (1995) explains the two-stage process of utilizing keyword mnemonics for associating information, and describes how the device assists students in forming links in language that aids learning facts. Smith, 1986, found another effective instructional method, drill instruction, to be helpful for building foundations of facts for quick recall. Gage (1985) explains that

teaching employs a variety of methods, whether it employs inquiry and discovery in evocative instruction or memorization, repetition, and practice in didactic instruction. At some time all types of instruction are needed in the classroom depending on the learner and the goals of learning.

Why Technology?

As more technology is daily added to classroom curriculum, an important consideration for this study would be to evaluate the effects of computers and educational technology in relation to student learning of geographic place name vocabulary. "Is there research or other evidence that indicates computers and advanced telecommunications are worthwhile investments for educators?" (Kosakowski, 1998, p. 1). Sui and Bednarz (1999) discussed the evolution of communication from oral speech to electronic communication. Their article stresses Internet usage, yet identifies the pronounced impact technology has had on society and geography education in recent years. Computers have become a very important communication device in society, and society encourages students to learn the capabilities of this tool at earlier ages (Audet & Ludwig, 2000; Maguire, 1989).

In 1993, the first edition of technology standards was adopted through the efforts of the International Society of Technology in Education (ISTE). The standards document continues to provide guidance for local, state, and national educational agencies developing and monitoring technology implementation in classrooms. The objective of several educational initiatives, the development of technology skills was outlined in Goals 2000 (1994). "Technology Standards and Performance Indicators for Teachers, 3rd Edition," is currently available as an on-line source for pre-service education, while

identifying key concepts, skills, knowledge, and attitudes for applying technological instruction in the classroom (ISTE, 2000).

Technology has become more prevalent in United States classrooms. For over 25 years, millions of dollars have been spent to equip K-12 schools with the latest technologies, often without a comprehensive outline of how technology should impact learning and instruction at each grade level (Dias, 1999; Barnett, 2001). Six extensions can be promoted for educational technology usage: Practicing, simulating, researching, creating, organizing, and presenting (Strot, 1998). When considering the contribution of the computer to the student learning process, teachers take software selection seriously as they strive to satisfy instructional goals, assesses objectives, and meet standards (Komoski & Plotnick, 1995). Disciplines, such as language arts and social studies, easily integrate technology into instruction and classroom activities (Scolari, Bedient, & Randolph, 2000).

Benefits of technology in the classroom often outweigh the complications of placement logistics, teacher training, equity issues, and time limits. School districts and schools often struggle with the complicated elements of technology placement. Locating technology within different areas of the school or the classroom requires a well-thought-out plan that provides students with opportunities to use the equipment. Technological opportunities in the classroom have contributed to student achievement with increased and more professional documentation of student work, as well as with more efficient and diverse methods of monitoring student progress. Students have exhibited higher expectations of themselves through increased self-confidence and self-motivation (May, 2001).

Computerized instruction is believed to offer several advantages over conventional textbooks and prepackaged instructional materials, assuming there exists appropriate methodology and concept coverage. Conventional seatwork may be replaced by novel and enjoyable content instruction through computer-assisted instruction. Interactive software and links with other hypermedia provide students with various opportunities for learning whether from drill tutorials to group projects involving higher level thinking skills (Good & Brophy, 2000).

A major advantage for computer use in the classroom is that, depending on the software program, a student can receive immediate feedback as to whether answers or procedures are correct or incorrect (Riding, 1984). "There are tutorial programs that provide instruction and friendly encouragement similar to what the student might receive from a tutor" (Good & Brophy, 2000, p. 332). Roberts, Friel, and Ladenburg (1988) found that literature suggested that interaction with computer encouraged students to learn factual information quickly. There are several ways to create maps using a vast array of computer software (Vasiliev, 1995). Alderman and Good (1996) describe how computers and software programs have become more available in the geography classroom, thus, providing students with bountiful databases of information useful for identifying and mapping patterns, such as the naming practices of American businesses.

Historically, new technological innovations ---- radio, television, audiocassettes, VCRs, etc.---- were expected to impact instruction since they were considered exciting, interactive, and motivational (Kosakowski, 1998; Svingen, 1994). If the technology is motivational, then students are encouraged to become active learners. Riding (1984) identifies four reasons that computer use is considered motivational: 1.) attractive

displays on the computer monitor; 2.) feedback is immediate and corrective; 3.) performance is student-monitored; and 4.) adjustable graphic displays.

The Milken Exchange on Education Technology summarized five large-scale education technology studies and determined technology increased student achievement in many academic areas when part of classroom instruction and student motivation and positive attitudes towards learning increased as well (May, 2001). "[Technology] brings novelty or at least variety to students'; school experiences and thus is likely to be more enjoyable than conventional seatwork" (Good & Brophy, 2000, p. 332).

Computer-assisted instruction

In 1969, The Association of American Geographers (AAG) was commissioned to write a paper on the application, procedures, and components of computer-assisted instruction in geography. This document also defined computer-assisted instruction, provided some historical background of the instruction, and set out some examples of computer-assisted instruction in a higher education setting within computer science and geography courses. While the age-level for the paper aims at higher education, the definitions and characteristics for computer-assisted instruction were more complete and could be important for elementary grade level classroom instruction. "There is a tendency to underestimate the ability of elementary-level children to use new technologies" (Kirman & Unsworth, 1992, p. 241).

A definite distinction was made between computer-assisted instruction and computer-based instruction within the AAG document. If the computer is used to investigate a problem, then computer-assisted instruction (CAI) is the descriptive term. CAI requires previous information and skills to identify spatial distributions through

patterns and irregularities to provide an avenue for advancing hypotheses and solving problems. Whereas, if the computer is used during instruction as an instructional tutor, of some sort, then the process is considered computer-based learning (CBL). Data is provided through the computer, understanding is assessed, and the path of instruction is determined by student responses (AAG, 1969).

It is difficult to address the existence of the two separate definitions put forth in the AAG document (1969) of computer instruction are still accepted and current, especially in elementary education. Definitions for the two computer instructional procedures have evolved since the late 1960s. Gold, Jenkins, Lee, Monk, Riley, Shepherd, and Unwin (1991) define computer assisted instruction (CAI) as a type of artificial intelligence-induced instruction which encompasses a continuum of repetitious 'programmed learning' via structured, tutorial software programs. "Today, the software and hardware used in education can differ greatly from other computer areas and applications" (May, 2001, p. 9). In the past thirty years, many CBL characteristics have blended into the CAI instructional procedures. Computer-assisted instruction has become the accepted label for educational instruction received via a computer. Some current software utilizes both types of instruction. Another term associated with CBL characteristics is computer-based instruction, which is a software program requiring the participant to make choices based on the displayed information and instructions (Kemp, Morrison, & Ross, 1994).

Kellough, et. al. (2001) define computer-assisted instruction in education as one type of technological application using a computer as a tutor; it consists of software programs designed for individual practice of a specific skills, as well as programs that

provide educational games, simulations, and tutorials for practice and drill of content to be learned by students. It would appear that if a complete definition is needed to cover all areas of education that utilizes a wide range of technological instruction, then a general, overall description for computer-assisted instruction would be useful. In the opinion of this investigator, it would be wise to accept the broad description from AAG that simply identifies computer-assisted instruction as a vast application of the computer during instruction (AAG, 1969). To limit any confusion resulting from the geographic versus educational definitions of specific types of computer instruction, this investigator will use the general term of computer-assisted instruction without capitalization in an attempt to distinguish the educational usage of computer-assisted instruction from the geographical usage of CAI and CBL.

The AAG (1969) identified several computer-assisted instruction characteristics that include a one-to-one student and teacher relationship that is individualistic, timed and self-pacing instruction, which is also self-monitoring. Content appropriate computer-assisted instructional software is available for review at any time, yet may be repeated as frequently as desired, since the information and skills focused on through the computer have been specifically identified by the teacher as what is important for the student to know and can be connected to standards-based curriculum (GESP, 1994; NCSS, 1994).

Teachers are faced with the continuous challenge of updating their knowledge of technological trends. Daily, teachers make major decisions about whether or not to use computers in the classroom and address the role of the computer in the classroom (Freiberg & Driscoll, 1996). Computer literacy is important since teachers are encouraged to use the increasingly more available computerized instruction to enrich

grade level curriculum while responding to diverse learners in the classroom by offering opportunities to learn foundational knowledge and skills through tutorial programs, educational games, and other software packages (Good & Brophy, 2000). New trends in software appear on the market and in the classroom quickly, which is a positive aspect for increased quality of software. On the other hand, software that had been useful for providing technology instruction for is not available of rudimentary computer skills or basic problem solving competence. Students could become overwhelmed by the more complex and sophisticated software programs (Harrington, Miller, Lougeay, & Cartin, 1988).

Tutorial programs, such as drill and practice software, has support from a large body of research of its effectiveness in teaching basic (Kulik, 1994). Fitzpatrick (1993) suggests that:

> "The [drill and practice] programs are functional, patient, and can be effective when used judiciously . . . The best written drill-and-practice programs are almost indistinguishable from games. The differences are subtle, and matter mainly to those focused on the means of achieving particular ends" (p. 157).

A drill and practice program is the simplest software category, and teaches new information as well as provides practice sessions (Roberts, Friel, & Ladenburg, 1988). Students have demonstrated that through computer-assisted instruction, commonly drill and practice applications, they usually learn more, and learn more rapidly, in elementary education (Fitzpatrick, 1990; Kosakowski, 1998).

Characteristics of computer-assisted instruction often parallel teacher-directed instruction elements. Links to teacher-directed instruction may be found in software instructional features that provide sufficient response opportunities, sequential tasks, and frequent feedback (Wilson, Majsterek, & Simmons, 1996). Other related features of computer-assisted instruction to teacher-directed instruction include the highly structured delivery of content, specific expectation and goals, as well as consistent assessment of student progress.

Software usage in the classroom:

Research seldom supplied grade level-specific software information in the literature. Software related to drill procedures were discussed in terms of elementary grade levels, and usually targeted reading or math concepts. In some of the literature educators compared characteristics of several software programs to discover the extent to which the concepts increased knowledge for special populations. A large amount of the geographic software is a geared for encouraging or training 6-12 grade level students and college level students to research, promote problem solving, or utilize higher level thinking skills (Gold, Jenkins, Lee, Monk, Riley, Shepherd, & Unwin, 1991).

Students find computers and associated software applications useful for a variety of reasons in the classroom whether they are engaging in building knowledge, gathering information, increasing skill levels through practice, or creating presentations (Good & Brophy, 2000). Drill and practice programs are best used for short periods of time for review or remediation, supplying immediate feedback, and adjusting the level of difficulty to the student's ability (Strot, 1998). Gold, et. al., (1991) identified a spectrum of computer-assisted instruction from specific resources (i.e., drill and practice tutorials)

to flexible and focused resources (i.e., simulations) to generic resources (i.e., information processing systems that have no direct relationship to geography).

Current research promotes databases, geographic information systems, CD-ROM atlases, encyclopedias, videos, and other software programs as instructional opportunities for students (Sebesta & Miller, 1995; Svingen, 1994). One software program, to stimulate interest in geography, instructed students to place "map pins" on a three-dimensional globe (electronically marking certain points on the map)" (Pride, 1997).

Increased application of educational technology in the classroom has been reported throughout the last decade (Brennan, 1992; Kosakowski, 1998; May, 2001). Opportunities for integrating technology occurred during instruction with a variety of computer software programs. In the early 1990s, various computer software was utilized, yet many programs were used more frequently than others. Text processing tools were used more frequently than all software programs, yet instructional software and analytic and information tools were included more than games, simulations, graphics, and operating tools (Brennan, 1992).

Troutner (1999) provides an overview of several current software packages. Of the software featured in the document, geographic concepts are the emphasis in two packages. One program, designated for grades 4-9, provides access to numerous maps from all over the world from 3000 BC to 1990 and includes capabilities for limited customizing of the maps, as well as additional features for presentation. The other program, created for grades K-3, encourages collection of data, prediction, evaluation, and spatial concepts while delivering packages around a town. Technology is able to provide a variety of resources through various types of software programs and connection

with the Internet. Technology programs were deemed successful when teachers choose specific technological activities to support integrative and standards-based curriculum (May, 2001). Additional examples use technology to save the teacher instructional time in the classroom.

Identification of mapping patterns is the focus of a couple of software programs, as students collect, organize, manipulate, and present a vast amount of name data quickly to depict spatial distributions. The software programs provide avenues for visualizing populations and regional economic activities. "Computer technology greatly increases the efficiency and ease of mapping patterns of names" (Alderman & Good, 1996, p. 1).

The use of geographic information systems software in elementary grade levels has been encouraged for a variety of reasons in the past ten years. Educational trends support the utilization of geographic information systems (GIS) in classrooms reflecting realism curriculum and project-based learning emphasizing problem solving skills and open-ended inquiry (Audet, 1994; Audet & Ludwig, 2001; Barstow, 1994; Weller, 1993). Many geography departments provide courses for undergraduates and graduates that explore spatial and nonspatial data relationships through GIS technology (Walsh, 1992) or map projections through software applications from government agencies (Wikle, 1991). To be successful during similar instruction at elementary levels, young students must have a foundation of learning that includes a solid knowledge framework and basic skills in geography. Even preschoolers have found various computer software to be motivating and an effective basic skill-building tool (Entrychcock & Noonan, 2000). "Also, some programs allow students to respond actively and in varied ways. Along with electronic workbooks for drill and practice, there are tutorial programs that provide

instruction and friendly encouragement similar to what the student might receive from a tutor" (Good & Brophy, 2000, p. 332).

Click and Learn Software:

Click and Learn Software© is a computer program developed in 1992 by Robert E. Reynolds to promote geographic education. It was created in a drill and practice tutorial format for all ages, so all instruction is individualized. This software has several features that may motivate students to learn geographic place names, or other factual information from a variety of disciplines. The most current version of the software program (Reynolds, 2002) can be found on-line at http://www.clickandlearn.com, where individuals may complete free demonstration games, download free maps, or connect to a wide variety of other program areas.

The focus in the current study will be only on the place name vocabulary drills. One element of the software is that it assists students to memorize large quantities of information in a brief amount of time. Through a series of fast-paced and timed drills, students constantly review and repeat pieces of information. Usually the information is grouped in series of seven or eight elements. Students use the computer mouse to click on the elements as they are presented on the monitor screen. Immediate feedback is given to students as they provided a correct or incorrect answer. The software program is easy to learn, and the computer gives all directions to the student, after the initial software installation and set-up directions are given by a teacher.

During the pilot study, for this research project that compares computer-assisted instruction to teacher-directed instruction, students attempted to learn to identify and locate the 50 United States on a USA map, then identify and locate 50 World Places on a

world map. At first glance, the software appears to only be based on the memorization of facts, in this case places. Yet students are expected to develop an automaticity of knowledge of geographic place name vocabulary, which is generated through the controlled practice by responding quickly and accurately via the computer (clicking the mouse on the appropriate place on the computer monitor). The drill process not only generates a recalled factual response, it also expects the participant to locate the place on a map. This process entails more than memorization and recall of a place name, it requires a cognitive map for identification of absolute location of the place.

The format of the software program enables a teacher to develop age-appropriate and standards-based curricular activities for computer-assisted instruction. The tutorial drills may be adjusted and changed quickly by the teachers to fit the needs of individual students and the content area. On-line access allows students to continue to practice the drill outside the classroom without any extra equipment or materials, such as CD-ROMs or worksheets. There are paper and pencil pretests and posttests to evaluate learning progress of each topic. Study notes, lists, and maps are also available to students on-line.

At first, the on-line maps are unlabeled, randomly colored maps, but after mastery of a couple drills, the maps switch to blackline/white maps since that is the type of map utilized during the pretests and posttests. A main reason for the switch from color to blackline/white maps is that color, even the randomly assigned color, has been found to assist the students in remembering locations. The software program has an internal monitoring system that this study will not take advantage of because of time constraints.

This investigator has found that Click and Learn Software© objectives and characteristics meet the National Social Studies Standards in relation to Theme # III----

People, Places, and Environments, which is the study of people, places, and human-environment interactions (NCSS, 1994). While utilizing the drill software program, students think beyond their personal locations to create their own spatial views and geographic perspectives of the world to answer the question: Where are things located? The software also relates to the National Geographic Standards, Standard 2, Grades K-4---The World in Spatial Terms (GESP, 1994). As students learn to identify and locate the places on the maps, they are forming their own mental map to organize information about relationships of places in a spatial context. Standards clarify instructional focus for student learning, providing guidelines for future instruction.

Click and Learn Software© is available on CD-ROM to run on both Macintosh computers and Windows computers with 5.0 and up. Network versions on the Click and Learn Software© website are also available. Computer requirements include Macintosh or Windows with Internet Explorer or Netscape Navigator version 5.0 and up. The website also offers free access to demonstration drills, as well as practice maps.

Standards-based Curriculum:

At the heart of standards-based curriculum is the teacher. Newmann (1998) suggests that instructional quality is one of the main factors that have been found to improve student success in schools. Three general features are influential for academic success, specifically:

> "The teacher must direct student effort to appropriate academic outcomes—through high-quality curriculum, effective pedagogy, and an instructional climate that rewards rigorous academic work by all students" (Newmann, 1998, p. 92).

Using standards as their guide, teachers develop objectives and assessments that focus on what the students should be learning during instruction (Izumi, 2001). The national standards were developed as guides for classroom instruction and provide benefits for students in a variety of ways. Standards have been found to provide a sequenced and detailed explanation of important content for each grade level (Hope, 1996).

National and state curricular standards in social studies and geography were initiated, and eventually published, for several disciplines to identify what students should learn, why they should learn it, and when they should learn it (GESP, 1994; NCSS, 1994). Specifically, social studies and geography standards established guidelines for student learning at all grade levels.

The conception of voluntary, national geographic standards began after the drafted document of Goals 2000: Educate America Act, in 1989, and adoption of National Education Standards, in 1990. The National Geographic Standards, as stated in the document Geography for Life (1994), reflect a systematic instructional approach for geography education that is based on the people and environments of the United States and their relationships in a global society. Teachers may now provide standards-based instruction which challenges students to meet the standards to expand their learning and measuring accountability (GESP, 1994).

National Social Studies Standards define the social studies concepts, skills, and perspectives that students should be learning, how they are learning it, when they should learn it, and how student learning will be assessed. The standards were defined to provide comprehensive instruction for the individual disciplines of social studies, even though several of the disciplines, such as geography, have published content-specific national

standards. "These social studies standards are thus organized to incorporate learning experiences from many disciplines" (NCSS, 1994, p. ix). Early, middle, and high school educational levels are the focus of the ten standard themes. The themes guide student classroom experiences outlined in performance expectations.

Technology standards and content standards encourage computer-assisted instruction in the classroom for increased student achievement (ISTE, 2000). The combination of technology-based standards and content-based standards are recognized as important ingredients for student learning, yet there is a need to review the impact of technology on improving student academic success and demonstrating it through assessment scores. "Recent research is concerned with how technology is used by teachers to meet content standards and improve student achievement on a variety of assessments" (May, 2001, p. 11).

"Almost all of the recent 'national' standards explicitly include not just one but two kinds of knowledge: substantive and procedural" (Davis, 1998, p. 205). There are concerns that standards impede individualism in instruction, interdisciplinary projects, and, possibly, learning styles, but with careful planning these obstacles may be overcome. Davis proposes the need for both types of knowledge in a meaningful, robust curriculum at the child-level, not the adult level.

Evaluations on the impact of educational standards on student achievement are beginning to appear in the literature. Some state and local data have been found to support the alignment of standards with curriculum and assessment. Wilson and Floden (2001) described standards-based reform efforts as a focus on accountability with some teachers feeling the constraint and limits of standards, while other teachers felt the

standards raised their professional expectations. However, there continues to be areas where standards-based reform has not demonstrated success. In particular, there are some disciplines without model curriculums, or there are weak or poorly written standards (Fuhrman, 2001). Some research has found that standards-based reform provides clear guidelines for curriculum development.

Fortunately, neither social studies nor geography education has that problem. Both disciplines have strong national organizations supporting development of clear and concise standards, as well as curriculum for classroom teachers (GESP, 1994; NCSS, 1994). Geography and social studies standards, also, maintain connections with technology for encouraging growth in student knowledge for living in a global society.

Chapter 3

RESEARCH PROCEDURES

This study was a quasi-experimental research design (Campbell & Stanley, 1963; O'Sullivan & Rassel, 1989), which is also known as a nonequivalent control group design (Krathwohl, 1998; O'Sullivan & Rassel, 1989). Basically, the diagram construction of the quasi-experimental research design was a comparison group pretest-posttest design, which appears similar to a classic experimental design:

Teacher-directed instruction:	O_1	X_1	O_2
Computer-assisted instruction:	O_1	X_2	O_2
Control Group/no instruction:	O_1		O_2

Thus, the control group label was restricted to the group receiving no instruction between the pretest and posttest (O'Sullivan & Rassel, 1989).

The research design included a schematic model and a symbolic model. The schematic model referred to the maps used during the instructional treatments, the pretest and the posttest. The students were provided lists of places supplied the place names to be located on the world maps. Following treatment, the students were to appropriately depict the relationships between the places and their location on the maps. Simple elements were found on the unlabeled blackline map and the colored map and understood by the subjects during treatments. The symbolic model, in this case a map, referred to the written words used during instruction and to identification of the place names, as well as the internal elements and procedures of the computer software. Use of an auditory voice in both of the instructional treatments, by the teacher and the

computer, provided further clarification for students at the fourth grade level who may not recognize the place names at first (O'Sullivan & Rassel, 1989).

The population of the study was fourth grade students, and they could not be re-assigned from their classrooms into randomly selected groups. The fact that the population could not be randomized posed a possible threat to the internal validity of the study. It was not possible to insure that any of the population groups were equivalent since they had been organized in intact, pre-established classroom groups for the academic year.

The study settings were in the same school district. The pilot study was located at a different school than the final research project. General demographic data of the school district depicted the majority of students were classified having "normal" characteristics; there were also small student populations of varying sizes within the district defined as minority, 'at risk,' autistic, hearing impaired, sight impaired, learning disabled, and behavior disordered.

The school that participated in the final research project accommodates a specialized program for autistic students. One autistic student received instruction in one of the classroom groups. More specific details and other demographic specifications related to the pilot study and final research project subject populations, teachers, and settings have been explained separately as they relate to the settings during the following chapters.

The investigator chose the content to be studied by all groups based on previous studies completed at higher grade levels (Saveland, 1980; Smith, 1986). Saveland and Smith expected eighth grade students to identify and locate 50 world places on an

unlabeled, blackline world map. The fourth grade students in this study were expected to identify and locate the same 50 world places [See Appendix B].

All students were taught to identify and locate 50 World Places geographic place name vocabulary. The content was the same in all groups and schools. The investigator provided a set of scripted instructions for each of the classroom teachers to use as they presented directions and modeled expectations.

The scripted instructional information for both methods was written in small, incremental steps so students could learn the information easily, yet quickly. The instruction, scripts, and outlines given to the classroom teachers were as similar as possible.

Treatment Details

The research design was pretest, treatment, and posttest. The geographic content taught during the treatment was grade-level appropriate and standards-based material of geographic place name vocabulary identification of 50 world places and their location on a world map. Grade-level appropriate material refers to the fact that in the school district fourth grade social studies curriculum for all schools covers United States regional geography concepts and skills. This curriculum includes basic mapping skills of identification and location of places within the United States. The social studies textbook also includes some global regions and places in comparison to the fifty states. Since world places had not specifically been covered as part of the regular classroom curriculum, the investigator could not expect the students to have prior knowledge of the content.

Treatment included two methods of instruction that covered geographic place name vocabulary, "50 World Places." The purpose for the instruction was for students to learn to identify and locate the 50 world places on an unlabeled, blackline world map. Teacher-directed and computer-assisted instructional treatments were presented 15 minutes a day for 10 days. All classroom sessions were recorded on videotape. The investigator periodically monitored administration of the treatments and kept in close contact with the classroom teachers via e-mail messages and telephone calls.

Subjects were fourth grade students at a suburban school. The class demographics reflected the school building demographics. There were three classrooms of students. One group of subjects, Group A, received teacher-directed instruction, and the other group of subjects, Group B, received computer-assisted instruction. Group C, a third group of subjects, was the control group, and received no treatment between the pretest and posttests. The instructional groups were compared to the control group through pretests and posttests scores to determine the validity of the study.

Parental Consent Forms were sent home with the students in all three groups prior to beginning treatments. Student participation in the study is listed below:

1. Group A: One classroom group of 22 students received teacher-directed instruction in their classroom.
2. Group B: One classroom group of 21 students received computer-assisted instruction in the school's computer lab.
3. Group C: One classroom of 20 students was the control group. The group remained in their classroom and received no instruction on the study's content between the pretests and posttests.

Prior to the study, the teachers received training from the investigator over goals, expectations, and directions during instruction. The classroom teachers, also, completed the required on-line instruction for treatment of human subjects. Each classroom teacher received scripted instructions to read during the treatment. The teacher-directed instructional script [See Appendix C] was as identical as possible to the computer-assisted instructional script [See Appendix D].

Instruction about how to manipulate the software program (Reynolds, 2002) was given to the classroom teacher by the investigator. The teacher providing computer-assisted instruction required strategies to demonstrate how to manipulate the computer software program on-line, as well as how to cope with any technical problems, should they arise. The computer-assisted instructional script contained initial computer technology set-up instructions to guide students through the process of connecting to the Internet, which linked to the online software and the drill sets. Other than the introduction of set-up procedures and basic screen guidelines, no additional instructions were provided by the Group B teacher over the content during the computer-assisted instruction.

At the beginning of the treatments, Groups A, B, and C took the "50 World Places" pretest. The three classroom teachers read aloud the scripted directions for the pretest to the students. During the pretest, the students utilized the alphabetical list of 50 world places to identify and label the places on an unlabeled, blackline world map. Groups A and B received instructional treatment during 15 minutes each day for 10 days to learn to identify and locate the world places. Group C received no instruction between pretest and posttest. After Day 1, students practiced on the facts mastered

during the previous class session, then practiced 'new' facts from the master list. The purpose of instruction was to complete the drill sequence by learning to identify the place name and location of all 50 world places in alphabetical order within the time limit.

Both methods of instruction utilized a voice reading aloud the place names in order to familiarize the students with the place vocabulary. During the first round of computer-assisted instruction, the computer read aloud each place name in alphabetical order. The following instructional rounds required the students to read the place name. Throughout all sessions of teacher-directed instruction the teacher read aloud each place name in alphabetical order, and the students provided a choral response. Both groups receiving instruction were expected to learn the places in alphabetical order, then the drill sequence was completed again in random order. Following instructional sessions, Groups A, B, and C took a posttest to identify and locate the 50 world places on an unlabeled, blackline map of the world. The teachers read aloud the scripted directions for the posttest. By identifying and locating places through review and repetition cognitive processes enable the learner to collect, encode, store, recode, and evaluate useful data on the maps. Thus, a cognitive map is formed for future use.

Data Analysis

The data was evaluated for gains in differences of pretest to posttest scores between the two instructional methods, as well as to the control group. Comparison of the control group scores to both the instructional methods scores validated the instrumentation. The data comparison of the two instructional methods showed a gain

of student academic achievement. Significant difference of the pretest to posttest scores were expected between the two instructional methods.

Scores were evaluated for normal distribution. A simple t-test was used to determine whether or not a significant difference existed between the two variables. Data sets were compared for measures of dispersion between methodologies. Line and bar graphs were created to easily identify pretest to posttest differences. The possibility existed that the two samples have different means. Other data statistics could be run as required for explaining data relationships. The alpha level selected was equal to .05, which means there is a 5 percent chance that an untrue hypothesis will be accepted.

After the treatment sessions, students were given the opportunity to participate in a debriefing session with the investigator. They answered specific questions [See Appendix G] asked by the investigator. Then the students gave opinions and asked some questions of their own about the study. The teachers were given a survey to complete and return to the investigator at a later date. The purpose of the teacher survey [See Appendix G] was to find out whether or not there was confusion or comments about the specific directions and expectations of the study. Survey answers could be used for redesigning this research design for future studies.

Chapter 4

MAIN STUDY RESULTS

Hypotheses

This study attempted to answer the basic question as to whether or not computer-assisted or teacher-directed instruction would be more successful for improving student geographic knowledge of world place name vocabulary. Directing the study were three specific questions around which the following hypotheses were developed:

H_{01} –Students receiving computer-assisted instruction will demonstrate a significant difference between pretest to posttest scores.

H_{02} –Students receiving teacher-directed instruction will demonstrate a significant difference between pretest to posttest scores.

H_{03} – There will be significant difference between the pretest to posttest scores of teacher-directed instruction and computer-assisted instruction.

Design

This study employed a quasi-experimental research design of pretest, treatment, and posttest. The students were in three pre-established classroom groups to which they had been assigned at the beginning of the school year. Classroom assignments were designated at the end of the previous year, when the students were in third grade. Every attempt was made during the pre-assignment meetings to have the number of students in each class as similar as possible. Attempts were made to have the students assigned to

classrooms weighted-by-needs by using a specialized computer program that is being piloted by this school building. Over the summer, parents may give additional input into which classroom they believe their student should attend, and the principal adds their opinions to the assignment considerations. Then at the beginning of the school year, new students are assigned to the classroom with the lowest numbers, unless a person with special needs is identified during that year's enrollment sessions. As the year progresses, students move away or into the school neighborhood, and classroom numbers are adjusted to keep the balance of students per classroom fairly even. Disaggregated data of student mobility rates related to this elementary school has been, over time, at about 19%. Current student mobility data is not available at this time.

Three classrooms of fourth grade students received instructional treatments. Treatments were randomly assigned to the three experimental groups by having each teacher choose an unmarked script folder. One classroom of students, Group A, received teacher-directed instruction treatment. A second classroom of students, Group B, received the treatment of computer-assisted instruction. The purpose of the study was to see whether or not either or both instructional methods would increase student learning of geographic place vocabulary, and whether or not one treatment revealed any significant advantage over the other. The third classroom, Group C, was the control group.

Study Site

The basic setting of the study was in a suburban, Midwestern school which had 488 students, K-6, as a total population. The school is noted for its dedication to student growth, parental involvement, enthusiastic teachers, and innovative programs,

and has won several national awards. The school district does not require a standardized local, state, or national assessment for social studies before grade 6, so there were no statistical comparisons to other assessments available for this study. Scores for grade 6 on the Stanford 9 were last listed in the Building Report Card (Unified School District #497, 2002) only for the school year 2000-2001. The Social Studies NCE score for 1999-2000 was 66.9%, and for 2000-2001 was 70.9%. These results do not directly relate to this research since the population participating in the study were in the 4th grade, yet the Kansas School Building Report Card data compiled by the State Board of Education states that the 6th grade students from this building did achieve the standard of excellence in social studies for the 2000-2001 academic year (Kansas State Board of Education, 2002).

Population

Fourth grade students in the suburban elementary school comprised the subject pool. The grade level had a population total of 68 students. Building demographics by gender (male, 51%; female, 49%) were similar to the grade level demographics with 34 were male and 34 female. In a report from the school district, a nominal level of measurement in this building profiled the 68 students within the fourth grade population as follows: 63 as 'white,' 2 as 'black,' 2 as American Indian/Alaska Native, and 1 as Asian/Pacific Islander (Unified School District #497, 2002).

The Kansas State Board of Education [KSBE] (2002) profiled building data, as of December, 2001, with a total enrollment of 498 students (state-wide student population was 494,131). The building population profiled 7% of the students as 'economically disadvantaged,' compared to 32% state-wide. Other building and state

data could be compared from tables provided on the KSBE Web site within the Building Report Card (KSBE, 2002).

Group A received teacher-directed instruction in the regular classroom setting from the scripted directions. There were 23 students in the classroom receiving treatment. Twelve students were male and eleven were female. Five special needs students were identified: 2 as gifted, 2 as learning disabled, and one as hearing impaired. The teacher required the students to leave their desks and sit on the floor in front of the overhead map and chart. The investigator had not suggested this procedure. The teacher later explained her reasoning for this move in her comments on the Teacher Survey (See Appendix G). She thought the students would pay closer attention to instruction if they were not at their desks where they could distract themselves by digging in their desks, doodling, or playing with other items to be found in and on a student desk. She had several behaviorally challenged individuals in her classroom who required very structured activities and extra supervision.

Group B received computer-assisted instruction. There were 22 students in the classroom of which 3 were identified gifted, 2 were learning disabled, and 4 received additional speech and language instruction. Ten of the students were male and twelve were female. The students and teacher daily left their classroom to go next door to the computer lab. Each student had an individual computer and workstation in the lab. During Day 1 of instruction, the classroom teacher provided online, entry instructions, from the provided script, to the Click and Learn Software© (Reynolds, 2002) online program. After Day 1, the teacher acted as facilitator, monitor, and troubleshooter for

which there was no script. The investigator depended on the videotaped sessions to monitor daily treatments.

Group C received no treatment; they were the control group. The control group consisted of 20 students out of the 21 students in the classroom. These students took the pretest and posttest when the other groups took the pretests and posttests, yet received no instruction between the tests. Eleven of the students were male and nine were female. Five students were identified as having special needs; one student was identified as gifted, one as autistic, and three were identified as learning disabled.

All three groups took the pretest and posttests within their regular classroom setting. Teachers read aloud the directions for taking the tests. The students were given 15 minutes to complete the pretest the day before the first day of instruction. On the day following the final treatment sessions, the three groups were given 15 minutes to complete the posttest.

Data Analysis

The dependent variables for this study were pretest and posttest scores for Groups A and B. The independent variable was the type of instruction each group received: teacher-directed or computer-assisted. An exploration of the frequency statistics was conducted to see whether or not the data was normally distributed. The test did not show a normal distribution of scores.

Pretest and posttest scores of the three groups were rechecked for frequency distribution via a stem-and-leaf table (Table 4.1, p. 94). Tukey invented the stem-and-leaf diagram in 1977 as a method for demonstrating score distribution (Krathwohl,

Table 4.1:

Stem-and-Leaf Diagram: Frequency Distribution of Scores

PRETEST		POSTTEST	
0	2 2 4 4 5 5 5 5	0	4 .
	7 7 7 7 7 7		7 .
	8 8 8 8		8 8
	9 9 9 9 9 9		9 9 9 9
1	0 0 0 1 1 1 1	1	0 0 0
	2 2 3 3 3 3		1 1 2 2
	4 4 4 4 4 4 4 5		4 5 6 6 6
	6 6 6 6 6 7 8 9		7 8 8
2	1 2 3 3	2	0 1 1 2
	4 6		4 4 6
	8 9 9		8 9
		3	3 5
			6 6 7
			9 9
		4	0 0
			5 5 5 5 5 5 5
			6 8 8 8 8
			9 9 9
		5	0 0 0 0 0 0 0[a]

Note:

n = 63 [Group A, Group B, and Group C]

[a] 7 out of 63 students scored 100% on the posttest

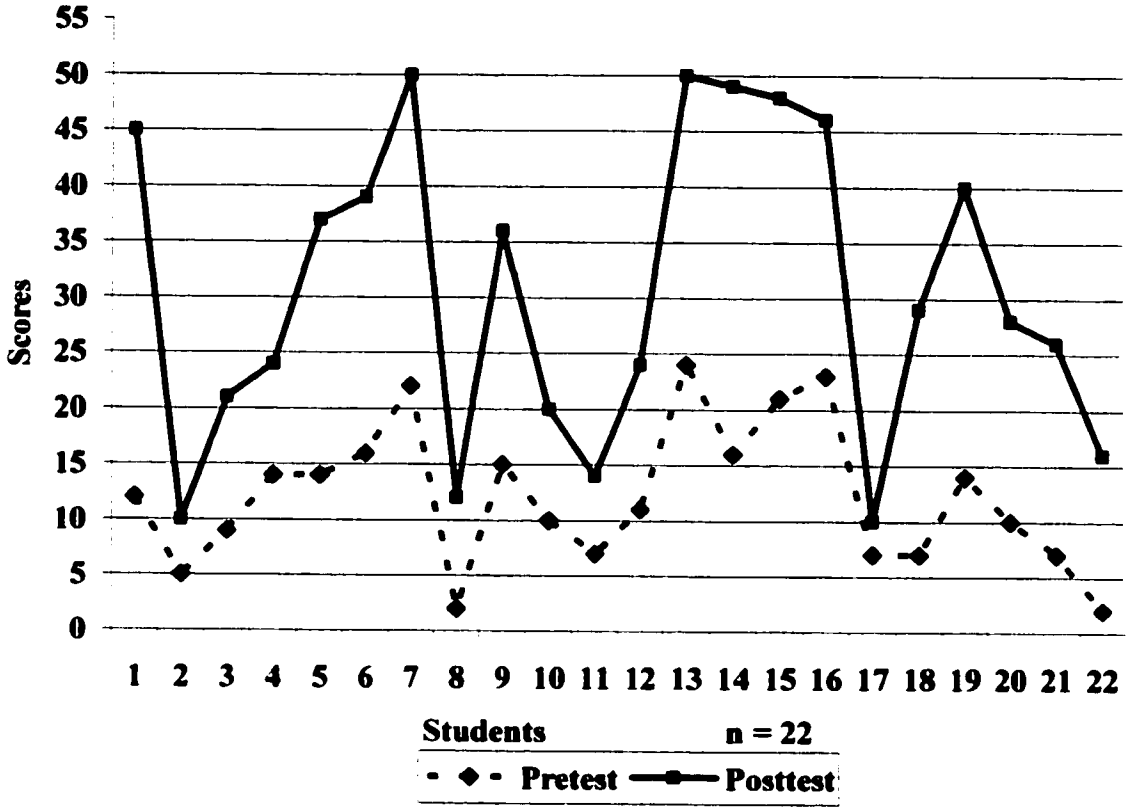
1998). The pretest scores were grouped in the lower numbered area of the distribution. Two students scored 58% on the pretest, which meant they had 29 correct answers out of the 50 possible. The largest percentage of students chose 76% of the correct answers between 7 and 16. The lowest scores were two students who chose 2 correct answers on the pretest. The highest score received by 7 students on the posttests was 100%.

Pretest scores had a skew value of .671 was between Group A and Group B, which showed a large distribution of the pretest scores to one side, the left. In comparison to the pretest scores, the negative skew value of -.838 showed a flatter distribution for the wide range of posttest scores for Group A and Group B (See Appendix H). A kurtosis value of the Group A and Group B pretest scores was .089, showing a large distribution of scores on the left. There was a flatter distribution curve for the posttest scores with a negative kurtosis value of -.645 (See Appendix H). The skew values and kurtosis values showed through line graphs that the scores of Group A and Group B were not normally distributed.

Individual groups were described through pretest and posttest scores in frequency distribution line graphs. The vertical axis shows a grid mark for each student in each group. The horizontal axis plots the scores from 0 to 50 with equal numerical increments of 5. Relationships between pretest to posttest scores are shown in the graphs on the following pages. The pretest scores for Group A ranged from 2 to 24 (Figure 4.1, p. 96), and Group B scores ranged from 4 to 29 (Figure 4.2, p. 97), whereas, the Group C scores ranged from 5 to 29 (Figure 4.3, p. 98). The dispersion of group scores pinpoint specific score arrangements. No student scored were above 29 on

Figure 4.1

Line Graph of Frequency Distribution: Group A

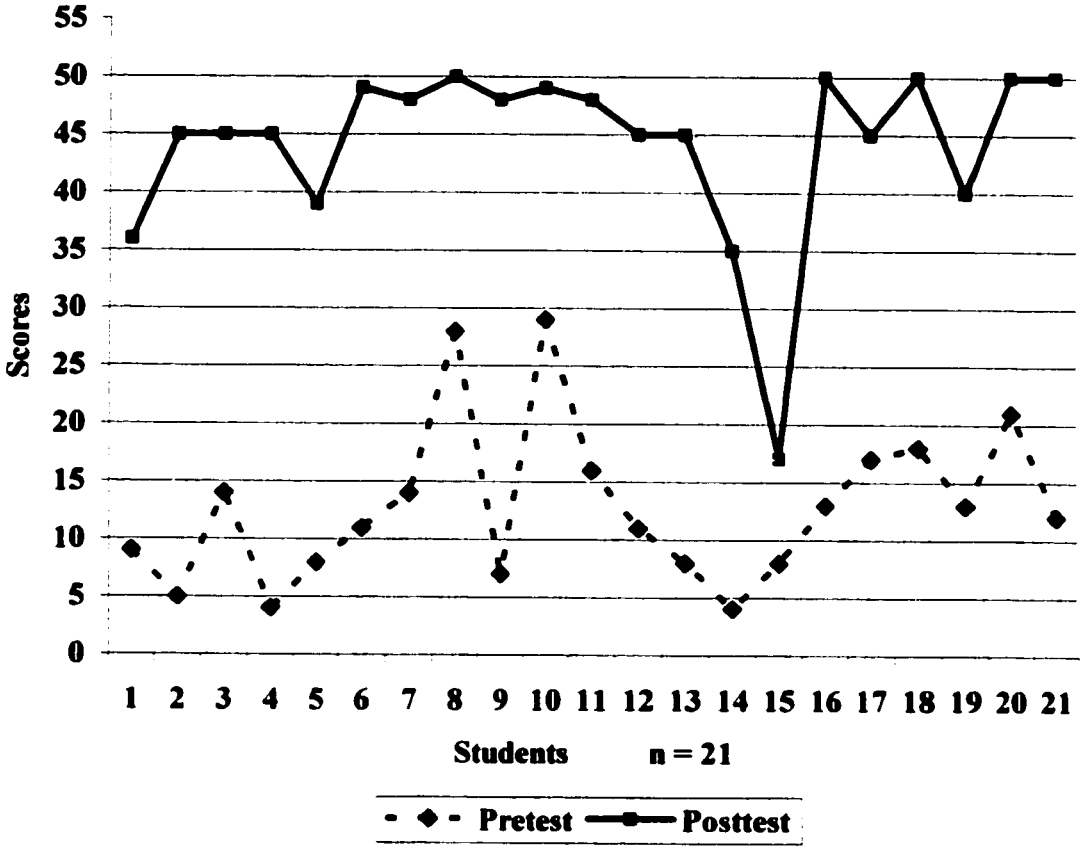


Note:

Group A, teacher-directed instruction, reported pretest to posttest score gains for each student. Total score possible was 50 points. Two students received 100% on posttest scores. Thirteen out of twenty-two students scored over 50% on posttest.

Figure 4.2

Line Graph of Frequency Distribution: Group B

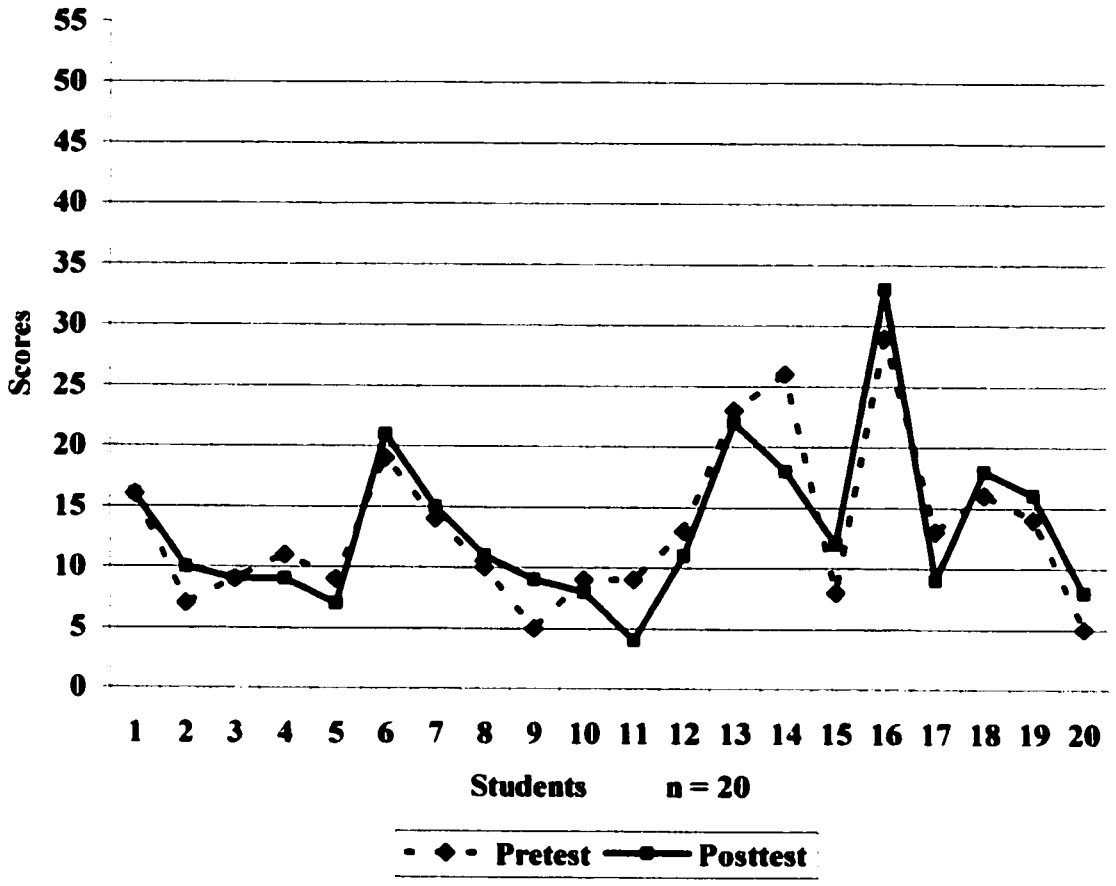


Note:

Group B, computer-assisted instruction, reported pretest to posttest score gains for each student. Total score possible was 50 points. Five students received 100% on posttest scores. Twenty out of twenty-one students scored over 50% on posttest.

Figure 4.3

Line Graph of Frequency Distribution: Group C



Note:

Group C, control group, received no treatment between pretest and posttest. Total score possible was 50 points. Seven students received slightly higher scores on posttest. Eight students received slightly lower scores on posttest.

the pretest. Two students in Group A received posttest scores of 50 (100%). Five students in Group B received posttest scores of 50 (100%).

Pretest means were calculated for each group. The pretest mean for Group A was 12.18. Mean differences between pretest and posttest scores fell into a range of 3 to 33 for Group A (Table 4.2, p. 100). Posttest means were calculated as 30.63 for Group A. The pretest mean for Group B was 12.85. Mean differences between pretest and posttest scores for Group B fell into a range of 9 to 40 (Table 4.3, p. 101). Posttest means were calculated as 44.23 for Group B. The pretest mean for Group C was 13.25. The overall pretest mean for Group C was greater than for the other two groups. Mean differences between pretest and posttest scores fell into a range of –5 to +4 for Group C (Table 4.4, p. 102). Posttest means were calculated as 13.30 for Group C.

The pre- to post- paired differences standard deviation of Group A was 8.83; Group B was 7.74; and Group C was 3.23. The standard deviation estimates the variance of variable distribution within the population. Overall pretest scores had a standard deviation of 6.58 with a mean of 12.7, while the posttest scores had a standard deviation of 16.05 with a mean of 29.7.

Correlations between pretest and posttest scores for Group A are .879. Correlations for Group B between pretest and posttest scores are .447. Pretest and posttest score correlations for Group C are .884. Correlations for Group B and Group C were close in value, whereas, Group A had a smaller correlation value.

One-tailed t-test values were generated for Group A and Group B to check whether or not one of the groups' means would be greater than the other. One-sample t-tests were also conducted to explain directional hypotheses: H_{01} and H_{02}. O'Sullivan

Table 4.2

Group A: Pre- and Post-test Scores with Differences

Pretest	Posttest	Difference
12	45	33
5	10	5
9	21	12
14	24	10
14	37	23
16	39	23
22	50	28
2	12	10
15	36	21
10	20	10
7	14	7
11	24	13
24	50	16
16	49	33
21	48	27
23	46	23
7	10	3
7	29	22
14	40	26
10	28	18
7	26	19
2	16	14

Note:

Pretest and Posttest Data: n = 22
Pretest $\bar{x}$ = 12.1818 Standard Deviation = 6.4190
Posttest $\bar{x}$ = 30.6364 Standard Deviation = 13.9268

Correlation:
Pre- and Post- Correlation = .879 Significance = .0001

Pre- to Post- Paired Differences:
$\bar{x}$ = -18.4545 Std. Deviation = 8.8357
t = -9.797 Significance = .0001

Table 4.3

Group B: Pre- and Post-test Scores with Differences

	Pretest	Posttest	Difference
9		36	27
5		45	40
14		45	31
4		45	41
8		39	31
11		49	38
14		48	34
28		50	22
7		48	41
29		49	20
16		48	32
11		45	34
8		45	37
4		35	31
8		17	9
13		50	37
17		45	28
18		50	32
13		40	27
21		50	29
12		50	38

Note:

Pretest and Posttest Data: n = 21

Pretest $\bar{x}$ = 12.8571 Standard Deviation = 6.9230

Posttest $\bar{x}$ = 44.2381 Standard Deviation = 7.7389

Correlation:

Pre- and Post- Correlation = .447 Significance = .042

Pre- to Post- Paired Differences:

$\bar{x}$ = -31.3810 Std. Deviation = 7.7426

t = -18.573 Significance = .0001

Table 4.4

Group C: Pre- and Post-test Scores with Differences

Pretest	Posttest	Difference
16	16	0
7	10	3
9	9	0
11	9	-2
9	7	-2
19	21	2
14	15	1
10	11	1
5	9	4
9	8	-1
9	4	-5
13	11	-2
23	22	-1
26	18	-8
8	12	4
29	33	4
13	9	-4
16	18	2
14	16	2
5	8	3

Note:

Pretest and Posttest Data: n = 20
Pretest $\bar{x}$ = 13.2500 Standard Deviation = 6.6718
Posttest $\bar{x}$ = 13.3000 Standard Deviation = 6.7442

Correlation:
Pre- and Post- Correlation = .884 Significance = .0001

Pre- to Post- Paired Differences:
$\bar{x}$ = -5.0000E-02 Std. Deviation = 3.2359
t = -.069 Significance = .946

and Rassel (1989) recommend the use of one-tailed t-tests to test whether or not one group's means were greater than the other. A second, two-tailed t-test of variances was run to explain the third hypothesis [H_{03}], and describes whether or not the two groups have different means. The t-tests also checked whether or not one group's mean scores would be greater than the others. Group A had a t-test value of 8.901 for the pretest and 10.318 for the posttest. Pretest to Posttest paired differences provided a t-value of –9.797 for Group A. Group B had a t-test value of 12.8571 for the pretest and 44.2381 for the posttest. Pretest to Posttest paired differences provided a t-value of –18.573 for Group B. The t-test values of Group C were 8.882 for the pretest and 8.819 for the posttest. Pretest to Posttest paired differences provided a t-value of –.069 for Group C. The least amount of difference between pretest to posttest scores was found in Group C.

An analysis of variances [Oneway ANOVA] was run to describe deviations between groups and within groups. Between the groups of pretest scores the combined significance was .871, and F was .139. The posttest scores between groups were highly significant at .0001, and F was 48.101. Within group posttest scores had a $\bar{x}^2 = 102.252$ (Table 4.5, p. 104).

Finally, a Tukey post hoc test was run to compare mean differences. Significance was set at the .05 alpha level. The mean difference was significant at the .05 level for all three groups on the posttest scores. Group A to Group B had a posttest mean difference of -13.6017. Group A to Group C had a mean difference of 17.3364 between group scores. Group B to Group C had a mean difference of 30.9381 (Table 4.6, p. 105) The comparison of mean differences showed significance between all groups, especially between the computer-assisted instruction and the control groups.

Table 4.5

ANOVA

				Sum of Squares	df	Mean Square	F	Sig.
PRE	BG			12.342	2	6.171	.139	.871
		Linear Term	Unweighted	11.953	1	11.953	.269	.606
			Weighted	12.063	1	12.063	.271	.604
			Deviation	.279	1	.279	.006	.937
	WG			2669.594	60	44.493		
	Total			2681.937	62			
POST	BG			9836.900	2	4918.450	48.101	.000
		Linear Term	Unweighted	3148.614	1	3148.614	30.793	.000
			Weighted	2898.869	1	2898.869	28.350	.000
			Deviation	6938.031	1	6938.031	67.852	.000
	WG			6135.100	60	102.252		
	Total			15972.000	62			

Note:

ANOVA = Analysis of Variances
PRE = Pretest
POST = Posttest
BG = Between (Combined) Groups
WG = Within Groups
df = degrees of freedom
Sig. = significance

Table 4.6

Tukey Post Hoc Tests

MULTIPLE COMPARISONS

Dependent Variable:	Groups(J)	Groups(K)	Mean Difference (J-K)	Sig.
PRETEST	A	A		
		B	-.6753	.941
		C	-1.0682	.863
	B	A	.6753	.941
		B		
		C	-.3929	.981
	C	A	1.0682	.863
		B	.3929	.981
		C		
POSTTEST	A	A		
		B	-13.6017*	.000
		C	17.3364*	.000
	B	A	13.6017*	.000
		B		
		C	30.9381*	.000
	C	A	-17.3364*	.000
		B	-30.9381*	.000
		C		

Note:

* Mean difference is significant at the .05 level.

Table 4.7

Homogeneous Subsets: Pretest

Tukey HSD [a b]

Groups	N	Subset for alpha - .05
		1
A	22	12.1818
B	21	12.8571
C	20	13.2500
Sig.		.863

Note:

Means for homogeneous subsets in groups are shown. (1.) Harmonic Mean Sample Size = 20.968. (2.) Group sizes are unequal, so the harmonic mean is used. Type I error levels are not guaranteed.

Homogeneous Subsets: Posttest

Tukey HSD [a b]

Groups	N	Subset for alpha - .05		
		A	B	C
C	20	13.3000		
B	21		30.6364	
A	22			44.2381
Sig.		1.000	1.000	1.000

Table 4.8

Kruskal-Wallis Test

	Groups	N	Mean Rank
PRETEST	A	22	31.00
	B	21	31.88
	C	20	33.22
Total		63	
POSTTEST	A	22	33.68
	B	21	47.81
	C	20	13.55
Total		63	

Note:

Group C pretest rank is larger than Groups A and B at 33.22.
Group B posttest rank is larger than Groups A and C at 47.81.

Test Statistics [a b]

	PRETEST	POSTTEST
Chi-Square	.156	36.202
df	2	2
Asymp. Sig.	.925	.000

Note: [a] Kruskal Wallis Test

[b] Grouping Variable: GROUPS

The groups' sizes were different (22, 21, 20), so Type I error levels cannot be guaranteed. The harmonic mean of the homogeneous subsets had a $\tilde{x}$ = 20.968. This test evaluated the unequal group sizes during analysis to address the problem (Table 4.7, p. 106).

A Kruskal-Wallis Test provided a mean rank of the differences of groups. Ranking the three variables by posttest scores: Group A had a mean rank of 33.50; Group B had a mean rank of 47.81; and the control, Group C, had a mean rank of 13.55. Overall comparison of the three groups depicted a highly significant difference of .0001. There was also found to be a Chi-Square statistical difference of the overall pretest scores of .156, and 36.202 of the overall posttest scores (Table 4.8, p. 107).

In an attempt to account for the non-normal score distribution, bar graphs were developed to show mean gains of pretest to posttest scores for all students in each group. Group A frequency distribution of mean gain scores for each student shows an interesting pattern (Figure 4.4, p. 109). The instructional method, teacher-directed instruction, statistically shows significance when compared to the control group. The bar graph, Figure 4.4, shows that 4 of the 22 students had mean gain scores above 50% correct.

Group B frequency distribution of mean gain scores for each student indicates an almost straight pattern (Figure 4.5, p. 109). The instructional method, computer-assisted instruction, statistically shows significance when compared to the control group. The bar graph, Figure 4.4, shows that 18 of the 21 students had mean gain scores above 50% correct. While both instructional methods demonstrate a significant difference when compared to the control group, the pattern of significance between

Figure 4.4

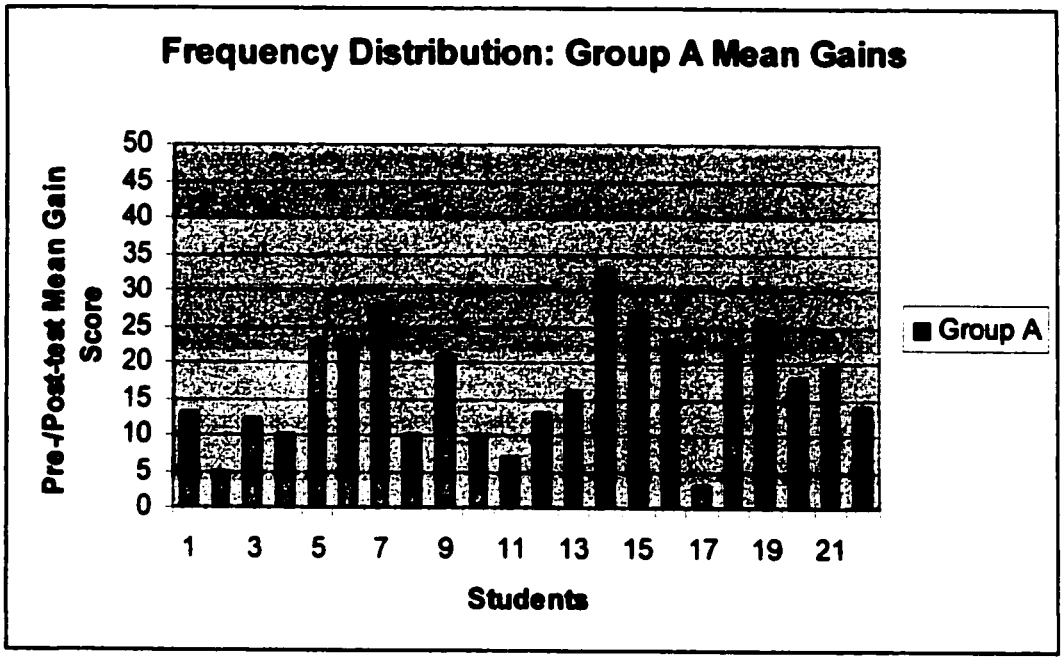
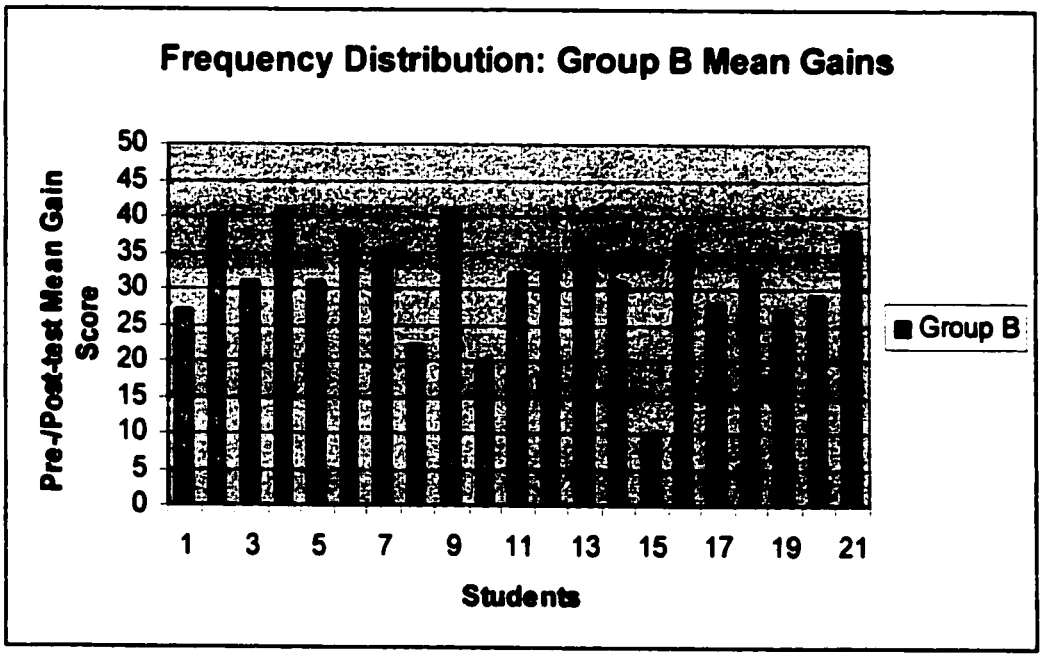


Figure 4.5



Note:

Group A and Group B showed significant difference of .0001 when compared to Group C, the control group. Alpha level = .05

Group A and Group B may be depicting the impact of computer-assisted instruction. In particular, the significance may be in the computer program, Click and Learn Software© (Reynolds, 2002).

Group C frequency distribution of mean gain scores for each student shows a lack of instruction (Figure 4.6, p. 111). Group A and Group B show significant difference when compared to the control group. The bar graph, Figure 4.6, shows that 8 of the 20 students had mean gain scores below zero, and 10 had mean gain scores slightly above zero.

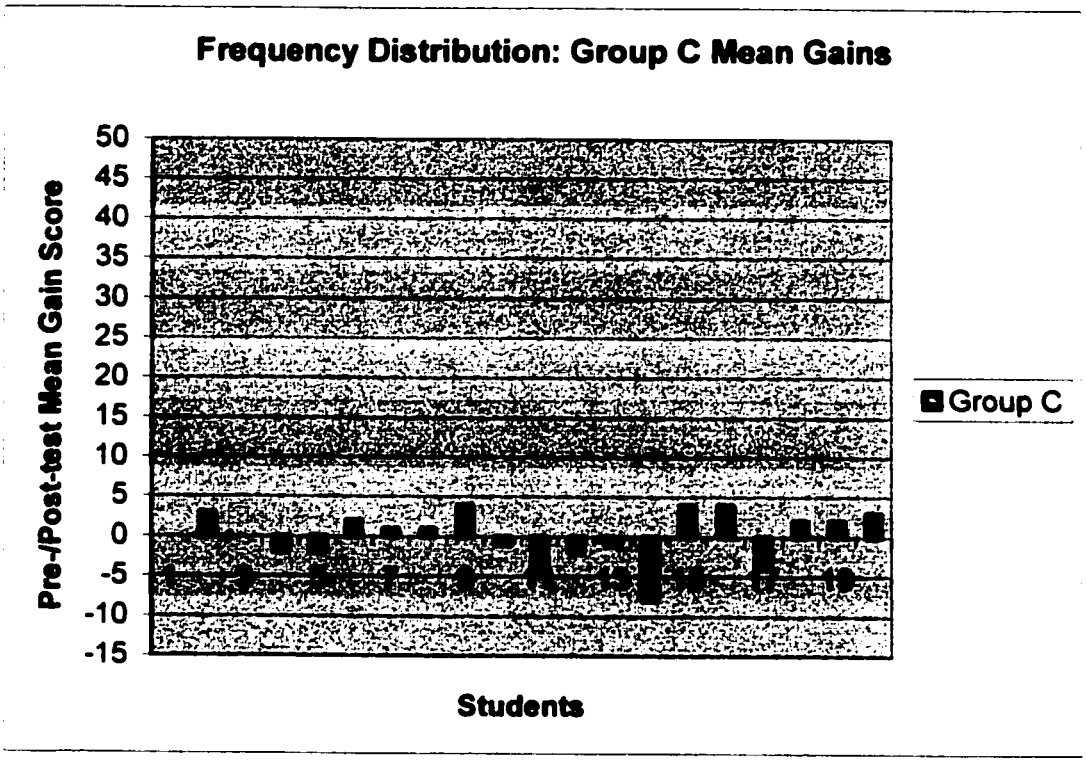
A between groups comparison of pretest to posttest mean score gains is provided in Figure 4.7 (p. 112). Significant mean gain patterns are seen for Group A and Group B. Mean gain patterns for Group C appear to remain the same in the bar graph.

To account further for the abnormal distribution of scores, this investigator believed it was necessary to conduct non-parametric Wilcoxon Signed Ranks Tests between the groups. The test statistics provided significant results since the difference between groups had significance at 95% between pre- and post-test scores. The 2-related-samples tests run through the Wilcoxon provided assumed significant test statistics of .0001 between Groups A and B (Table 4.8, p. 113); assumed significant test statistics of .0001 between Groups A and C (Table 4.9, p. 114); and assumed significant test statistics of .0001 between Groups B and C (Table 4.10, p. 115).

Summary

The first hypothesis questioned whether or not students receiving computer-assisted instruction demonstrated a significant difference between pretest to posttest

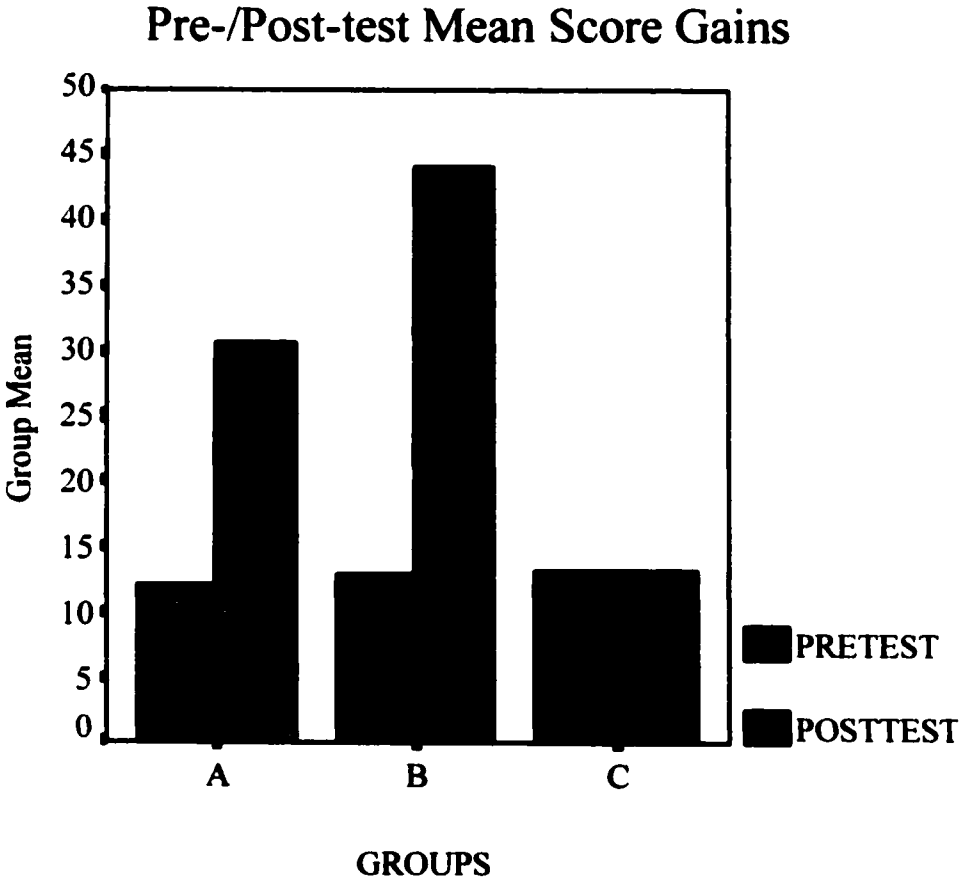
Figure 4.6



Note:

Group C mean gains scores may demonstrate the need for instruction.
Of the 20 students, 8 had mean gain scores less than zero.
Ten students of the 20 had mean gain scores above zero, but less than 5.

Figure 4.7



Note:

n = 63
A = teacher-directed instruction group
Pretest $\bar{x}$ = 12.1818
Posttest $\bar{x}$ = 30.6364
B = computer-assisted instruction group
Pretest $\bar{x}$ = 12.8571
Posttest $\bar{x}$ = 44.2381
C = control group
Pretest $\bar{x}$ = 13.2500 Posttest $\bar{x}$ = 13.3000

Figure 4.8

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POSTTEST - PRETEST	Negative Ranks	0[a]	.00	.00
	Positive Ranks	43[b]	22.00	946.00
	Ties	0[c]		
	Total	43		

a. POSTTEST < PRETEST

b. POSTTEST > PRETEST

c. PRETEST = POSTTEST

Test Statistics[b]

	POSTTEST - PRETEST
Z	-5.713[a]
Asymp. Sig. (2-tailed)	.000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Note:

Comparison of Group A and Group B pretests to posttests scores with nonparametric /two related samples tests.
Significance = .0001

Figure 4.9

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POSTTEST - PRETEST	Negative Ranks	8[a]	10.31	82.50
	Positive Ranks	32[b]	23.05	737.50
	Ties	2[c]		
	Total	42		

a. POSTTEST < PRETEST

b. POSTTEST > PRETEST

c. PRETEST = POSTTEST

Test Statistics[b]

	POSTTEST - PRETEST
Z	-4.406[a]
Asymp. Sig. (2-tailed)	.000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Note:

Comparison of Group A and Group C pretests to posttests scores with nonparametric /two related samples tests.
Significance = .0001

Figure 4.10

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POSTTEST - PRETEST	Negative Ranks	8[a]	9.63	77.00
	Positive Ranks	31[b]	22.68	703.00
	Ties	2[c]		
	Total	41		

a. POSTTEST < PRETEST

b. POSTTEST > PRETEST

c. PRETEST = POSTTEST

Test Statistics[b]

	POSTTEST - PRETEST
Z	-4.371[a]
Asymp. Sig. (2-tailed)	.000

a. Based on negative ranks.

b. Wilcoxon Signed Ranks Test

Note:

Comparison of Group B and Group C pretests to posttests scores with nonparametric /two related samples tests.
Significance = .0001

scores. A one-tailed t-test was run to find that Group B, n = 21, pretest scores had a mean of 12.8571 and the mean of the posttest scores was 44.2381. The pretest and posttest data analysis showed a paired mean difference of –31.3810 and a standard deviation of 7.7426 with a significance of .0001. When comparing between Group B and control Group C through the Tukey post hoc test, there was a mean difference of -.3929 for pretest scores and 30.9481 for posttest scores. Test results revealed that a significant difference of .981 was on pretest scores and a highly significant difference of .0001 was on posttest scores between Group B when compared to Group C. The non-parametric Wilcoxon Signed Ranks Test results showed a z-score of –4.371 and an assumed significance of .0001. The results of the data analysis revealed the significant difference between the pretest to post-test scores for students receiving computer-assisted instruction, as well as to the control group scores. As a result, H_{01} should be accepted, the students receiving computer-assisted instruction did demonstrate a significant difference between pretest to posttest scores.

The second hypothesis questioned whether or not students receiving teacher-directed instruction demonstrated a significant difference between pretest and posttest scores. A one-tailed t-test was run to find that Group A, n = 22, pretest scores had a mean of 12.1818 and the mean of the posttest scores was 30.6364. The pretest and posttest data analysis showed a paired mean difference of –18.4545 and a standard deviation of 8.8357 with a significance of .0001. When comparing between Group A and control Group C through the Tukey post hoc test, there was a mean difference of -1.0682 for pretest scores and 17.3364 for posttest scores. Test results revealed that a significant difference of .863 was on pretest scores and a highly significant difference of

.0001 was on posttest scores between Group A when compared to Group C. The non-parametric Wilcoxon Signed Ranks Test results showed a z-score of –4.406 and an assumed significance of .0001. The results of the data analysis revealed the significant difference between the pre- and post-test scores for students receiving teacher-directed instruction, as well as to the control group scores. As a result, H_{02} should be accepted, the students receiving teacher-directed instruction did demonstrate a significant difference between pretest and posttest scores.

The third hypothesis predicted that there would be a significant difference between the pretest to posttest scores of teacher-directed instruction and computer-assisted instruction. Both methods of instruction in this study showed a significance difference between the pretest and posttest scores. The Tukey post hoc test demonstrated a mean difference in pretest scores of -.6753 between Group A and Group B with a significance of .941. There was a mean difference of –13.6017 on the posttest scores between the two groups, which produced a highly significant value of .0001. As a result of the data analysis, H_{03} should be accepted since significant difference was identified between the pretest to posttest scores of teacher-directed instruction and computer-assisted instruction.

The highly significant results in this study, which appear to have abnormally distributed data, give the investigator reason to suspect that there is a strong indication of significance in normally distributed data. The fact that the relationships between all three groups are extremely significant may mean that there is very little chance that the results would be found by chance alone. The difference between groups is so significant between pretest and posttest scores with alpha set at 95%, it could be significant at the

99%. The significant values of the t-tests, ANOVA, Tukey's post hoc, and non-parametric Wilcoxon Signed Ranks tests strongly suggest the positive impact both methods of instruction have on student learning of geographic place name vocabulary. Caution is needed for interpretation of this data in relation to a larger population without further research.

Students were given the opportunity to participate in a debriefing session with the investigator after the treatment sessions. They answered specific questions [See Appendix G] asked by the investigator. The students gave opinions and asked some questions of their own about the study. Most of the student responses were very positive to both methods of instruction and the geography content. Students in the control group were less opinionated about the content, which may be because they did not receive instruction or feedback to reinforce the importance of the information.

The teachers were given a survey to complete and return to the investigator at a later date. The purpose of the teacher survey [See Appendix G] was for the investigator to discover whether or not there was confusion or comments about the specific directions and expectations of the study. Survey answers could be used for redesigning this research design and project for future studies.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study explored the teaching of elementary geographic place name vocabulary comparing two instructional methods: teacher-directed instruction and computer-assisted instruction. When compared to a control group, both instructional methods showed a significant difference. Acquiring geographic place name vocabulary is important if students are to develop a foundation for understanding maps as they undertake conceptualizing a sense of place and space that support making sense of human and physical events within our world. Place knowledge is a vital part of students learning of social studies content, particularly geographic concepts and perceptions, that can help them to become more conscious of the world around them, prepare to enter a global workplace, and become responsible citizens.

Geographic concepts should be taught in the elementary grade levels to encourage students to build associations of place and locations through maps and other materials. Previous research (Saveland, 1980; Smith, 1986) in the area of geographic place name vocabulary has focused on older students than those in the elementary levels. This study attempted to utilize various parts of those previous studies, such as the vocabulary lists, to determine which instructional method would be more successful for teaching fourth grade students the content information.

It is important for students to develop a knowledge base of specific content if they are to successfully transfer knowledge between different conceptual structures,

higher order thinking procedures, and create new ideas and understanding. Foundational knowledge provides the information, such as facts, vocabulary, details, symbols, and other pieces of information of people, places, and things within a spatial perspective. Without a knowledge base that is continuously expanded, individuals are unable to successfully identify, manipulate, classify, and connect various ideas, thoughts, or other informational elements within a real world context.

Conceptual structures are dependent on the nature of the cognitive processes, which build working relationships between bits of specific information. This study developed from the premise that elementary students should learn geographic place name vocabulary. Student growth in knowledge of basic information from learning the geographic vocabulary will assist them in further developing an understanding of the world around them.

The fourth grade was chosen as the appropriate grade level for learning the content: geographic place name vocabulary of 50 world places. The geographic content taught during the treatment was grade-level appropriate and standards-based material of geographic place name vocabulary identification and location on a map. In the Midwestern part of the United States, most fourth grade lessons include a geography education component in the standards-based social studies curriculum. Three classes total 63 fourth grade students from a suburban, Midwestern, school were selected to complete the study.

The quasi-experimental research design (Campbell & Stanley, 1963) was employed in this study since the students were in pre-assigned classrooms. The research design was pretest, treatment, and posttest. Two classrooms received instruction for

learning to identify and label 50 world places, and one class was the control group. One class of students, Group A, received teacher-directed instruction; another class, Group B, received computer-assisted instruction; and the third class, Group C, received no treatment.

Teacher-directed and computer-assisted instruction treatments were presented 15 minutes a day for 10 days. The teachers who provided the instruction were given detailed scripts. The scripts were written for the three classroom teachers to use as they presented directions for the pretests and posttests. The control group's teacher only received instructions for giving the pre- and post-tests since no instruction was given to the class. Teacher C and the investigator did discuss substitute lesson possibilities other than those related to the treatment content of 50 world places, which she was told to avoid.

An additional script was given to the teacher of Group A, specifying details for the teacher-directed instruction, how to model the instructional procedure for the students, and information as to how to use the overhead maps and charts together. Teacher A reported, in the Teacher Survey:

> "...I know I veered off a bit [from the teacher-directed instruction script], but I interpreted them the best I could and then proceeded taking my class in mind."

Teacher A suggested that an even more detailed and day-by-day script may have been easier to understanding as she was reading and delivering the unfamiliar instruction.

Teacher B had an additional script providing details on entering and manipulating the software program online. The investigator provided training over the

software, as well as some ideas as to how to troubleshoot should problems occur with the program. The teacher providing the computer-assisted instruction thought it was very helpful to complete the computer program herself before attempting to guide the students through the steps online. As Teacher B explained in the Teacher Survey, "I had to do the program on the computer so I could explain (clearly) to the students."

The 3-question student survey included on the pretest place name vocabulary list was inadequate to clearly provide answers to students' attitudes toward geography, computer-assisted instruction, or place name vocabulary [See Appendix A]. As stated in the Pilot Student summary [See Chapter 1], the questions were not written clearly enough for the students to answer clearly. The answers were inconsistent and confusing for the investigator to classify. The survey was included in the main study, but received similar responses to the pilot occurred, so the investigator ignored the student survey answers when evaluating the overall data results.

A debriefing session was conducted with each of the three groups after they took the posttest. This discussion period allowed the students to express their ideas and opinions during an informal question and answer session directed by the investigator. The general list of questions [See Appendix G] provided by the investigator was expanded on the spot as individual students in each group provided details and recommendations depending on the type of instruction.

Conclusions

Computer-assisted instruction, H_{01} :

Data statistics analysis revealed significant differences between the two methods of instruction and the control group. Analysis of the data indicated significant

differences between pretest to posttest scores for computer-assisted instruction, which provided the information required to accept the hypothesis: H_{01} – Students receiving computer-assisted instruction demonstrated a significant difference between pretest and posttest gains. Factors other than the treatment may have contributed to the significant achievement, but the type of instruction appears to have been the major influence for the increased student scores.

One factor is that with computer-assisted instruction, students can work at their own pace and at their own rate. Students feel they have ownership in the program since they are, or have a sense of, manipulating the data as they learn the place name vocabulary quickly.

Another factor that may have contributed to the improved scores is the motivation students felt for using the computer program to quickly learn the geographic place vocabulary. Student excitement and interest in the computer-assisted instruction and the Click and Learn program © (Reynolds, 2002) was expressed during the debriefing session. Teacher B reported, "As I mentioned, the students enjoyed the program. Even the special needs students were successful."

Teacher-directed instruction, H_{02}:

The data for teacher-directed instruction also provided information which supported the hypothesis: H_{02} – Students receiving teacher-directed instruction demonstrated a significant difference between pretest and posttest gains. Other factors than the treatment may have contributed to the significance, but the instructional method contributed to the improved scores. Teacher-directed instruction refers to procedures led by the teacher in the classroom.

Before beginning the teacher-directed instruction, Teacher A changed the sitting routine of her students so they could be easily monitored on the floor instead of at their desks. She was anticipating the students thinking the 15-minutes of teacher-directed instruction would be too long and boring. She anticipated teacher-directed instruction would lead to problem behaviors and negative attitudes from students. By changing the seating arrangement student behaviors became more predictable for the instruction. A couple of students mentioned during the student debriefing session, that they enjoyed having the teacher provide the instruction for them.

Students, during the teacher-directed instruction for both the Pilot Study and the main study, were often attempting to preempt the teacher by saying the vocabulary word before the teacher could say it. The students knew the sequence and wording of the instructions so well they may have been able to conduct the instruction themselves by following what the teacher modeled. Teacher A explained:

> "They [the students] became very comfortable with the drill after the first week... I had them on the floor, in front of the list and screen. I directed the first few and by the end the students were reading and pointing [too]."

When the teaching materials are sequenced, structured, and focused on specific content, teacher-directed instruction has been found to be the most successful teaching method for improving student academic achievement (Chall, 2000; Izumi & Coburn, 2001). As Smith (1986) reported, such instruction tends to develop knowledge to a level that can be called habit. When knowledge allows recall, with little effort on the part of the learner, it has become habituated knowledge.

Teacher-directed or Computer-assisted instruction, H_{03}:

It was necessary to accept the third hypothesis: There will be significant difference between the pretest to posttest gains of teacher-directed instruction and computer-assisted instruction. A significant difference of .0001 was found from the data on all tests that both methods of instruction resulted in more significant difference between pretest and posttests scores than the control group, which received no instruction. The results are specifically related to this study and this population of 63 students. Both methods of instruction were found to be significant for increasing student scores in this study.

Computer-assisted instruction revealed the greatest gains in pretest to posttest scores (Figure 4.5, p. 109). In this study, computer-assisted instruction out performed teacher-directed instruction based on the mean gains of pretest to posttest score gains. Based on results of the study, teachers should focus on using computer programs that aid students in quickly gaining basic, common knowledge. Time compression issues exist in classrooms that impact what subjects are taught, how they are taught, and how in depth they are taught. If students were given the opportunity to utilize quality computer programs, such as Click and Learn Software©, in (and outside) the classroom to learn basic facts and vocabulary, classroom time could be used for more in depth instruction.

Drill has been shown in this study to be a successful mode of practice for fourth grade students learning place name vocabulary, whether a teacher or a computer provides the instruction. The effect of drill instruction on improving student scores based on the pretest to posttest score gains was highly significant in the final data

analysis. Research by Smith (1986) reported a significant influence of teacher-directed instruction and drill for increasing scores from eighth grade students.

Perhaps the computer-assisted instruction was more significant for increasing student scores because students were motivated to work with computers. Student attitudes to computer use were very positive during the debriefing session. They did not view the lessons as repetitive, nor tedious, learning while they used the technology. Credit may be given to the structure of the computer program as a way of explaining student enthusiasm, or it could be that the motivating factor is the manipulation of the computer itself (May, 2001). Riding (1984) suggests that a major advantage for computer use in the classroom is that, depending on the software program, a student can receive immediate feedback as to whether answers or procedures are correct or incorrect. Immediate feedback is a major characteristic of the Click and Learn Software© program (Reynolds, 2002).

There are other aspects of Click and Learn Software© (Reynolds, 2002) that are important to mention. The software program has many structural characteristics that are similar to teacher-directed instruction: highly organized, content specific, incremental, and timed. The software is also extremely flexible in several ways. The program is available through CD-ROM and through the Click and Learn Software© Web site on the Internet. Teachers, or parents, may create their own drills on any topic that lends itself to the program structure. Students are motivated to use the software since they learn the information quickly over a short amount of time. The software challenges students to increase their speed as they learn, to review before learning new information, and to develop strategies that could transfer to other learning areas.

Recommendations for the Future

Instruction

Elementary instruction has evolved over the past century to involve students in their own learning. The instructional practices associated with student-centered learning involve the teacher as a facilitator of learning in the classroom. Characteristic of student-centered learning has been an emphasis of problem solving skills and less drill practice during class activities (Chall, 2000).

In this study, computer-assisted instruction exceeded teacher-directed instruction based on the mean gains of pretest to posttest score gains. Both methods of instruction showed significant difference on pretest to posttest scores, but computer-assisted instruction mean gains were greater. Based on results of the study, teachers should focus on using computer programs that aid students in quickly gaining basic, common knowledge.

Time compression issues exist in classrooms that impact what subjects are taught, how they are taught, and how in depth they are taught. If students were given the opportunity to utilize quality computer programs in, and outside, the classroom to learn basic facts and vocabulary, classroom time could be used for more in depth instruction. Every academic year more expectations and assessments are wove into the school day. With the aid of superior computer programs, such as Click and Learn Software©, students would be motivated to practice and learn a challenging array of facts, vocabulary, and basic information.

Previous studies have examined middle schools where the usual mode of teacher instruction tends to be more traditionally teacher-directed. Elementary teachers, on the

other hand, change teaching strategies throughout the day based on the most effective delivery method in relation to the discipline. Instructional practices in elementary classrooms often adjust as needed, also, depending on the personality type of students, styles of learning, time of year, and a variety of other reasons.

Time of year could have been an important factor, or a contaminant, for this study. Treatments were delivered during the final weeks of school when students were less attentive. Plus, at the end of the school year students have learned and may predict certain instructional procedures that the teacher could utilize during activities. If teacher-directed instruction has not been a method of instruction used during the latter part of the school year, the students may not recognize its effectiveness and influence the teacher's instruction through their behaviors. On the other hand, a teacher's attitude towards teacher-directed instruction may influence students' attitudes.

Instructional practices for teaching content in the classroom have stepped beyond using drill in classroom. Chall (2000) states that social studies instruction in the 20th Century tends to mirror instructional practices for reading, mathematics, and science. At this point in time, the progression of instruction, in the aforementioned disciplines, has evolved from teacher-centered to student-centered instruction.

Teacher A suggested, in a discussion with the investigator, that students could successfully model the teacher-directed instruction procedure. It is possible that the same drill and practice procedure, that in the past was conducted by the teacher, could be performed by individual students modeling teacher behavior in the classroom. This method could involve students in their own learning and promote student leadership skills in front of an audience. It may be possible for fourth grade students to

successfully provide direct instruction of geographic place name vocabulary to their peers.

Teacher B felt encouraged to use the computer-assisted instruction for small periods of time for drill and practice, especially since her students were extremely motivated to complete the lessons quickly. After the 50 World Places program was completed, some of the students were found working on the 50 States program that was included in the Pilot Study, but, for lack of time and duplication of material, not included in the actual study. During the debriefing, the students in this classroom were very confident that their scores would be greatly improved on the posttests.

Scripts

This investigator found it very time consuming writing the scripts for both methods of instruction. The teacher-directed instruction was written in two ways: 1.) a very incremental and detailed script with day-by-day specific wording, and 2.) a very detailed, yet general script. Script #2 was chosen to use during the research since script #1 appeared extremely long and confusing to the investigator. From the reaction of Teacher A to the detailed, yet general script [#2], it would have been better to have used the more incremental and day-by-day script [#1]. The teacher suggested her reaction to the script was because she was not used to providing teacher-directed instruction of this type.

The computer-assisted instruction was written in detail by the investigator. Unknown to the investigator attempting to write the script, the program director was updating the program. After becoming aware of the confusion, the investigator attempted to clarify the script. Unfortunately, the script also included several additional

steps, which proved to be confusing to Teacher B. It became very important for the teacher to complete the program herself in order to clear up any confusion between the actual program and the script. Teachers and investigators should always preview a computer program before including it as part of classroom instruction in order to more clearly understand procedures and to develop problem solving skills from working with the program, which will help when troubleshooting should problems occur, especially online. It is equally important as the investigator to have direct contact with anyone associated with the online program. In this case, the investigator emailed the program director to make him aware that no changes could be made during the period of time treatment was provided in the schools.

Time on Task

During all the debriefing sessions, students stated that they believed 15 minutes was too long a time for drill over the geographic place name vocabulary. The teachers had different opinions on the amount of time on task. The teacher monitoring the computer-assisted instruction thought the students only needed 10 minutes on task. On the other hand, the teacher providing the teacher-directed instruction stated:

> "It [15 minutes] was just about right. . .Students need that much time to get into a rhythm and they easily attend for that long---not much longer."

Group A students did not mind repeating the previous day's vocabulary before progressing to the next group of place names. They believed it was important. One student said he was not worried about studying the place names at home or at school because he knew the places would be repeated during the instructional session. The daily repetition helped him feel he was learning the place names successfully. Group B

students did not mind using the computer for 15 minutes, but felt 15 minutes on the same program was a bit too long. The structure of the computer program was quickly learned and utilized by the students.

Technology in the Classroom

Daily, more technology has been introduced into elementary classrooms. Current trends promote utilizing computers in the classroom through word processing and research on the Internet (Tiene & Ingram, 2000). Geographic education promotes using computers in the classroom for increasing map skills, collecting and organizing data, as well as creating presentations (Walsh, 1992).

Research has been conducted about drill and practice instruction in elementary classrooms for improving reading and mathematics skills, yet little exists to support social studies instruction in younger grade levels. This study has reported the significance of increased student learning when utilizing computers for teaching geographic place name vocabulary. Future research may want to consider other foundational social studies knowledge that could be learning through drill and practice computer-assisted instruction.

Computer-assisted instruction may or may not be an option for future studies in all elementary schools. On one hand, cuts in state and local support may limit accessibility to technology, especially connection to the Internet. If computer-assisted instruction is an option, it is extremely important that the computer program is previewed, not once but several times. Familiarity with the computer program and any online considerations or additional software is very important for the instruction to be successful. It is also necessary to know the technological skill level of the students

involved in the instruction. If the students are not familiar with using the computer online, keyboarding skills, and thousands of other elements, then the motivation to utilize the computer for instruction may not exist.

Click and Learn Software ©

Click and Learn Software© (Reynolds, 2002) is a quick and efficient instruction method of teaching geographic place names to individuals while promoting geographic education. This software was recently established online, keeping the drill and practice tutorial format. The program gives all directions to the student after initial software installation instructions.

The program consists of a variety of characteristics that could assist students in memorizing large quantities of information in a brief amount of time. Through a series of fast-paced and timed drills, students constantly review and repeat pieces of information. Usually the information is grouped in series of seven or eight elements. Students use the computer mouse to click on small square boxes located on the unlabeled elements in their correct location. The maps included in the software program are randomly colored. The color appears to assist student learning of location. Individuals may use the software as briefly as 15-minutes to learn the information. There was a highly significant increase in student pre- to post-test scores from the computer-assisted instruction. In this case the computer-assisted instruction was the online version of the Click and Learn Software© (Reynolds, 2002) program. The success of the program in this study encourages this investigator to recommend that research be conducted to identify the long-term benefits of learning via Click and Learn Software© program.

Maps

Maps are tools utilized by individuals as they attempt to understand their world. There exists a vast variety of maps available in all sizes, types, formats, and from a variety of sources. Golledge (1999) states two basic purposes of maps: 1.) to encode known and remembered information about a place, and 2.) to assist in wayfinding. Both purposes are important for an individual to develop an understanding of the world; both purposes require an individual build a mental map of the environment.

By encouraging research of maps and their related cognitive processes, important map principles and concepts may be taught more often in the early grade levels. If students receive early instruction by creating maps and locating place names, then their skills will increase for reading and interpreting maps (Leinhardt, Stainton, & Bausmith, 1998).

Standards-based Curriculum

The national standards were developed as guides for classroom instruction and provide benefits for students in a variety of ways. Standards have been found to provide a sequenced and detailed explanation of important content for each grade level (Hope, 1996). Teachers may now provide standards-based instruction, which challenges students to meet the standards to expand their learning and measuring accountability (GESP, 1994). The standards were defined to provide comprehensive instruction for the individual disciplines of social studies, even though several of the disciplines, such as geography, have published content-specific national standards. The combination of technology-based standards and content-based standards are recognized as important

ingredients for student learning, yet there is a need to review the impact of technology on improving student academic success and demonstrating it through assessment scores.

Final Summary of Study

This study demonstrated the significance of two successful instructional methods for teaching elementary students geographic place name vocabulary. Both teacher-directed and computer-assisted instruction were found to produce significant pretest to posttest score gains when compared to the control group pre- to post-test gains. Computer-assisted instruction was found to be the most effective method of instruction based on the large gain in pretest to posttest gain scores.

Implications for the Field of Education

Future research may focus on instructional methods, such as teacher-directed or computer-assisted instruction, which are successful for teaching students to quickly learn specific content and facts. If the students learn facts quickly, then more class time may be invested in teaching higher order thinking skills, which are emphasized in current standards-based curriculum (GESP, 1994; ISTE, 2000; NCSS, 1994). Geographic place name vocabulary, in particular, has a vital position in the common knowledge that all citizens of a global society should know. This investigator suggests that students are motivated to learn facts, and they should be given the opportunity to learn them during their early school years, not just from a trivia show on television.

Technology has become more prevalent in USA classrooms than it has been in the past. Teachers and administrators take the selection of expensive software programs very seriously as they strive to satisfy instructional goals, assess objectives, and meet curriculum standards. Geographic education has been promoting the use of geographic

information systems [GIS] to provide students with higher level thinking opportunities. Research encourages the use of GIS technologies in the classroom at various grade levels (Audet & Ludwig, 2000). Additional research would be useful for determining whether or not computer-assisted drill and practice software could support GIS projects in the elementary classroom. Teachers should be provided technology training on up-to-date hardware and software of all types. They should receive training on how to structure social studies lesson activities to include computer-assisted instruction using quality software packages and on the Internet.

This study builds on past research (Saveland, 1980; Smith, 1986), which stresses the importance of learning geographic place name vocabulary. Teacher-directed and computer-assisted instruction have been the focus of various reading and mathematic research, yet little has been found relating to social studies curriculum. It is necessary to identify through research the importance of choosing the appropriate instruction for students to successfully learn specific social studies or geography facts, concepts, skills, and perspectives. In this study, both methods of instruction had a significant difference on the pretest to posttest scores. Computer-assisted instruction impacted increased scores more than teacher-directed instruction. This investigator believes the main influence on the increased scores from computer-assisted instruction resulted from the use of Click and Learn Software© (Reynolds, 2002).

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APPENDIX A

CORRESPONDENCE

University Research
Compliance Office
1 Fairchild Hall
Manhattan, KS 66506 - 1107
785-532-3224
Fax: 785-532-3235
http://www.ksu.edu/research/

TO: Denise Salsbury
Elementary Education
261 Bluemont

Protocol Number: 2481

FROM: Rick Scheidt, Chair
Institutional Review Board Committee

DATE: March 8, 2002

RE: Institutional Review Board Protocol Entitled, "Comparing Teacher-Directed and Computer-Assisted Instruction for Teaching Geographic Place Name Vocabulary to Elementary Students."

The Institutional Review Board Committee (IRB) for Kansas State University has reviewed the protocol identified above, and requests that you address the stipulations below:

- Please clarify the mental/physical disability status of the subjects.
- Please secure signatures of all non-affiliated investigators. Our website offers a form to help facilitate this - http://www.ksu.edu/research/human/invagree.pdf.
- Please assure in informed consent that the subjects are aware that they may choose not to participate and that the subjects may withdraw without penalty.
- Two parental signatures are not necessary, as 45CFR 46:404 applies.

Please address these stipulations, amend the protocol application as appropriate, and return it to the University Research Compliance Office, 1 Fairchild Hall. The IRB will review your changes and respond accordingly.

Conducting this research without final approval from the committee is a violation of University policy as well as federal regulations.

TO: Rick Scheidt, Chair
Institutional Review Board Committee

Protocol Number: 2481

FROM: Denise E. Salsbury

DATE: 3/13/02

RE: Institutional Review Board Protocol entitled, "Comparing Teacher-Directed and Computer-Assisted Instruction for Teaching Geographic Place Name Vocabulary to Elementary Students."

Stipulations addressed below:

1. The mental/physical disability status of students [Human Subjects Research Protocol Application Form, x. Subject Information, c.] statement was checked "yes" based on basic demographic information of normal classrooms within the selected school district where the pilot study and research study will take place. General demographic data of the school district depicts the majority of students are classified having "normal" characteristics; there are also small populations (of varying sizes) within the district defined as minority, 'at risk,' autistic, hearing impaired, sight impaired, learning disabled, and behavior disordered. One of the schools participating in the research study houses an autistic program. Contact with the classroom teachers, school principals, and students is subject to district approval, which is based on approval from the Institutional Review Board. Until that time no specific demographic information is available.

2. Signatures of non-affiliated investigators are unavailable at this time, since contact with the classroom teachers, school principals, and students is subject to district approval, which is based on approval from the Institutional Review Board. The three classroom teachers participating in the research had been identified before learning of the district requirements of no contact; upon receiving approval, two other classroom teachers will be identified to participate in the pilot study. Upon receiving approval from both institutions, signatures will be obtained and Human Subjects on-line training will occur. (A copy of the school district policy form has been attached for review.)

3. See revised informed consent form (attached).

4. See revised informed consent form (attached).

University Research
Compliance Office
1 Fairchild Hall
Manhattan, KS 66506-1107
785-532-3224
Fax: 785-532-3235
http://www.ksu.edu/research/

TO: Denise Salsbury
Elementary Education
261 Bluemont

Proposal Number: 2481

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: March 21, 2002

RE: Approval of Proposal Entitled, "Comparing Teacher-Directed and Computer-Assisted Instruction for Teaching Geographic Place Name Vocabulary to Elementary Students."

The Committee on Research Involving Human Subjects has reviewed your proposal and has granted full approval.

In giving its approval, the Committee has determined that:

☒ There is no more than minimal risk to the subjects.
☐ There is greater than minimal risk to the subjects.

This approval applies only to the proposal currently on file. Any change affecting human subjects must be approved by the Committee prior to implementation. All approved proposals are subject to continuing review at least annually, which may include the examination of records connected with the project. Injuries or any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Prior to involving human subjects, properly executed informed consent must be obtained from each subject or from an authorized representative, and documentation of informed consent must be kept on file for at least three years after the project ends. Each subject must be furnished with a copy of the informed consent document for his or her personal records. The identification of particular human subjects in any publication is an invasion of privacy and requires a separately executed informed consent.

It is important that your human subjects project is consistent with submissions to funding/contract entities. It is your responsibility to initiate notification procedures to any funding/contract entity of any changes in your project that affects the use of human subjects.

TO:

Executive Director of Educational Programming
Lawrence Public Schools
110 McDonald Drive
Lawrence, Kansas 66044

DATE: March 12, 2002

FROM: Denise E. Salsbury, Investigator (KSU Doctoral Candidate)
216 Bluemont Hall
Kansas State University
1100 Mid-Campus Road
Manhattan, Kansas 66506
Office: 785-532-5670

RE: Application to Conduct Research in Lawrence Public Schools

RESEARCH TITLE: "Comparing Teacher-directed and Computer-assisted Instruction for Teaching Geographic Place Name Vocabulary to Elementary Students"

IRB APPROVAL: Pending

INTRODUCTION:

My name is Denise Salsbury, and I am a doctoral student in Curriculum and Instruction at Kansas State University in the Elementary Education Department. With this application, I am asking the Lawrence Public School District for the opportunity to conduct a research study comparing instructional methods of teacher-directed and computer-assisted instruction for teaching geographic place name vocabulary in two elementary schools this spring. The Elementary fourth grade students have been recommended as participants in my research, and I would appreciate the opportunity to include them in my study. I am hoping another school in your district will want to participate in the research Pilot Study.

The Pilot Study will take place for 15 minutes a day and 5 days a week for 2 weeks for a total of 150 minutes. Of the two classrooms required for the pilot, one classroom of students will participate in computer-assisted learning, and one classroom of students will participate in teacher-directed learning. All students will learn geographic place name vocabulary, which is grade level appropriate social studies curriculum. All students will take 2 pretests and 2 posttests.

The Research Study will take place for 15 minutes a day over 24 days (about 4 weeks) for a total of 360 minutes. Of the three classrooms required for the research, one classroom of students will participate in computer-assisted learning, one classroom of students will participate in teacher-directed learning, and the third classroom will be the control group. All students will learn geographic place name vocabulary, which is grade level appropriate social studies curriculum. All students will take 2 pretests and 2 posttests.

All instructional sessions will be videotaped, yet all information gathered during the study will be kept confidential, and participation in the study is on a voluntary basis. You may end participation in the study at any time, for any reason. At the conclusion of the treatments, all study findings will be made available to participants. Cooperation and participation in the research study by your school district personnel, classroom teachers, and students are greatly appreciated.

DESCRIPTION OF THE EXPERIMENTAL PROCEDURES:

This study will compare computer-assisted instruction to teacher-directed instruction for teaching geographic place name vocabulary. A detailed, sequential script will be provided for the teacher-directed instruction. A computer software program, "Click and Learn" (2001), developed by Bob Reynolds, will be utilized for the computer-assisted instruction. The software program incorporates direct instruction strategies via the computer to teach geographic place name vocabulary. All printed materials and CD-ROMs will be provided by the investigator. Teacher-directed and computer-assisted instruction during the study will occur within identically timed segments (15 minutes a day). All participating subjects will receive instruction involving typical, grade level appropriate social studies content at the knowledge base.

The subjects to participate in the study are fourth grade students. The number of subjects in each classroom will vary depending on existing classroom populations. All subjects will receive a pretest and posttest for each area of study: (1.) 50 United States, and (2.) 50 World Places. Instruction in all classrooms during the Pilot Study and Research Study will be documented via video tape.

In the Pilot Study, two classrooms of fourth grade students will participate in the study for 15 minutes a day for 10 days. They will learn to identify the 50 United States and locate them on a map during the first week. The second week, students will identify 50 world places and locate them on a map. The amount of time required for the Pilot Study is 15 minutes a day for 10 days, which is a total of 150 minutes.

In the Research Study, three established classrooms of fourth students will participate in the study. These three classrooms have not participated in the Pilot Study. One classroom of students will receive teacher-directed instruction that has been pre-established within a script. The second classroom of students will receive computer-assisted instruction with the information from a CD-ROM . The third classroom will be the control group. The subjects in the control group will receive no treatment, yet will take a pretest and posttest over the same material at the same time as the other subjects. With the additional days required for taking pre- and post-tests, the amount of time required for the Research Study is 15 minutes a day for 24 days, which is a total of 360 minutes (or 6 hours).

Before treatment begins, the three subject groups will take a pretest at the same time. On the pretest, subjects will be expected to identify and label the location of geographic place names on a map. During treatment, subjects receiving the teacher-directed and computer-assisted instruction will be expected to learn the 50 states of the United States and their locations, then learn the names and locations of 50 world places. Following treatment, the three subject groups will take a posttest. Students will be expected to identify and label the location of places on a map during the posttest.

Classroom teachers will need to provide the supplied teacher-directed and computer-assisted instruction as appropriate for the study. Prior to providing instruction during the study, the teachers will be required to receive on-line training from the KSU IRB web site <http://www.ksu.edu/research/human/>. All instructional materials, such as transparencies, paper copies, and software, will be provided by the investigator.

Requirements for Research:

1. 5 classrooms of fourth grade students
   (preferred: 2 classrooms for Pilot Study at one school site---Unknown at this time, and 3 classrooms for Research Study at another school site--- Elementary)
2. 5 classroom teachers
3. A computer lab at each school site (CDs will be provided)
4. An overhead machine at each site (Transparencies will be provided)
5. A video camera in each classroom (Tapes will be provided)
6. 15 minutes a day for 10 days (Pilot Study)
7. 15 minutes a day for 24 days (Research Study to take place at least one week AFTER Pilot Study)

INFORMED CONSENT DOCUMENT: [See attached forms]

PRE- and POST-TESTS: [See attached forms]

TEACHER SCRIPTS: [See attached forms]

SOFTWARE: If required, a copy of the CD-ROM, "Click and Learn" will be provided to the District for review.

DEBRIEFING STATEMENT:

[To be read to participants following completion of the research study]

I hope you enjoyed learning geographic place name vocabulary. I know you will use your newly gained knowledge throughout the rest of the school year and in the future. By participating in this research study you have helped me understand how fourth graders learn geographic place name vocabulary.

Thank you for your time and assistance.

BENEFITS OF STUDY:

1. The students will be learning grade level and content appropriate information which they will use through the rest of the school year and into the future.
2. A year's free connection to the "Click and Learn" web site is available for the five classrooms at the two school sites, courtesy of Bob Reynolds, owner of "Click and Learn."

ANALYSIS OF DATA: To be provided upon completion of dissertation, September---2002

Kansas State University Committee for Research Involving Human Subjects (IRB)

Unaffiliated Investigator Agreement

Name of Principle Investigator:
Department of Principle Investigator: Phone number:
Name of Unaffiliated Investigator:
Name of Institution Providing IRB Oversight:
OHRP Assurance Number:
Title of Research Proposal Covered by this Agreement:

(1) The above-named Unaffiliated Investigator has reviewed *the Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research* (or other internationally recognized equivalent; see B1 of FWA Terms for institutions outside the United States); the U.S. Department of Health and Human Services (DHHS) regulations for the protection of human subjects at 45 CFR 46 (or other internationally recognized equivalent; see B3 of FWA Terms for institutions outside the United States), the Assurance referenced above, and the relevant institutional policies and procedures for the protection of human subjects.

(2) The Investigator understands and hereby accepts the responsibility to comply with the standards and requirements stipulated in the above documents and to protect the rights and welfare of human subjects involved in research conducted under this Agreement.

(3) The Investigator will comply with all other National, State, or local laws or regulations that may provide additional protection for human subjects.

(4) The Investigator will abide by all determinations of the KSU Committee for Research Involving Human Subjects (IRB) designated under the above Assurance and will accept the final authority and decisions of the IRB, including but not limited to directives to terminate participation in designated research activities.

(5) The Investigator will complete any training required by the IRB prior to initiating research covered under this Agreement.

(6) The Investigator will report promptly to the IRB proposed changes in the research conducted under this Agreement. The investigator will not initiate changes in the research without prior IRB review and approval, except where necessary to eliminate apparent immediate hazards to subjects.

(7) The Investigator will report immediately to the IRB any unanticipated problems in research covered under this Agreement that involve risks to subjects or others.

(8) The Investigator will seek, document, and maintain records of informed consent from each subject or the subject's legally authorized representative as required under HHS regulations (or other international or national equivalent) and stipulated by the IRB.

(9) The Investigator acknowledges and agrees to cooperate in the IRB responsibility for initial and continuing review, record keeping, reporting, and certification. The Investigator will provide all information requested by the IRB in a timely fashion.

(10) In conducting research involving FDA-regulated products, the investigator will comply with all applicable FDA regulations and fulfill all investigator responsibilities (or investigator-sponsor responsibilities, where appropriate), including those described at 21 CFR 312 and 812.

(11) The investigator will not enroll subjects in research under this Agreement prior to its review and approval by the IRB.

(12) Emergency medical care may be delivered without IRB review and approval to the extent permitted under applicable Federal regulations and State law. However, such medical care may not be included as part of Federally-supported research.

(13) This Agreement does not preclude the investigator from taking part in research not covered under the Agreement

(14) The investigator acknowledges that her/his primary responsibility is to safeguard the rights and welfare of each research subject, and that the subject's rights and welfare must take precedence over the goals and requirements of the research.

Signatures:

Investigator _____ Date _____

IRB Institutional Official: _____ Date _____

April 3, 2002

Dear Fourth Grade Parents:

My name is Denise Salsbury and I am a doctorial student at Kansas State University in the Elementary Education Department. I am currently conducting a research project comparing instructional methods of teacher-directed and computer-assisted instruction for teaching geographic place name vocabulary. The fourth grade students of have been recommended as participants in my research, and I would appreciate the opportunity to include them in my study.

Please read the attached page to find out more information about the study. I would appreciate it if your student could participate in the study. I hope to begin the study in the classroom next week.

Please read and return the letter to your fourth grade classroom teacher, whether you give permission for your student to participate or not, by **Friday, April 5, 2002.**

Thank you for your time.

Denise E. Salsbury

Protocol Number: 2481 Date: 4/3/02

Informed Consent Document
Pilot Study

Dear Fourth Grade Parent/Guardian:

Your student is invited to participate in a study comparing teacher-directed instruction and computer-assisted instruction. I hope to learn which instructional method increases student knowledge of geographic place name vocabulary.

Upon giving permission for your student to participate, the study will include the following:

1. Prior to instruction, each student receives a pretest. After all instruction each student will receive a posttest demonstrating gained knowledge of geographic place name vocabulary.
2. One classroom of students will receive computer-assisted instruction via a software program titled "Click and Learn." One classroom of students will receive teacher-directed instruction based from a written script. One classroom of students will receive no instruction at this time concerning the treatment subject matter, yet will take the pretest and posttest.
3. Both classrooms will be videotaped during 15 minutes of the day for a week. No one will see the video except the researcher and the classroom teachers.
4. No physical or emotional risks are involved for the students or teachers participating in the study.
5. If you decide to permit your student to participate in the study, you are free to withdraw your consent and to discontinue participating at any time. The student will not be penalized should you decide not to participate in the study.

You are making a decision whether or not your child will participate in this research study. Your signatures indicate you and your student have decided to participate in the research study understanding that compensation is not available. You are free to withdraw your consent for your student to participate in the study and discontinue participation at any time during study.

If you have any questions or comments at any time, either now or in the future, please contact me: Denise E. Salsbury, 1100 Mid-Campus Road, 216 Bluemont Hall, Kansas State University, Manhattan, Kansas 66506, or (785) 532-5670, or via e-mail [redacted]

I have read the above statements and have been advised of the procedures to be used in this project.

_____ _____
Date Signature of Participant

_____
Signature of Parent or Guardian

APPENDIX B

FORMS: PRETESTS and POSTTESTS

----TEACHER SCRIPT----
[Study]

"50 World Places" -- PRETEST

Directions

1. Give each student one page of Pretest--"50 World Places" Place Name List and one Pretest--"50 World Places" Map.

2. Advise students to put their name on both papers.

3. Ask them to answer the three survey questions at the bottom of the "list" page the best they can NOW. Give them a couple of minutes to complete these before continuing with directions for pretest.
   - Questions 1 and 3 are opinion pages.
   - It is okay for you to provide an example of when they have done geography in the classroom.
   - Question 2 is asking for how many total minutes a day a student works/plays with a computer. Do not spend much time on this question. Have students guess if they have no idea. It is okay to put zero (0) if they do not think they use a computer on a day.

4. After a couple of minutes, point out to students that one page has a list of 50 world places and the other page is a map of the world.

5. Get the students' attention, then ask them to read the directions silently as you read them aloud:
   "Place the number of the World Place from the alphabetical list onto the correct map location. If there is no room for the number, draw a line from the location and put the number on the line."
   "You have 15 minutes to complete as much of the test as you can."
   Are there any questions?"

3. Tell students to turn in the map and the place name list at the end of 15 minutes.

4. Then say, "I will set the timer NOW. You may begin."

5. Teacher: When students turn in the two papers, please make sure the student name is on BOTH pages, then staple the papers together. Thanks.

PRETEST

"50 WORLD PLACE NAMES"

Student number _____ Gender F / M Age _____ Date _____

DIRECTIONS:
Place the number of the World Place from the alphabetical list onto the correct map location.

18. Algeria
19. Arctic Ocean
20. Argentina
21. Atlantic Ocean
22. Australia
23. Beijing (Peking)
24. Brazil
25. Buenos Aires
26. Cairo
27. Calcutta
28. Canada
29. Caribbean Sea
30. Chile
31. China
32. Colombia
33. Cuba
34. Democratic Republic of Congo (Zaire)

18. Egypt
19. Ethiopia
20. France
21. India
22. Indian Ocean
23. Indonesia
24. Iran
25. Italy
26. Japan
27. Johannesburg
28. London
29. Mediterranean Sea
30. Mexico
31. Mexico City
32. Moscow
33. New York City

34. Nigeria
35. Paris
36. Peru
37. Philippines
38. Poland
39. Rio de Janeiro
40. Russia (USSR)
41. Saudi Arabia
42. South Africa
43. Spain
44. Sweden
45. Sydney
46. Tokyo
47. Turkey
48. United Kingdom (England)
49. United States
50. Yugoslavia

Answer the following questions:

- How do you feel about using a computer? (check one)

___ I love computers. ☺ ___ I think computers are okay. 😐 ___ I do not like computers. ☹

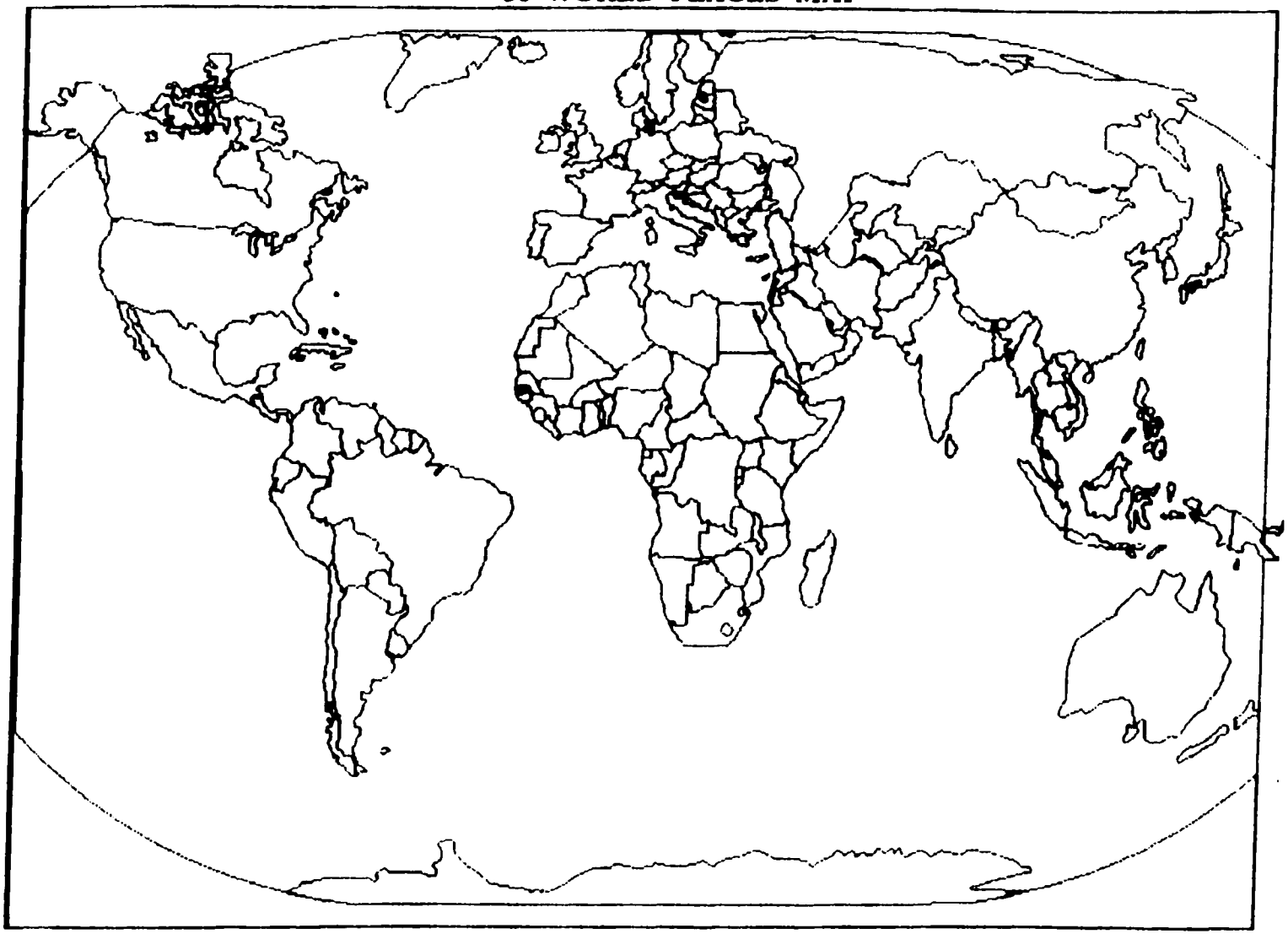
- How much time do you use a computer each day?

Monday ___ Tuesday ___ Wednesday ___ Thursday ___ Friday ___ Saturday ___ Sunday ___

- How do you feel about learning geography? (check one)

___ Geography makes me excited. ☺ ___ Geography is okay. 😐 ___ Geography is not good. ☹

---- 50 WORLD PLACES MAP ---- Pretest



Student Name: _____

----TEACHER SCRIPT----
[Study]

"50 World Places" -- POSTTEST

Directions

1. Give each student one page of Posttest--"50 World Places" Place Name List and one Posttest--"50 World Places" Map.

2. Advise students to put their name on both papers. There will not be survey questions to answer.

3. Remind students that one page has a list of 50 world places and the other page is a map of the world.

4. Get the students' attention, then ask them to read the directions silently as you read them aloud:
   "Place the number of the World Place from the alphabetical list onto the correct map location. If there is no room for the number, draw a line from the location and put the number on the line."
   "You have 15 minutes to complete as much of the test as you can."
   Are there any questions?"

5. Tell students to turn in the map and the place name list at the end of 15 minutes.

6. Then say, "I will set the timer NOW. You may begin."

7. Teacher: When students turn in the two papers, please make sure the student name is on BOTH pages, then staple the papers together. Thanks.

POSTTEST

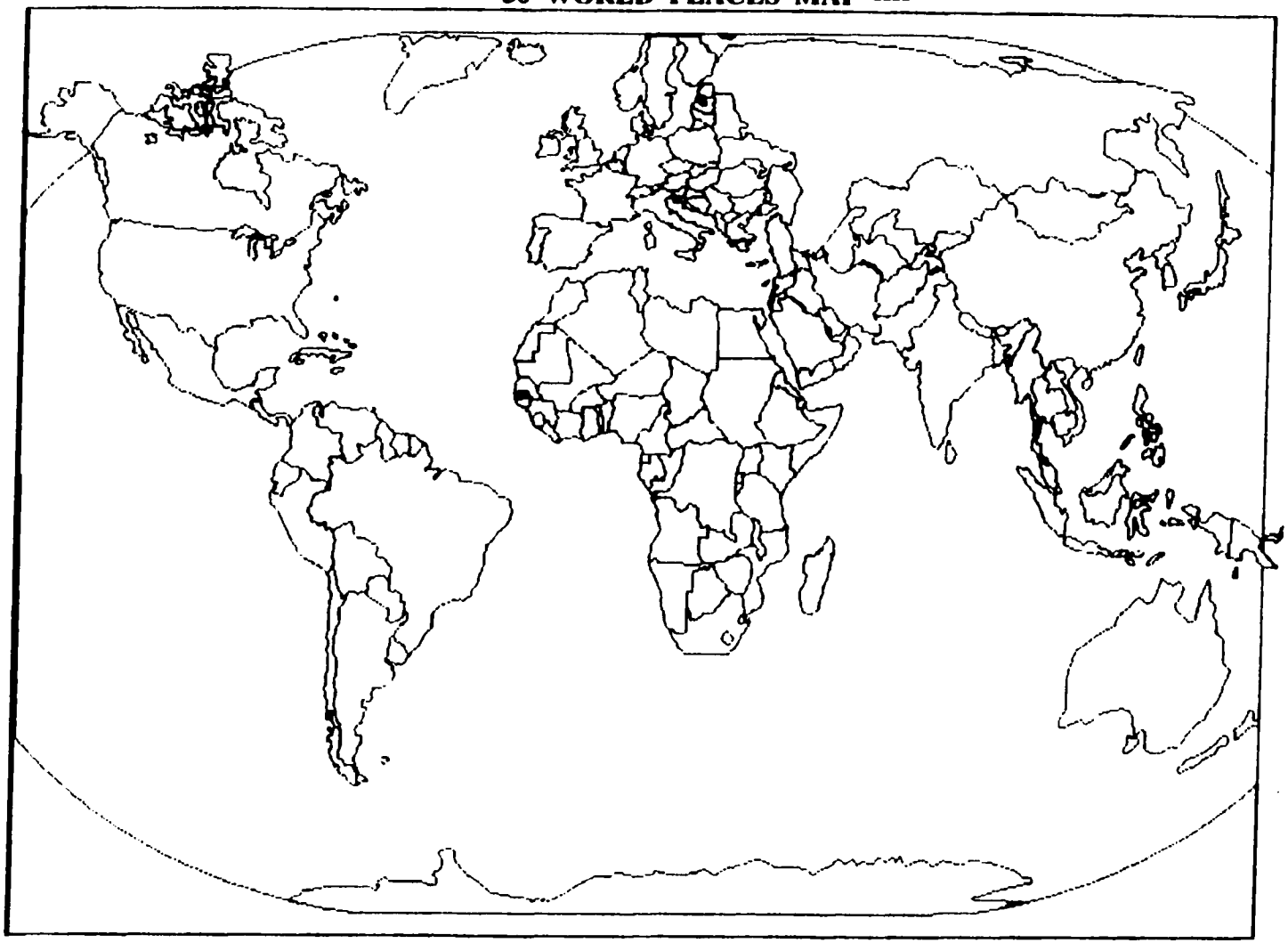
"50 WORLD PLACE NAMES"

Student number _____ Gender F / M Age _____ Date _____

DIRECTIONS:
Place the number of the World Place from the alphabetical list onto the correct map location.

1. Algeria
2. Arctic Ocean
3. Argentina
4. Atlantic Ocean
5. Australia
6. Beijing (Peking)
7. Brazil
8. Buenos Aires
9. Cairo
10. Calcutta
11. Canada
12. Caribbean Sea
13. Chile
14. China
15. Colombia
16. Cuba
17. Democratic Republic of Congo (Zaire)
18. Egypt
19. Ethiopia
20. France
21. India
22. Indian Ocean
23. Indonesia
24. Iran
25. Italy
26. Japan
27. Johannesburg
28. London
29. Mediterranean Sea
30. Mexico
31. Mexico City
32. Moscow
33. New York City
34. Nigeria
35. Paris
36. Peru
37. Philippines
38. Poland
39. Rio de Janeiro
40. Russia (USSR)
41. Saudi Arabia
42. South Africa
43. Spain
44. Sweden
45. Sydney
46. Tokyo
47. Turkey
48. United Kingdom (England)
49. United States
50. Yugoslavia

---- 50 WORLD PLACES MAP ---- Posttest



Student Name: _____

APPENDIX C

SCRIPT: TEACHER-DIRECTED INSTRUCTION

RESEARCH STUDY TIMELINE – Teacher-directed Instruction

Week before study begins: Send Parental Consent Form home with students
Set due date for Parental Consent Forms
---Classroom teachers and Investigator meet
---Investigator provides training & materials
---Student treats provided by investigator as reward for returning consent forms

Day 1 of Research Study Treatment: Give PRETEST.
(Last day for accepting consent forms.)

Day 2 of Research Study Treatment: Give Instruction.

Day 3 of Research Study Treatment: Give Instruction.

Day 4 of Research Study Treatment: Give Instruction.

Field Day: No treatment provided

Grade Level Field Trip: No treatment provided

Day 5 of Research Study Treatment: Give Instruction.

Day 6 of Research Study Treatment: Give Instruction.

Day 7 of Research Study Treatment: Give Instruction.

Day 8 of Research Study Treatment: Give Instruction.

Day 9 of Research Study Treatment: Give Instruction.

Day 10 of Research Study Treatment: Give Instruction.*

Day 11 of Research Study Treatment: Give POSTTEST.*

Final full day of school

Final half day of school

----TEACHER SCRIPT----

Teacher-directed Instruction

REQUEST: Teachers, please provide no additional instruction on the following content over 50 World Places during the days students are receiving treatments.

TREATMENT SECTIONS: (In order of instruction)
GOAL: To cover as much content as possible.

Part 1: Pre-Assessment

Part 2: Content ---50 World Places

- Section 1: "World Place Names" ("Countries" & "Oceans, Seas, & Cities") – Color map
  1a. "Countries"—Drill in alphabetical order.
  1b. "Oceans, Seas, & Cities"—Drill in alphabetical order.
  2a. "Countries"—Drill in random order.
  2b. "Oceans, Seas, & Cities"—Drill in random order.

- Section 2: "World Place Names" ("Countries" & "Oceans, Seas, & Cities")– Blackline/White map
  1a. "Countries"—Drill in alphabetical order.
  1b. "Oceans, Seas, & Cities"—Drill in alphabetical order.
  2a. "Countries"—Drill in random order.
  2b. "Oceans, Seas, & Cities"—Drill in random order.

Part 3: Post-Assessment

MATERIALS:
--Overhead projector, pen, and screen
--Video camera, tripod, and videotape
--Pointer
--Timer

--Pretest:
1. Part 1--50 World Places (map & list)

--Posttest:
1. Part 1--50 World Places (map & list)

--Transparenies:
1. Color World map
2. Blackline World map
3. 50 World Place Names lists:
   --Alphabetical
   --Random, List 2A (& 2B, 2C, 2D)

SCRIPTS and PROCEDURES

Part 1: PRETEST

1. Day 1---See Pretest Script
2. Students will be instructed to identify 50 World Places on an unlabeled, blackline World map by putting the corresponding number from the place list on the correct location.
3. Students have 15 minutes to complete the pretest.

TREATMENT:

A. Daily Procedures, Part 1-----/Section 1/Section 2/

1. Have overhead projector, screen, and an overhead pen ready to use during treatment.

2. Have video camera powered and positioned with video tape in machine.

[NOTE: During Section 1 of instruction, use the first word in /pairs/. For Section 2, use the second word in the /pairs/.]

3. Teacher will be positioned in front of the group of students beside the overhead projector showing an unlabeled /color/blackline/ map transparency of the World.

4. Start the video camera at the beginning of each 15-minute session.

5. Set the timer for 15 minutes.

6. TREATMENT PROCEDURE----Continue instruction as needed during time limit. [See Daily Script]
   [1.] Teacher points to a place name on the chart, and says the name aloud.
   [2.] Teacher points to the place location on the color/blackline World map (on the overhead transparency), and says the place name aloud.
   [3.] Teacher asks students to repeat the place name after her.
   [4.] Students provide a choral response for the state name.
   [5.] Teacher and students repeat treatment process as time allows (stop instruction at the end of 15 minutes).

B. Teacher-directed Instruction:

1. Section 1: Cover content sequence during instruction sessions.
   Use color World map transparency for 1a, 1b, 1c, and 1d drills.
   --1a. "Countries"—Drill in alphabetical order.
   --1b. "Oceans, Seas, & Cities"—Drill in alphabetical order
   Then:
   --2a. "Countries"—Drill in random order.
   --2b. "Oceans, Seas, & Cities"—Drill in random order.

INTRODUCTION SCRIPT: (use first word in /pairs/)

2. DAY 2----Begin Section 1 instruction: Alphabetical Lists, 1A and 1B.
   Use a color World map transparency.
   During instruction, use the first word in /pairs/.

Teacher begins with the following introduction:

- "I am going to teach you to identify and locate on a map 50 World Places in /alphabetical/random/ order.
- I will repeat the procedure over and over until you have learned all 50 places.
- This is the procedure:
  First, I will point to the place name on the chart.
  Second, I will point to the place and its location on the map, and say its name.
- Then I will ask YOU to repeat the place name."

3. DAY 3 through DAY 10—There are two (2) script procedures after the first day of instruction.
   ---First, use REVIEW SCRIPT to quickly review place names learned the previous day.
   ---Then, use the DAILY SCRIPT to teach the next place names.

[NOTE: Students may anticipate the word you are going to read or say, as they would in primary reading procedures. Ask them not to predict the word and say it aloud, instead they should try to get into the pattern and rhythm of this script.]

REVIEW SCRIPT:

- Tell students:
  "We are going to quickly review the places you learned yesterday.
  I will point to the location of the place on the map.
  Then I want all of you to repeat the place name out loud and together.
- Quickly review ALL places learned so far. Then proceed to DAILY SCRIPT.

DAILY SCRIPT:

4. Use appropriate place name list for sequence of place names during instruction.
5. Begin with Alphabetical list, then progress to Random lists as time restrictions permit.

- Point to place name on the chart, and say:
  "This place name is _(example: Algeria)."
- Continue instruction during session, as time allows, by pointing to the corresponding place on the world map, and saying:
  "This is the location of _(example: Algeria)."
  "Now, (all students) repeat the place name after me: _(choral response example: Algeria) ."
- Point to place name on the chart, according to the list, and say:
  "The next place name is _(example: Argentina) .

- Continue instruction during session, as time allows, by pointing to the corresponding place on the world map, and saying:
  "This is the location of _(example: Argentina)."
  "Now, (all students) repeat the place name after me: _(choral response example: Argentina) _."
- Continue instructional process until time is up.

6. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

7. If all 50 places have NOT been covered alphabetically, continue to repeat Review Script and Daily Script as needed during each instruction session until all 50 World Places have been covered in alphabetical order.

8. If all 50 world places have been covered alphabetically, change to random lists, beginning with List 2A and progressing to List 2B. See step #9.

9. CHANGE to Section 1: Random Lists 2A and 2B. Use color transparency.

10. Continue Teacher-directed instruction from steps #2 to #8.

11. AFTER completing instruction of Random Lists 2A and 2B with color map transparency, change back to alphabetical lists to begin Section 2 with 1A, Countries. See step #12.

12. CHANGE to Section 2: Alphabetical Lists, 1A and 1B. Use the blackline World map transparency. During instruction, use the second word in /pairs/.

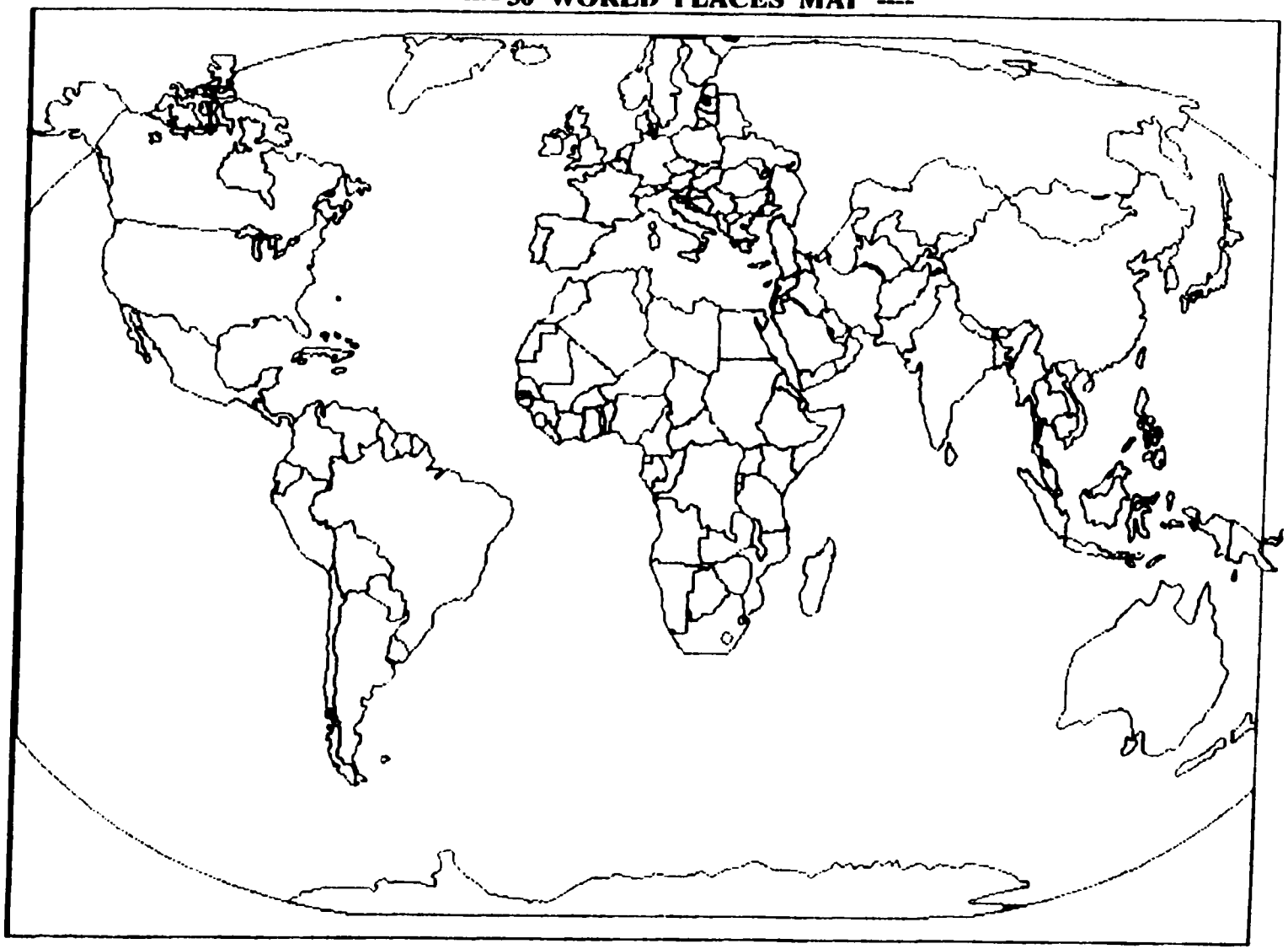
13. Repeat Review Script and Daily Script as needed until all 50 World Places have been covered in Alphabetical order, and then in Random order (at least one list). [As time allows]

12. When instruction for all 50 World Places, alphabetical and random, have been completed, or research is over, proceed to give 50 World Places Posttest.

Part 3: POSTTEST

1. Day 11---See Posttest Script
2. Students will be instructed to identify 50 World Places on an unlabeled, blackline World map by putting the corresponding number from the place list on the correct location.
3. Students have 15 minutes to complete the pretest.

---- 50 WORLD PLACES MAP ----



50 WORLD PLACE NAMES-----Alphabetical List
----Teacher----

COUNTRIES

Set 1a:

Algeria
Argentina
Australia
Brazil
Canada
Chile
China

Set 2a:

Colombia
Cuba
Democratic Republic of Congo
Egypt
Ethiopia
France
India

Set 3a:

Indonesia
Iran
Italy
Japan
Mexico
Nigeria
Peru

Set 4a:

Philippines
Poland
Russia
Saudi Arabia
South Africa
Spain
Sweden

Set 5a:

Turkey
United Kingdom
United States
Yugoslavia

OCEANS, SEAS, & CITIES

Set 1b:

Arctic Ocean
Atlantic Ocean
Beijing
Buenos Aires
Cairo
Calcutta
Caribbean Sea

Set 2b:

Indian Ocean
Johannesburg
London
Mediterranean Sea
Mexico City
Moscow
New York City

Set 3b:

Paris
Rio de Janeiro
Sydney
Tokyo

50 WORLD PLACE NAMES——Random List, #2A
——Teacher——

COUNTRIES

Set 1a:
- Japan
- Yugoslavia
- Philippines
- United States
- Brazil
- Mexico
- Peru

Set 2a:
- South Africa
- Sweden
- Australia
- Canada
- Cuba
- Congo
- Ethiopia

Set 3a:
- Turkey
- Iran
- Saudi Arabia
- Algeria
- India
- Russia
- Nigeria

Set 4a:
- Colombia
- Italy
- Poland
- Chile
- Argentina
- Spain
- China

Set 5a:
- United Kingdom
- France
- Egypt
- Indonesia

OCEANS, SEAS, & CITIES

Set 1b:
- Atlantic Ocean
- Indian Ocean
- Rio de Janeiro
- Paris
- Sydney
- Arctic Ocean
- Tokyo

Set 2b:
- Cairo
- Caribbean Sea
- Beijing
- London
- Buenos Aires
- Mexico City
- New York City

Set 3b:
- Moscow
- Mediterranean Sea
- Johannesburg
- Calcutta

50 WORLD PLACE NAMES——Random List, #2B
——Teacher——

COUNTRIES

Set 1c:
- Yugoslavia
- France
- United States
- Democratic Republic of the Congo
- United Kingdom
- Japan
- Poland

Set 2c:
- Algeria
- Russia
- Sweden
- Philippines
- Turkey
- Ethiopia
- Peru

Set 3c:
- Spain
- Egypt
- India
- Argentina
- Brazil
- Saudi Arabia
- Colombia

Set 4c:
- Italy
- Indonesia
- China
- Nigeria
- Mexico
- Australia
- Chile

Set 5c:
- Cuba
- South Africa
- Iran
- Canada

OCEANS, SEAS, & CITIES

Set 1d:
- Indian Ocean
- Mexico City
- Calcutta
- Beijing
- Caribbean Sea
- Paris
- Johannesburg

Set 2d:
- Moscow
- London
- Tokyo
- New York City
- Mediterranean Sea
- Buenos Aires
- Rio de Janeiro

Set 3d:
- Cairo
- Atlantic Ocean
- Arctic Ocean
- Sydney

50 WORLD PLACE NAMES——Random List, #2C
——Teacher——

COUNTRIES

Set 1e:
- Mexico
- France
- Saudi Arabia
- Canada
- Yugoslavia
- Argentina
- South Africa

Set 2e:
- Peru
- Indonesia
- Australia
- Colombia
- United States
- Democratic Republic of the Congo
- China

Set 3e:
- Algeria
- Chile
- Russia
- Cuba
- Poland
- Turkey
- Spain

Set 4e:
- Italy
- Brazil
- Egypt
- Sweden
- United Kingdom
- Philippines
- Nigeria

Set 5e:
- Japan
- Iran
- India
- Ethiopia

OCEANS, SEAS, & CITIES

Set 1f:
- Cairo
- Beijing
- New York City
- Calcutta
- Arctic Ocean
- Buenos Aires
- London

Set 2f:
- Moscow
- Atlantic Ocean
- Tokyo
- Caribbean Sea
- Mediterranean Sea
- Paris
- Johannesburg

Set 3f:
- Mexico City
- Indian Ocean
- Rio de Janeiro
- Sydney

50 WORLD PLACE NAMES——Random List, #2D
——Teacher——

COUNTRIES

Set 1g:
- Japan
- Indonesia
- Argentina
- United States
- Mexico
- Australia
- Turkey

Set 2g:
- Canada
- Egypt
- Russia
- Philippines
- Ethiopia
- Chile
- Peru

Set 3g:
- South Africa
- Saudi Arabia
- China
- Colombia
- United Kingdom
- Cuba
- Brazil

Set 4g:
- Yugoslavia
- Italy
- India
- France
- Poland
- Iran
- Algeria

Set 5g:
- Sweden
- Spain
- Nigeria
- Democratic Republic of the Congo

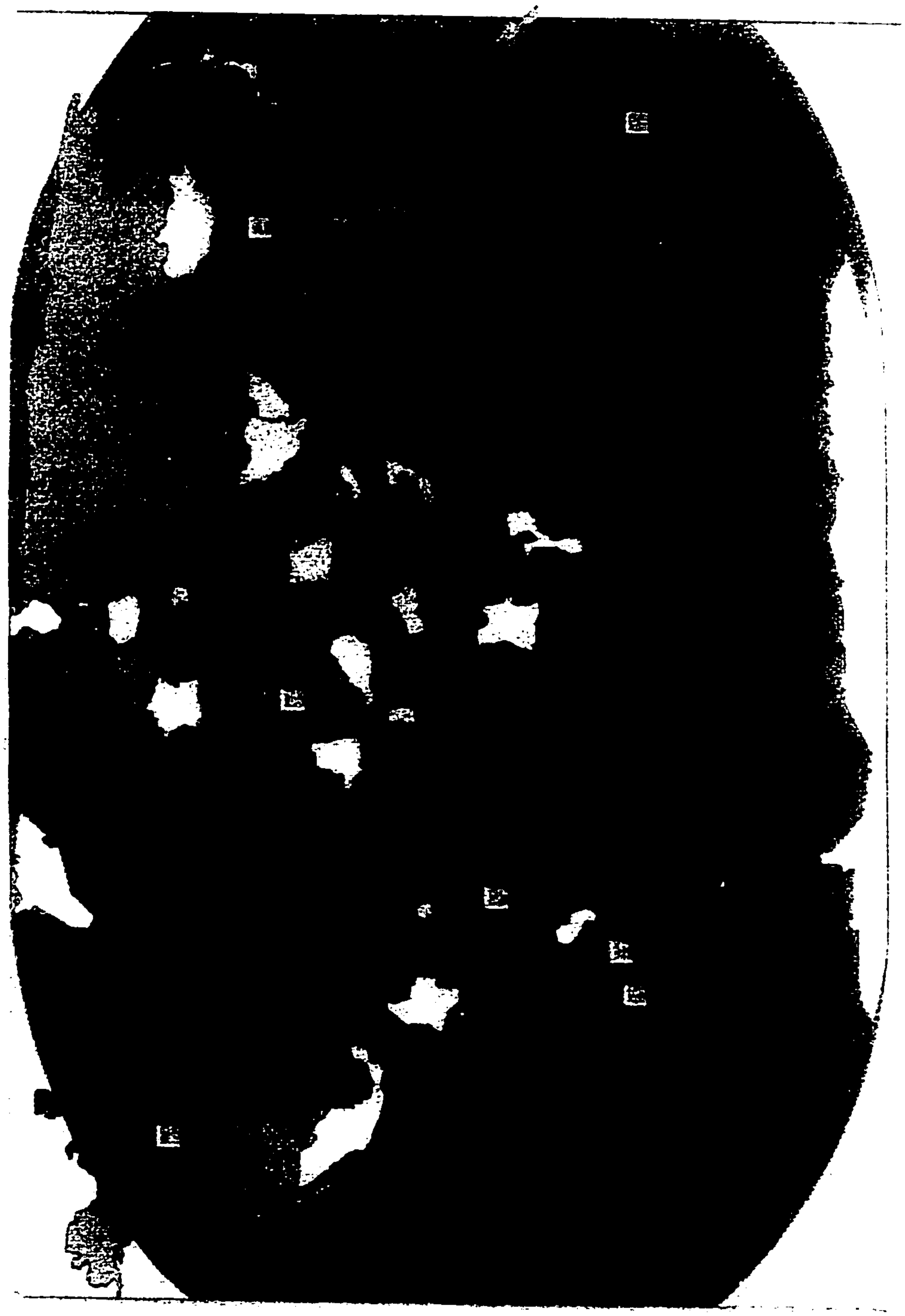
OCEANS, SEAS, & CITIES

Set 1h:
- Sydney
- Johannesburg
- Indian Ocean
- Calcutta
- Beijing
- Paris
- Rio de Janeiro

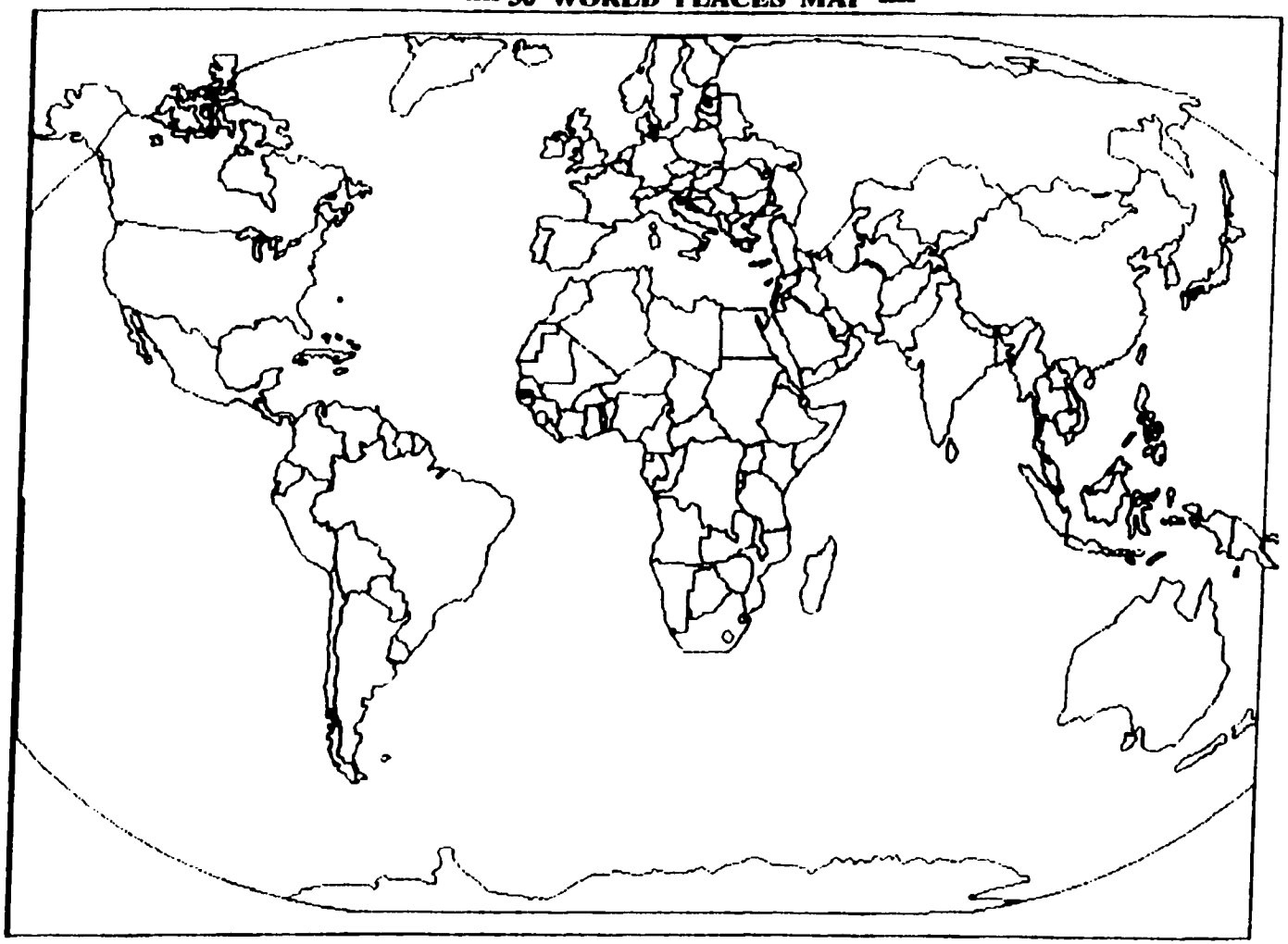
Set 2h:
- Buenos Aires
- Moscow
- Tokyo
- London
- Mediterranean Sea
- New York City
- Arctic Ocean

Set 3h:
- Cairo
- Atlantic Ocean
- Mexico City
- Caribbean Sea

WORLD MAP



--- 50 WORLD PLACES MAP ---



APPENDIX D

SCRIPT: COMPUTER-ASSISTED INSTRUCTION

RESEARCH STUDY TIMELINE – Computer-assisted Instruction

Week before study begins: Send Parental Consent Form home with students
Set due date for Parental Consent Forms
---Classroom teachers and Investigator meet
---Investigator provides training & materials
---Student treats provided by investigator as reward for returning consent forms

Day 1 of Research Study Treatment: Give PRETEST.
(Last day for accepting consent forms.)

Day 2 of Research Study Treatment: Give Instruction.

Day 3 of Research Study Treatment: Give Instruction.

Day 4 of Research Study Treatment: Give Instruction.

Field Day: No treatment provided

Grade Level Field Trip: No treatment provided

Day 5 of Research Study Treatment: Give Instruction.

Day 6 of Research Study Treatment: Give Instruction.

Day 7 of Research Study Treatment: Give Instruction.

Day 8 of Research Study Treatment: Give Instruction.

Day 9 of Research Study Treatment: Give Instruction.

Day 10 of Research Study Treatment: Give Instruction.*

Day 11 of Research Study Treatment: Give POSTTEST.*

Final full day of school

Final half day of school

----TEACHER SCRIPT----

Computer-assisted Instruction

REQUEST: Teachers, please provide no additional instruction on the following content over 50 States and 50 World Places during the days students are receiving treatments.

TREATMENT SECTIONS: (Drill sets in order of instruction)
GOAL: To complete as many drill sets as possible.

1. Part 1: Pre-Assessment

Part 2: Content—"50 World Places: 'Countries' and 'Oceans, Seas, & Cities'"

- "Countries" (Voice)

1. Drill in alphabetical order, using color map. Hearing electronic voice.
2. Drill in random order using color map. Hearing electronic voice.

- "Oceans, Seas, & Cities" (Voice)

1. Drill in alphabetical order, using color map. Hearing electronic voice.
2. Drill in random order using color map. Hearing electronic voice.

- "Countries" (Read/Color)

1. Drill in alphabetical order using color map. Read word on screen.
2. Drill in random order using color map. Read word on screen.

- "Oceans, Seas, & Cities" (Read/Color)

1. Drill in alphabetical order using color map. Read word on screen.
2. Drill in random order using color map. Read word on screen.

- "Countries" (Read/White)

1. Drill in alphabetical order using blackline (white) map. Read word on screen.
2. Drill in random order using blackline (white) map. Read word on screen.

- "Oceans, Seas, & Cities" (Read/White)

1. Drill in alphabetical order using blackline (white) map. Read word on screen.
2. Drill in random order using blackline (white) map. Read word on screen.

MATERIALS:

--Computer lab with a computer for each student
--Internet connection
--Video camera, tripod, and videotape
--Timer

--Pretest:

1. Part 1--50 States (map & list)
2. Part 2--50 World Places (map & list)

--Posttest:

1. Part 1--50 States (map & list)
2. Part 2--50 World Places (map & list)

PART 1

Part 1: PRETEST

1. Day 1 --- See Pretest Script
2. Students will be instructed to identify 50 World Places on an unlabeled, blackline World map by putting the corresponding number from the place list on the correct location.
3. Students have 15 minutes to complete the pretest.

TREATMENT:

A. Daily Procedures, Part 1

1. Teacher leads students to computer lab to receive computer-assisted instruction. Each student will work independently on a single computer.

2. SESSION #1: Teacher provides introductory information on operating "Click and Learn" software.

3. Start the video camera at the beginning of each 15-minute session.

4. Set the timer for 15 minutes.

B. Computer-assisted Instruction

INTRODUCTION SCRIPT

1. SESSION #1---Teacher Explanation of Computer Program Procedures

- Using a demonstration computer, lead students through the Internet log-on procedures to the district homepage.

Teacher begins with the following introduction:

- "Using the computer, you are going to learn how to identify and locate 50 World Places on a map.
- First you learn to identify and locate the 50 World Places in alphabetical order, then you will learn to identify and locate the places in random order.
- The software program you will use to do this is titled, *Click and Learn*. We are going to log onto the Internet version of the software now."

2. Instruct students to go on the computers then say:

- "Go up to the Bookmarks. Click on the bookmark that tells you to go to the home page of *Click and Learn*."

3. The *Click and Learn* program will load onto the screen. When the *Click and Learn* Homepage opens on the student screens say:

- "I am now going to teach you how to get into the correct section of the software where you will begin to learn about identifying and locating the 50 World Places. After this time you will be going into the program by yourself every time we are here in the computer lab.
- "You will need to open several folders to get to the correct screen to begin."

- Now, look on the upper right hand section of the homepage screen. Click the button that says 'Drills'."

4. After the "Drills" page opens say:
- "Now click on the link titled "Lawrence Studies."
- "The next page you see will have a small black screen in the middle of it. Under it is a yellow rectangle that says: 'Start Assignment'."
- "You should now see a *Click and Learn* page that has the list of lessons you will use during the study. Notice on the screen that there is a drill list. Three drills are about the 50 United States. You will not be using those drills."
- "Starting with 1:32 Countries (Voice), let's read the rest of the drill list together:
    1:32 Countries (Voice)
    2: Oceans, Seas, Cities (Voice)
    3:32 Countries (Read/Color)
    4: Oceans, Seas, Cities (Read/Color)
    5:32 Countries (Read/White)
    6: Oceans, Seas, Cities (Read/White)

5. After reading the list, explain to the students that they will begin the study using the drill labeled "Countries (Voice)," then they will learn "Oceans, Seas, Cities (Voice)." Tell the students that they will be expected to complete as many drills as they can every day until the last day of the study.

6. Tell students to click on the drill-- Countries (Voice). You will give them a little more explanation, then they will be on their own.

7. The next screen you see has a box with a computer mouse located in the middle of the screen. Tell the students to:
- "Click the 'mouse' to Start Drill."

8. The next screen will show the program loading. Then you see a screen with a box in it. The box identifies several elements that the students should check every time they see this type of screen. Tell the students to check the following:
- "Make sure the Practice box is checked when you are only practicing.
- The number of questions will always begin at 7, then will automatically move to add more items as you are successful during the drill.
- The Difficulty Level button should always be located in the middle at Medium.

9. Notice that at the top right hand side of the screen are two words. The Help button may be able to answer some of the questions that arise during the drill. The Exit button will return you to the Second Homepage with the subtitle Lawrence Study on it. So every time a student wants to change a drill, the procedure will be the same.

10. Say to students:

- "Now complete the drill games in order, beginning with Countries (Voice).
- Just follow the directions the computer gives you.
- First complete the drill game in alphabetical order, then complete the same drill game in random order.
- Go through the drill games in order as they are on the Drill List screen.
- When you complete the drill game in random order, try it one more time with the TEST box checked ✔ (check boxes before running the drill).
- Repeat this drill process as time allows.
- You will have 15 minutes each day to complete as many of the drill games as you can.
- If you do not complete a drill game in the 15 minutes, do not worry, you may begin at that spot tomorrow.
- You must remember where you stop the drill game, so you know where to begin the next day.

11. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera."

12. When instruction is completed for all 50 World Places ("Countries" and "Oceans, Seas, Cities"), in both alphabetical and random drills, proceed to give 50 World Places Posttest.

Part 3: POSTTEST

13. Day 11 --- See Posttest Script
14. Students will be instructed to identify 50 World Places on an unlabeled, blackline World map by putting the corresponding number from the place list on the correct location.
15. Students have 15 minutes to complete the pretest.

TROUBLE-SHOOTING GUIDELINES for software:

1. When in doubt, or any problem occurs, click on Drill Library to return to Lawrence Study screen.
2. Note: Sometimes when Drill Library is clicked, the Click and Learn Homepage will appear. This means you have to click on "Drills" then go to the Lawrence Study screen, etc.
3. Exit will take you back to the Click and Learn Homepage.
4. When running the drill, try to beat the clock. HINT: After running the drill several times, try to anticipate what the next place will be in alphabetical order. This hint does not help when working in random order.
5. After each successful drill set, click 'continue' to move to the next drill set.
6. If a student gets extremely frustrated because of no knowledge of places, click on Discussion button instead of Practice button. The places will be pointed out on the screen with no time limit or drill.
7. After completing "Countries (Voice)" alphabetically, then run the drill in random. Then after completing "Countries (Voice)" in random, go to Drill Library screen

and choose "Oceans, Seas, Cities (Voice)." Thereafter, continue completing as many drill sets from the Drill Library that time restraints allow.

How To Sign In
Intro to Click and Learn
Try our Free Geography Demo
Try our "Demo of The Week"
Free Blank Blackline Maps
Teacher Resources/Information
Catalog of Products
What Can I Learn in 90 Min.?
What Do We Offer You?
Technical Information

Geography, Anatomy, Vexillology, Math and More!

Teachers: Make Geography your Easiest Class.

Students: Learn all 50 states in about 90 minutes.

Parents: Help Your Child Learn Quickly

Tech Coordinators: No Installation Required.

Geography Bee Participants: Scholarships Available

Philanthropist: Donate this software to your school

Online Demo shows Geography Can Be Fun. Play it!

Weekly Demo changes each week. Try it Out

Read our testimonials **to see what others say.**

Contact Us. email us at info@clickandlearn.com **with any question or comment.**

Drill Library

A Quick Tutorial
Lawrence Study
Visitor Games

Free Games / Drills

Members:
Our Website operates as an Online School. When you register, you will have access to as many of the classrooms as you need (see our Catalog of Products to find the ones that you need).

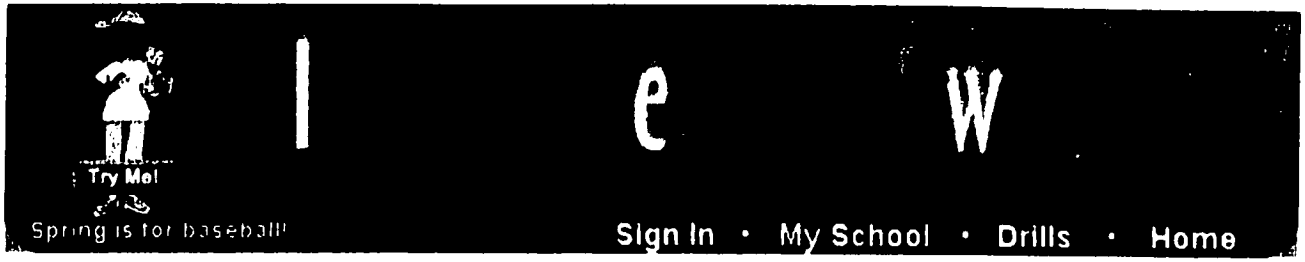
Visitors:
We let you try our FREE Demo Drills (South America) and FREE Demos of the Week to let you see how our system works.

Free Drills:
Simply click MySchool (above) to enter our Free Area.

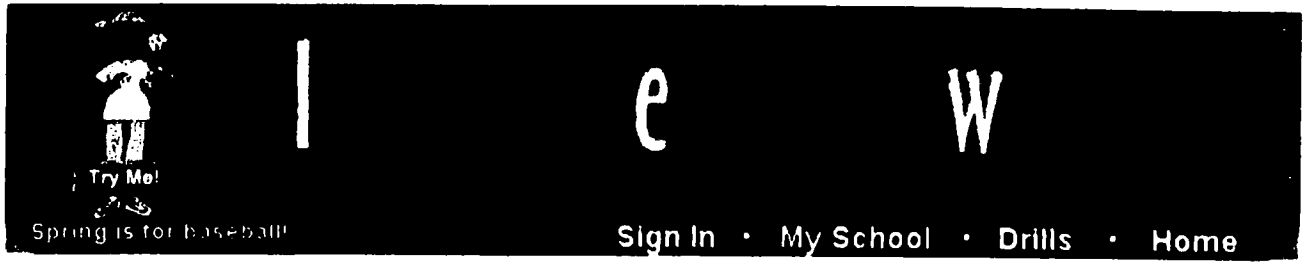
A Quick Tutorial

Visitor Games

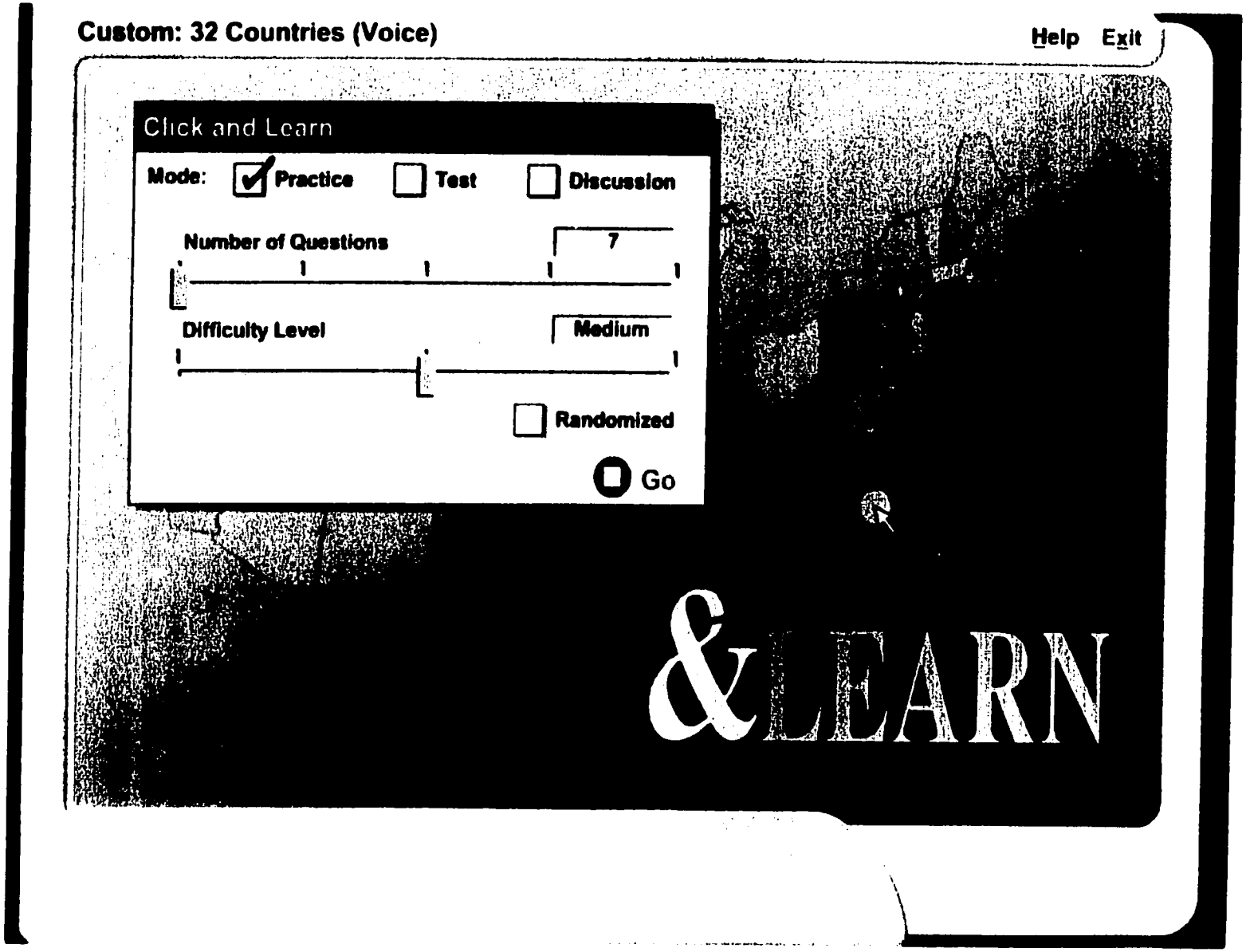
Lawrence Study

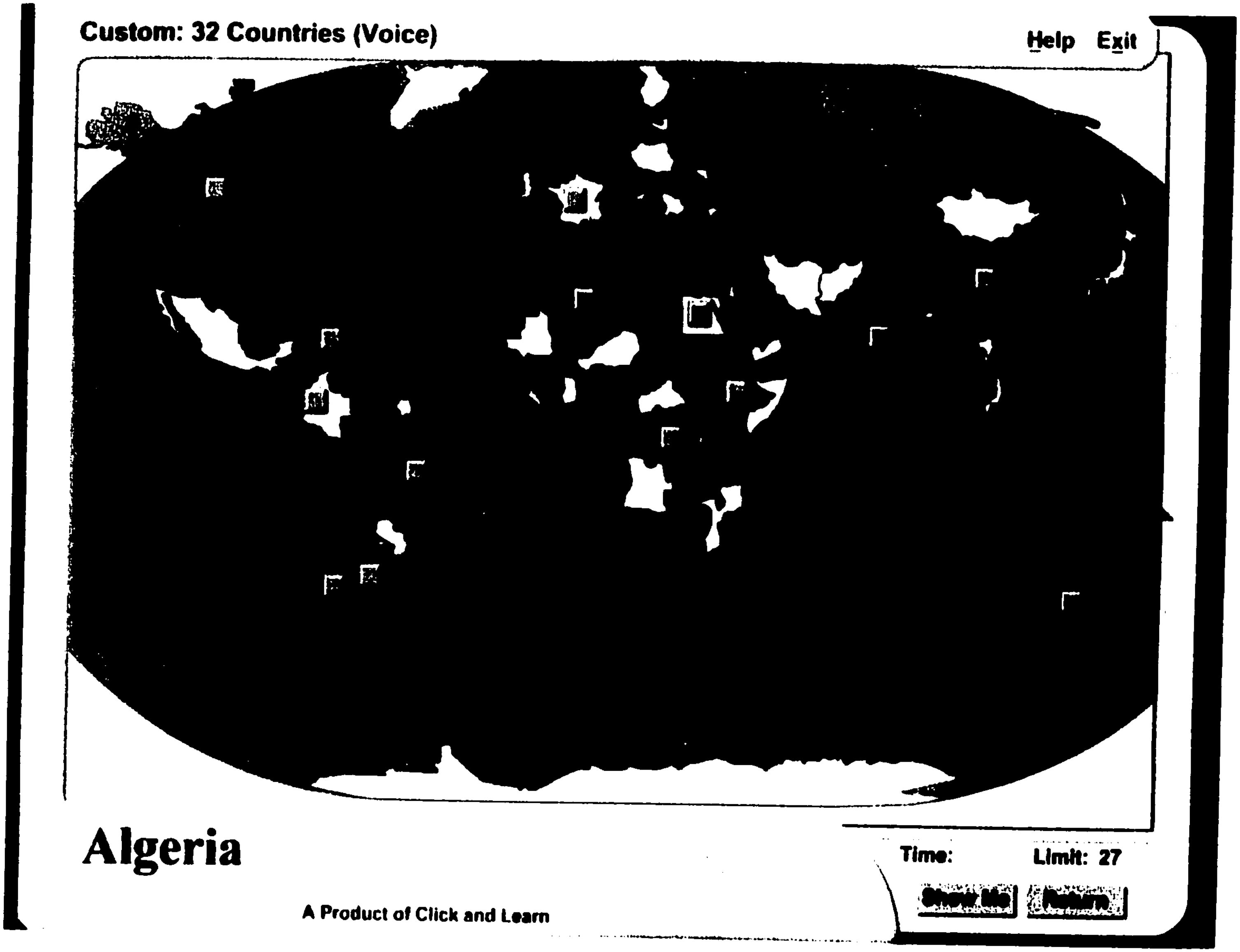


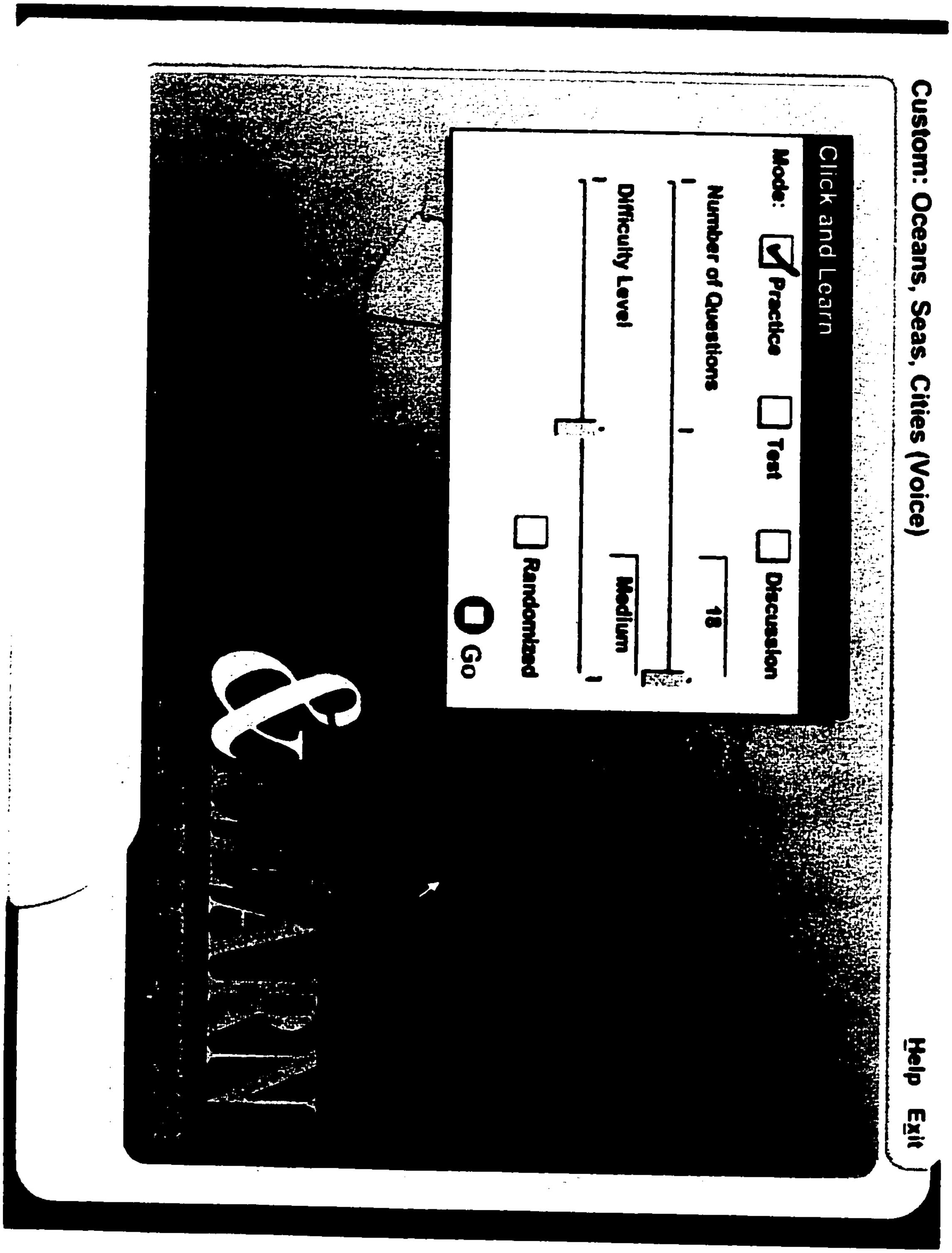
01: 50 States (Voice)
02: 50 States (Read/Color)
03: 50 States (Read/White)
1: 32 Countries (Voice)
2: Oceans, Seas, Cities (Voice)
3: 32 Countries (Read/Color)
4: Oceans, Seas, Cities (Read/Color)
5: 32 Countries (Read/White)
6: Oceans, Seas, Cities (Read/White)

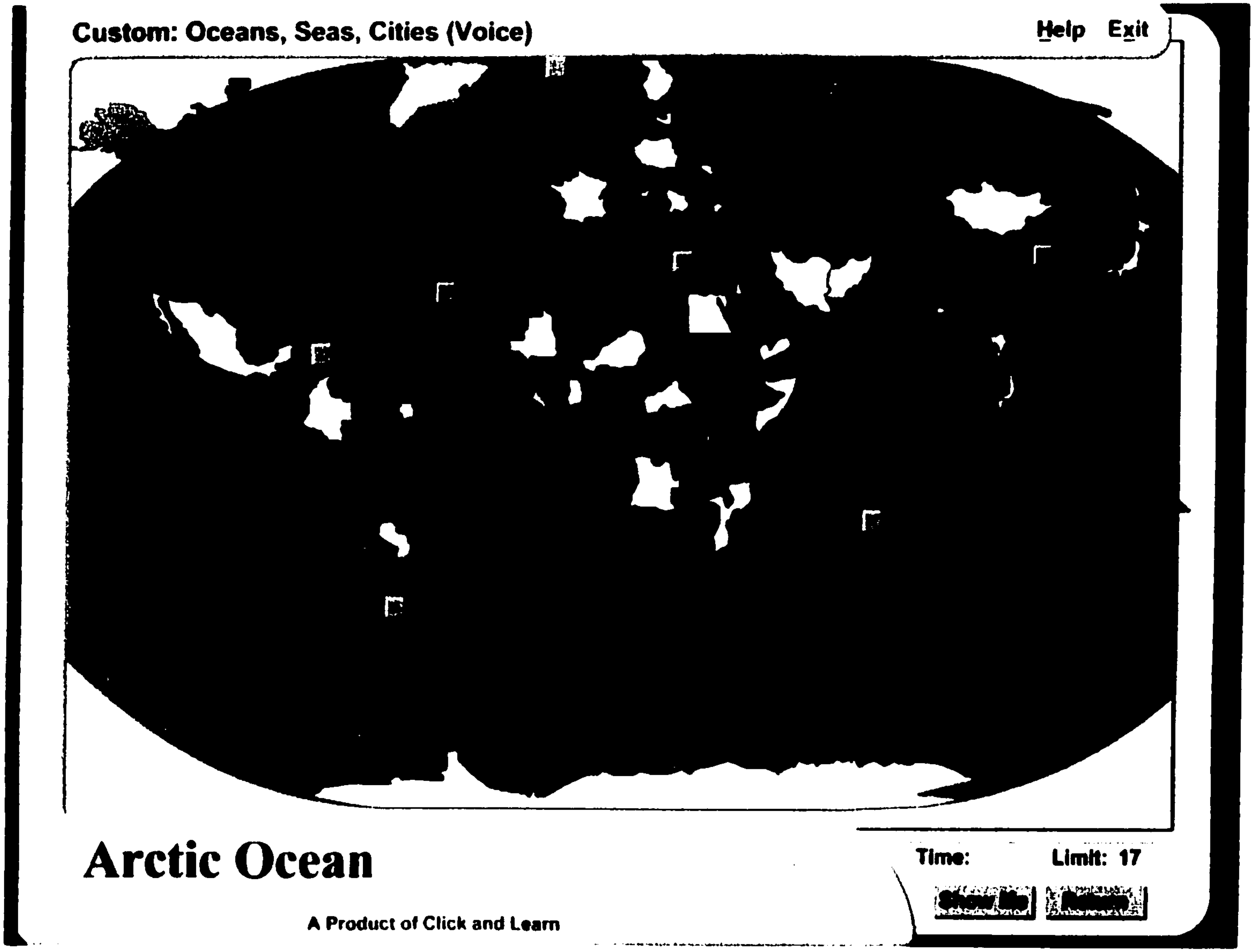


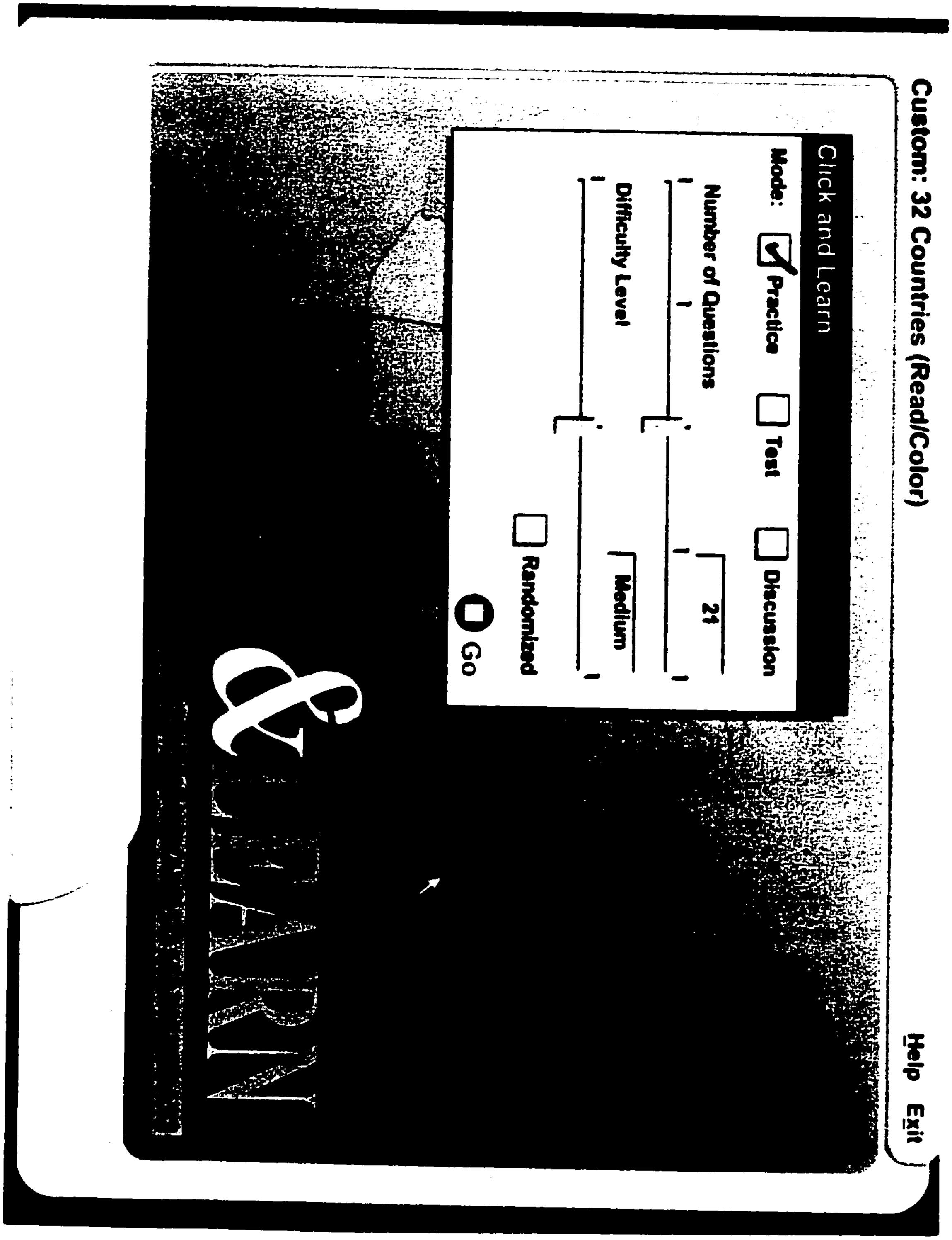
Drill Library | Geography | Customized | 1: 32 Countries (Voice)

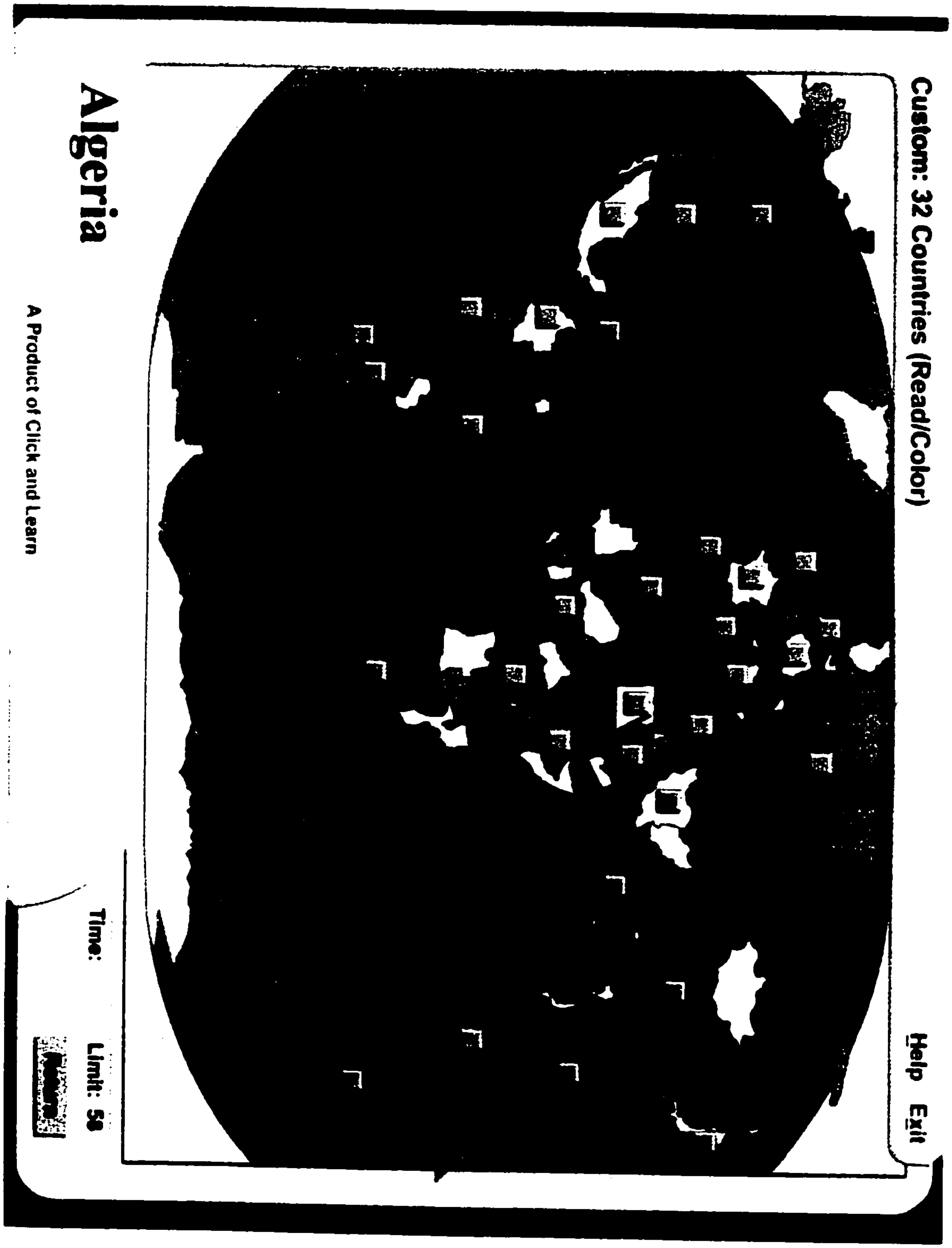

Custom: 32 Countries (Voice)
Help Exit
Click and Learn
Mode: Practice Test Discussion
Number of Questions
7
Difficulty Level
Medium
Randomized
Go
&LEARN

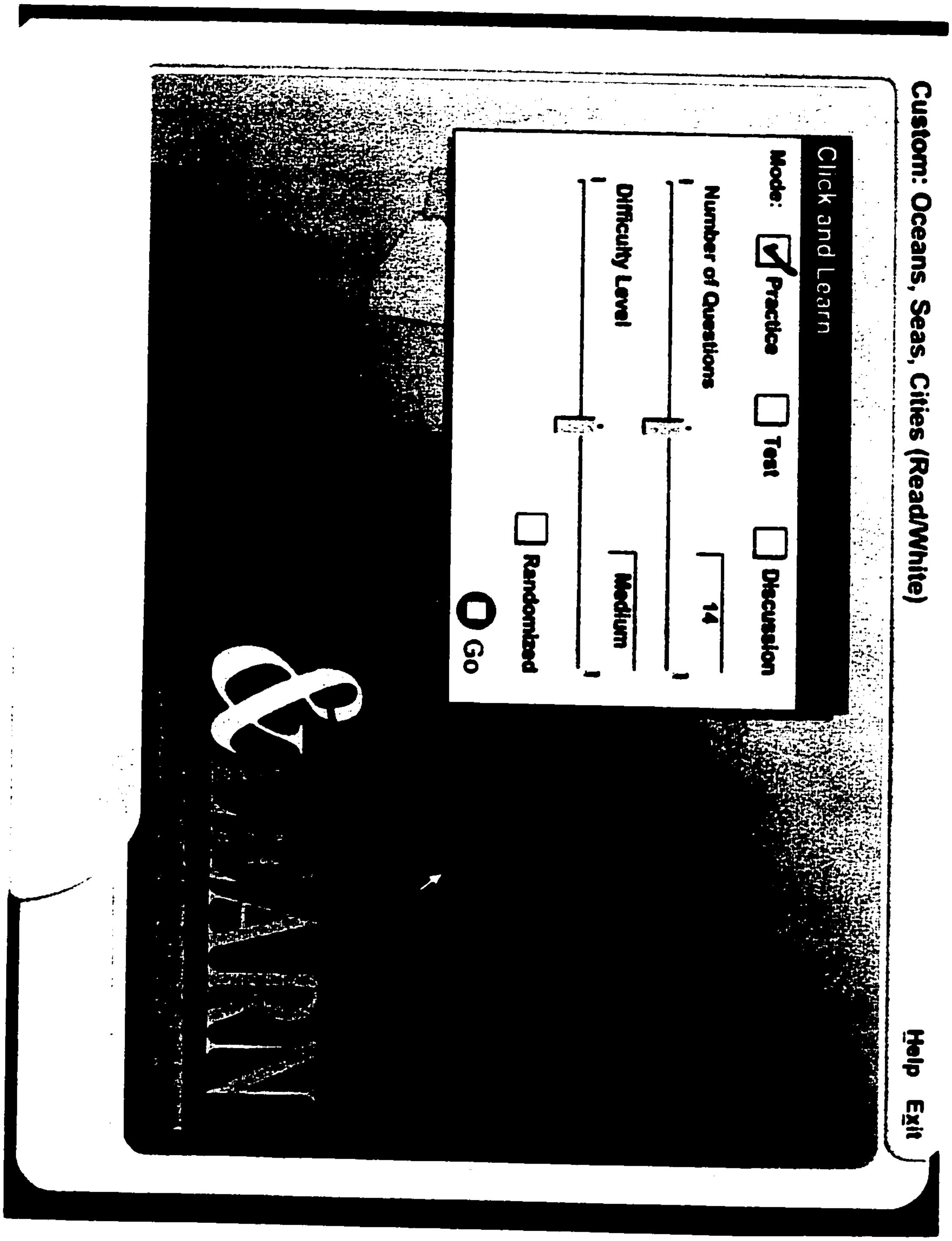

Custom: 32 Countries (Voice)
Help Exit
Algeria
Time:
Limit: 27
A Product of Click and Learn

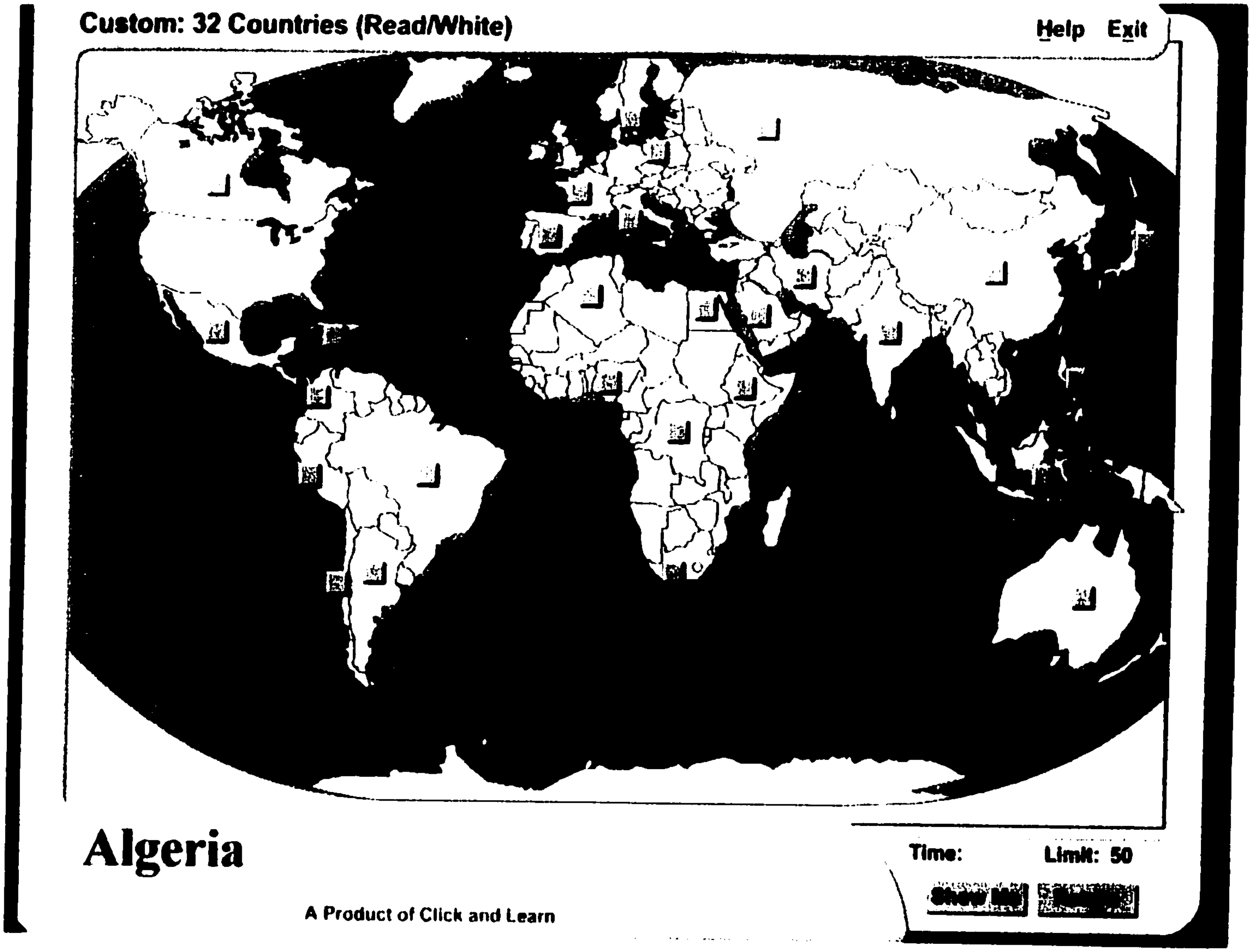

Custom: Oceans, Seas, Cities (Voice)
Help
Exit
Click and Learn
Mode:
Practice
Test
Discussion
Number of Questions
18
Difficulty Level
Medium
Randomized
Go

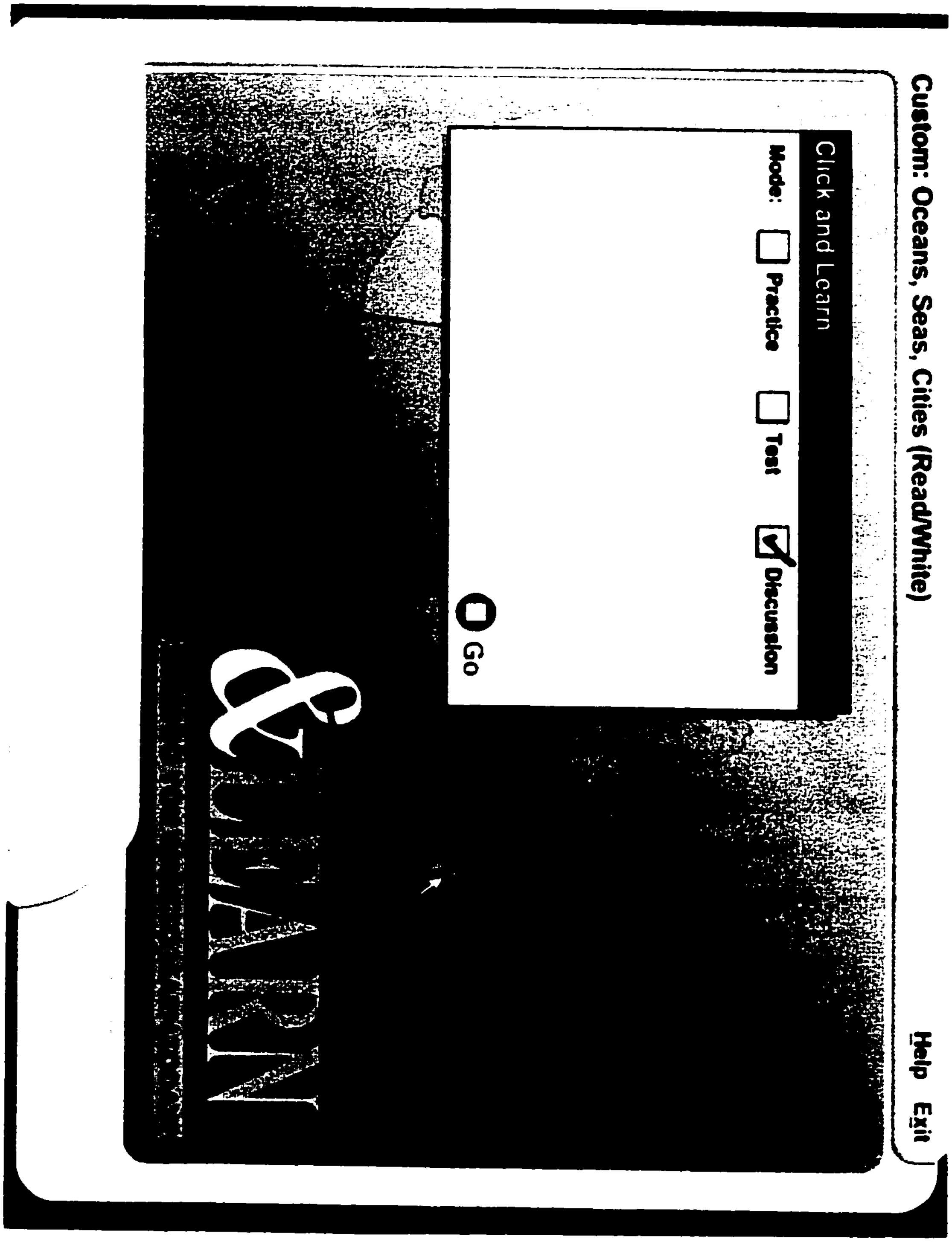

Custom: Oceans, Seas, Cities (Voice)
Help Exit
Arctic Ocean
A Product of Click and Learn
Time:
Limit: 17


Custom: 32 Countries (Read/Color)
Help
Exit
Click and Learn
Mode:
Practice
Test
Discussion
Number of Questions
21
Difficulty Level
Medium
Randomized
Go

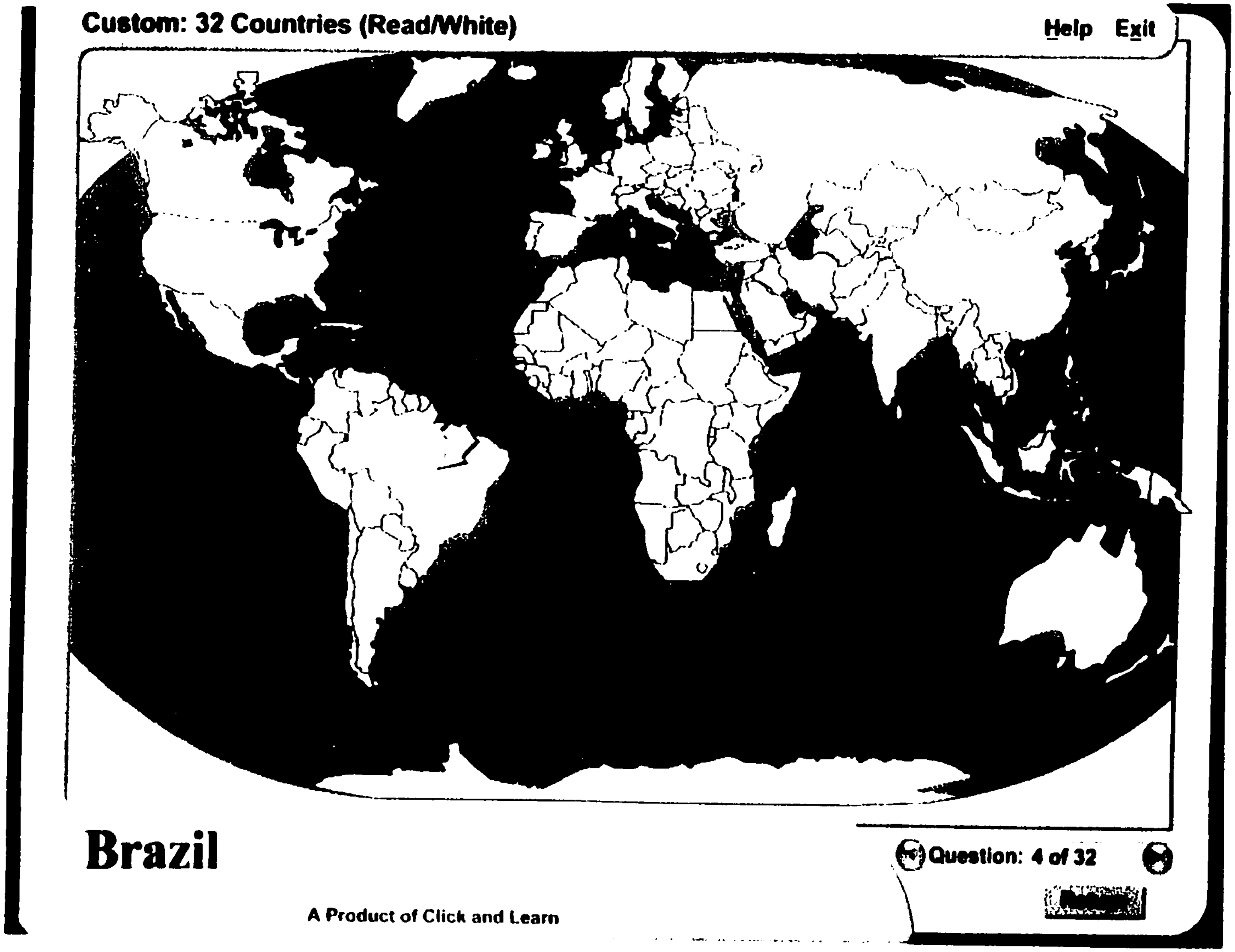

Custom: 32 Countries (Read/Color)
Help
Exit
Algeria
A Product of Click and Learn
Time:
Limit: 58


Custom: Oceans, Seas, Cities (Read/White)
Help
Exit
Click and Learn
Mode:
Practice
Test
Discussion
Number of Questions
14
Difficulty Level
Medium
Randomized
Go


Custom: 32 Countries (Read/White)
Help
Exit
Algeria
A Product of Click and Learn
Time:
Limit: 50


Custom: Oceans, Seas, Cities (Read/White)
Help
Exit
Click and Learn
Mode:
Practice
Test
Discussion
Go
&
LEARN


Custom: 32 Countries (Voice)
Help Exit
Mexico
Question: 19 of 32
A Product of Click and Learn


Custom: 32 Countries (Read/White)
Help Exit
Brazil
A Product of Click and Learn
Question: 4 of 32

APPENDIX E

SCRIPT: CONTROL GROUP

RESEARCH STUDY TIMELINE-----Control Group

Week before study begins: Send Parental Consent Form home with students
Set due date for Parental Consent Forms
---Classroom teachers and Investigator meet
---Investigator provides training & materials
---Student treats provided by investigator as reward for returning consent forms

Day 1 of Research Study Treatment: Give PRETEST.
(Last day for accepting consent forms.)

Day 2 of Research Study Treatment: Give NO Instruction.

Day 3 of Research Study Treatment: Give NO Instruction.

Day 4 of Research Study Treatment: Give NO Instruction.

Field Day: No treatment provided

Grade Level Field Trip: No treatment provided

Day 5 of Research Study Treatment: Give NO Instruction.

Day 6 of Research Study Treatment: Give NO Instruction.

Day 7 of Research Study Treatment: Give NO Instruction.

Day 8 of Research Study Treatment: Give NO Instruction.

Day 9 of Research Study Treatment: Give NO Instruction.

Day 10 of Research Study Treatment: Give NO Instruction.*

Day 11 of Research Study Treatment: Give POSTTEST.*

Final full day of school

Final half day of school

----TEACHER SCRIPT----

Control Group Instructions

REQUEST: Teachers, please provide no additional instruction on the following content over 50 World Places during the days students are receiving treatments.

TREATMENT SECTIONS: (In order of instruction)
GOAL: To gather data on student knowledge without content instruction.

Part 1: Pre-Assessment

Part 2: Content ---NONE at this time!

Part 3: Post-Assessment

MATERIALS:

--Pretest:
1. Part 1--50 World Places (map & list)

--Posttest:
1. Part 1--50 World Places (map & list)

SCRIPTS and PROCEDURES

Part 1: PRETEST
1. Day 1---See Pretest Script
2. Students will be instructed to identify 50 World Places on an unlabeled, blackline World map by putting the corresponding number from the place list on the correct location.
3. Students have 15 minutes to complete the pretest.

TREATMENT: NONE for 10 days

Part 3: POSTTEST
1. Day 11---See Posttest Script
2. Students will be instructed to identify 50 World Places on an unlabeled, blackline World map by putting the corresponding number from the place list on the correct location.
3. Students have 15 minutes to complete the pretest.

APPENDIX F

PILOT STUDY

----TEACHER SCRIPT----

Teacher-directed Instruction

REQUEST: Teachers, please provide no additional instruction on the following content over 50 States and 50 World Places during the days students are receiving treatments.

TREATMENT SECTION LISTS: (In order of instruction)

Part 1: Content

- Section 1: "50 States"— Color map

1. Drill in alphabetical order.
2. Drill in random order.

- Section 2: "50 States"—Blackline/White map

1. Drill in alphabetical order.
2. Drill in random order.

Part 2: Content

- Section 3: "World Place Names" ("Countries" & "Oceans, Seas, & Cities") – Color map

1a. "Countries"—Drill in alphabetical order.
1b. "Oceans, Seas, & Cities"—Drill in alphabetical order.
2a. "Countries"—Drill in random order.
2b. "Oceans, Seas, & Cities"—Drill in random order.

- Section 4: "World Place Names" ("Countries" & "Oceans, Seas, & Cities")– Blackline/White map

1a. "Countries"—Drill in alphabetical order.
1b. "Oceans, Seas, & Cities"—Drill in alphabetical order.
2a. "Countries"—Drill in random order.
2b. "Oceans, Seas, & Cities"—Drill in random order.

MATERIALS:

--Overhead projector, pen, and screen
--Video camera, tripod, and videotape
--Pointer
--Timer

--Pretests:

1. Part 1--50 States (map & list)
2. Part 2--50 World Places (map & list)

--Posttests:

1. Part 1--50 States (map & list)
2. Part 2--50 World Places (map & list)

--Transparenies:

1. Color United States map
2. Color World map
3. 50 States lists:
   --Alphabetical
   --Random List 1A (& 1B, 1C, 1D)
4. Blackline United States map
5. Blackline World map
6. 50 World Place Names lists:
   --Alphabetical
   --Random, List 2A (& 2B, 2C, 2D)

PART 1

PRETEST: 50 States

Part 1—Students will be instructed to identify and locate 50 States on a blackline USA map. Students have 15 minutes to complete the pretest.

TREATMENT:

A. Daily Procedures, Part 1-----Section 1 (1 & 2)

1. Have overhead projector, screen, and an overhead pen ready to use during treatment.

2. Teacher will be positioned in front of the group of students beside the overhead projector showing an unlabeled color/blackline map of the United States. Section 1: Transparency is a color United States map. During instruction, use the first word in /pairs/.

3. See 50 States lists for place names: Use Alphabetical list, or Random list (1A), in order of instruction as recommended in Treatment Section List. *Other random lists are available, if needed, to extend instruction (see 1B, 1C, 1D).

4. Start the video camera at the beginning of each 15-minute session.

5. Set the timer for 15 minutes.

6. TREATMENT PROCEDURE----Continue instruction as needed during time limit.
   [1.] Teacher points to the state name on the chart, and says the place name aloud.
   [2.] Teacher points to the state location on the color/blackline US map (on the overhead transparency), and says the state name aloud.
   [3.] Teacher asks the students to repeat the state name after her.
   [4.] Students provide a choral response for the state name.
   [5.] Teacher and students repeat treatment process as time allows (stop instruction at the end of 15 minutes).

B. Teacher-directed Instruction Script: (use first word in /pairs/)

1. DAY 1----Begin Day 1 Session with introduction:
   "I am going to teach you to identify, and locate on a map, the 50 United States in alphabetical/random order.
   I will repeat the procedure over and over until you have learned all 50 states.
   This is the procedure:
   First, I will point to the state name on the chart.
   Second, I will point to the state and its location on the map, and say its name.
   Then I will ask you to repeat that state's name."

2. Continue instruction using Daily Script steps.

3. DAILY SCRIPT: Use appropriate place name list for sequence of place names during instruction.
   --Each day continue instruction with the script provided below:
   Point to a state name on the chart, and say:
   "This state name is (example: Alabama)."
   Continue instruction during session, as time allows, by pointing to the corresponding state on the map, and saying:
   "This is the state of (example: Alabama)."
   "Now, (all students) repeat the place name after me: (choral response example: Alabama) ."
   Point to a state name on the chart, and say:
   "The next state name is (example: Alaska) .
   Continue instruction during session, as time allows, by pointing to the corresponding state on the map, and saying:
   "This is the state of (example: Alabama) ."
   Now, (all students) repeat the place name after me: (choral response example: Alaska) ."
   Continue instructional process until time is up.

4. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

5. DAY 2 ----Continue Daily Procedures, Part 1

6. Use Review Script to review place names learned in the previous session.
   ----REVIEW SCRIPT:
   Tell students:
   "We are going to quickly review the states you learned yesterday. I will point to the location of the state on the map and say its name. Then I want all of you to repeat the state's name after me.

7. Next, repeat Daily Script steps to teach the next place names on the alphabetical/random 50 States list, until all 50 states have been covered. If all 50 states are not covered during this session, continue instruction on the next day from where instruction ended when time ran out.

8. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

9. DAY 3----Repeat Daily Procedures, Part 1, Review Script, and Daily Script as needed until all 50 states have been covered.

10. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

11. DAY 4:
    -----If all 50 states have NOT been covered alphabetically, continue to repeat Daily Procedures, Part 1, Review Script, and Daily Script as needed until all 50 states have been covered in alphabetical order.
    -----If all 50 states HAVE been covered alphabetically, go to TREATMENT C. Daily Procedures, Part 2----Section 2.

TREATMENT:
C. Daily Procedures, Part 1----Section 2 (1 & 2)

1. Continue to repeat treatment process provided in Daily Procedures, Part 1---Section 1.

2. CHANGE transparency: Section 2 uses a blackline United States map. During instruction, use the second word in /pairs/.

3. CHANGE to 50 States Random List, 1A.

4. Repeat Daily Procedures, Part 1, Review Script, and Daily Script as needed until all 50 states have been covered in random order.

5. When instruction for all 50 states, alphabetical and random, have been completed, procedure to give 50 States Posttest.

POSTTEST: 50 States

Part 1—Students will be instructed to identify and locate 50 States on a blackline USA map. Students have 15 minutes to complete the posttest.

PART 2

PRETEST: 50 World Places

Part 2—Students will be instructed to identify and locate 50 World Places (Countries, Oceans, Seas, & Cities) on a blackline USA map. Students have 15 minutes to complete the pretest.

NOTE: "50 World Places" are defined in this study to include 2 sections: "Countries" and "Oceans, Seas, and Cities." Use the "Countries" list first, then complete the "Oceans, Seas, and Cities" list to complete instruction of 50 World Places throughout all treatment procedures.

TREATMENT:
A. Daily Procedures, Part 2----Section 3 (1a, 1b, 2a, 2b)

1. Have overhead projector, screen, and an overhead pen ready to use during treatment.

2. Teacher will be positioned in front of the group of students beside the overhead projector showing an unlabeled color/blackline map of the World. Section 3: Transparency is a color World map. During instruction, use the first word in /pairs/.

3. See 50 World Place Names lists for place names: Use Alphabetical list, or Random list (2A), in order of instruction as recommended in Treatment Section List. *Other random lists are available, if needed, to extend instruction (see 2B, 2C, 2D).

4. Section 3: Content sequence covered during instruction on color World map.
   --1a. "Countries"—Drill in alphabetical order.
   --1b. "Oceans, Seas, & Cities"—Drill in alphabetical order
   --2a. "Countries"—Drill in random order.
   --2b. "Oceans, Seas, & Cities"—Drill in random order.

5. Start the video camera at the beginning of each 15-minute session.

6. Set the timer for 15 minutes.

7. TREATMENT PROCEDURE--Continue instruction as needed in time limit.
   [1.] Teacher points to the world place name on the chart, and says the place name aloud.
   [2.] Teacher points to the location of the place on the color/blackline World map (on the overhead transparency), and says the place name aloud.
   [3.] Teacher asks the students to repeat the place name after her.
   [4.] Students provide a choral response for the world place name.
   [5.] Teacher and students repeat treatment process as time allows (stop instruction at the end of 15 minutes).

B. Teacher-directed Instruction Script: (use first word in /pairs/)

1. DAY 1----Begin Day 1 Session with introduction:
   "I am going to teach you to identify, and locate on a map, 50 World Places in alphabetical/random order.
   I will repeat the procedure over and over until you have learned all 50 World Places. This is the procedure:
   First, I will point to the world place name on the chart.
   Second, I will point to the place and its location on the world map, and say its name.
   Then I will ask you to repeat that place name."

8. Continue instruction using Daily Script steps.

9. DAILY SCRIPT: Use appropriate place name list for sequence of place names.
   --Each day continue instruction with the script provided below:
   Point to state name on the chart, and say:
   "This place name is _(example: Algeria)."
   Continue instruction during session, as time allows, by pointing to the corresponding place on the world map, and saying:
   "This is the location of _(example: Algeria)."
   "Now, (all students) repeat the place name after me: _(choral response example: Algeria) ."
   Point to state name on the chart, and say:
   "The next place name is _(example: Argentina) .
   Continue instruction during session, as time allows, by pointing to the corresponding place on the world map, and saying:
   "This is the location of _(example: Argentina)."
   Now, (all students) repeat the place name after me: _(choral response example: Argentina) ."
   Continue instructional process until time is up.

10. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

11. DAY 2 ----Continue Daily Procedures, Part 1

12. Use Review Script to review place names learned in the previous session.
    ---REVIEW SCRIPT:
    Tell students:
    "We are going to quickly review the world places you learned yesterday. I will point to the location of the place on the map and say its name. Then I want all of you to repeat the place name after me.

13. Next, repeat Daily Script steps to teach the next place names on the alphabetical/random 50 World Places list, until all 50 places have been covered. If all 50 places are not covered during this session, continue instruction on the next day from where instruction ended when time ran out.

14. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

15. DAY 3----Repeat Daily Procedures, Part 1, Review Script, and Daily Script as needed until all 50 places have been covered.

16. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

17. DAY 4:
    -----If all 50 world places have NOT been covered alphabetically, continue to repeat Daily Procedures, Part 1, Review Script, and Daily Script as needed until all 50 world places have been covered in alphabetical order.
    -----If all 50 world places HAVE been covered alphabetically, go to TREATMENT C. Daily Procedures, Part 2----Section 4.

TREATMENT:

C. Daily Procedures, Part 2-----Section 4 (1a, 1b, 2a, 2b)

1. Continue to repeat treatment process provided from Daily Procedures, Part 1----Section 2, for teaching 50 World Places in random order.

2. CHANGE transparency: Section 4 uses a blackline World map. During instruction, use the second word in /pairs/.

3. Section 4: Content sequence covered during instruction on blackline World map.
   --1a. "Countries"—Drill in alphabetical order.
   --1b. "Oceans, Seas, & Cities"—Drill in alphabetical order
   --2a. "Countries"—Drill in random order.
   --2b. "Oceans, Seas, & Cities"—Drill in random order.

3. CHANGE to 50 World Place Names Random List, 2A.

18. Repeat Daily Procedures, Part 1 steps, Review Script, and Daily Script as needed until all 50 world places have been covered in random order.

19. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera.

7. When instruction for all 50 world places, alphabetical and random, have been completed, give students 50 World Places Posttest.

POSTTEST: 50 World Places

Part 2—Students will be instructed to identify and locate 50 World Places (Countries, Oceans, Seas, & Cities) on a blackline USA map. Students will have 15 minutes to complete the posttest.

----TEACHER SCRIPT----

Computer-assisted Instruction

REQUEST: Teachers, please provide no additional instruction on the following content over 50 States and 50 World Places during the days students are receiving treatments.

TREATMENT SECTIONS: (Drill sets in order of instruction)
GOAL: To complete as many drill sets as possible during time constraints.

Part 1: Content—"50 States"

- "50 States" (Voice)

1. Drill in alphabetical order, using color map. Hearing electronic voice.
2. Drill in random order using color map. Hearing electronic voice.

- "50 States" (Read/Color)

1. Drill in alphabetical order using color map. Read word on screen.
2. Drill in random order using color map. Read word on screen.

- "50 States" (Read/White)

1. Drill in alphabetical order using blackline (white) map. Read word on screen.
2. Drill in random order using blackline (white) map. Read word on screen.

Part 2: Content—"50 World Places: 'Countries' and 'Oceans, Seas, & Cities'"

- "Countries" (Voice)

1. Drill in alphabetical order, using color map. Hearing electronic voice.
2. Drill in random order using color map. Hearing electronic voice.

- "Oceans, Seas, & Cities" (Voice)

1. Drill in alphabetical order, using color map. Hearing electronic voice.
2. Drill in random order using color map. Hearing electronic voice.

- "Countries" (Read/Color)

1. Drill in alphabetical order using color map. Read word on screen.
2. Drill in random order using color map. Read word on screen.

- "Oceans, Seas, & Cities" (Read/Color)

1. Drill in alphabetical order using color map. Read word on screen.
2. Drill in random order using color map. Read word on screen.

- "Countries" (Read/White)

1. Drill in alphabetical order using blackline (white) map. Read word on screen.
2. Drill in random order using blackline (white) map. Read word on screen.

- "Oceans, Seas, & Cities" (Read/White)

1. Drill in alphabetical order using blackline (white) map. Read word on screen.
2. Drill in random order using blackline (white) map. Read word on screen.

MATERIALS:

--Computer lab with a computer for each student
--Internet connection
--Video camera, tripod, and videotape
--Timer
--Pretests:
1. Part 1--50 States (map & list)
2. Part 2--50 World Places (map & list)
--Posttests:
1. Part 1--50 States (map & list)
2. Part 2--50 World Places (map & list)

PART 1

PRETEST: 50 States

Part 1—Students will be instructed to identify and locate 50 States on a blackline USA map. Students have 15 minutes to complete the pretest.

TREATMENT:

A. Daily Procedures, Part 1

1. Teacher leads students to computer lab to receive computer-assisted instruction. Each student will work independently on a single computer.

2. SESSION #1: Teacher provides introductory information on operating "Click and Learn" software.

3. Start the video camera at the beginning of each 15-minute session.

4. Set the timer for 15 minutes.

B. Computer-assisted Instruction Script: Introduction 1

1. DAY 1: Teacher Explanation of Computer Program Procedures

Using the instructional computer, lead students through the log-on procedures.

Teacher script:

"Using the computer, you are going to learn how to identify and locate the 50 United States in on a map.
First you learn to identify and locate the 50 States in alphabetical order, then you will learn to identify and locate the 50 States in random order.
The software program you will use to do this is titled, *Click and Learn*. We are going to log onto the Internet version of the software now."

2. Instruct students to turn on the computers, then go to the district Internet server, then say:
"Go up to Bookmarks. Click on the bookmark to go to the home page of *Click and Learn*."

3. The *Click and Learn* program will load onto the screen. When the *Click and Learn* Homepage opens on the student screens say:
"I am now going to teach you how to get into the part of the software you will use to learn about identifying and locating the 50 States.
You will need to open several folders to get to the correct screen to begin.
Now, look on the upper part of the screen. Click the button that says "Drills.""

4. After the "Drills" page opens say:
"Now click on the link titled "Lawrence Studies." This will take you to the page that has the special folders that you will use during the study."

5. On the left side of the screen, students will see a box with a choice of folders: "USA Geography" and "World Geography". Say:
"Click on the link, "USA Geography." This link will take you to the page of drill games."

6. The next screen will show a list of drill games for "USA Geography".

7. Say to students:
"Now complete the drill games in order.
Just follow the directions the computer gives you.
Go through the drill games in order as they are on the screen.
First complete the drill game in alphabetical order, then complete the same drill game in random order.
When you complete the drill game in random order, try it one more time with both the RANDOM and RUN AS TEST boxes checked ✔ (check boxes before running the drill).
You will repeat this process as time allows.
You will have 15 minutes each day to complete as many of the drill games as you can.
If you do not complete a drill game in the 15 minutes, do not worry, you may begin at that spot tomorrow.
You must remember where you stop the drill game, so you know where to begin the next day.

8. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera."

9. To Teacher: Below is a sample drill game set you may refer to as you clarify directions.

Day 1—Drill Set example: "50 States" (Voice)

STEPS:
[1.] Complete the "50 States" (Voice) drill in alphabetical order.
[2.] Next complete the "50 States" (Voice) drill in random order.
[3.] The next step is to complete the "50 States" (Voice) drill in RANDOM and RUN AS TEST. Make sure both boxes are checked ✔ before running the drill.

10. Give 50 States Posttest to students after last 15-minute session.

POSTTEST:
Part 1—Students will be instructed to identify and locate 50 States on a blackline USA map. Students have 15 minutes to complete the posttest.

PART 2

PRETEST:

Part 2—Students will be instructed to identify and locate 50 World Places (Countries, Oceans, Seas, & Cities) on a blackline world map. Students have 15 minutes to complete the pretest.

TREATMENT:

A. Daily Procedures, Part 2

1. Teacher leads students to computer lab to receive computer-assisted instruction. Each student will work independently on a single computer.

2. Teacher provides review for introductory information on operating "Click and Learn" software to get to content for "50 World Places: Countries and Oceans, Seas, & Cities".

3. Start the video camera at the beginning of each 15-minute session.

4. Set the timer for 15 minutes.

B. Computer-assisted Instruction Script: Introduction 2

1. DAY 1: Teacher Explanation of Computer Program Procedures

Using the instructional computer, lead students through the log-on procedures.

Teacher script:

"This time you are going to learn how to identify and locate 50 World Places in order using the computer.

Again, you will use the Internet version of the *Click and Learn* software. We are going to log on now."

2. Instruct students to turn on the computers, then go to the district Internet server, then say:

"Go up to Bookmarks. Click on the bookmark to go to the home page of *Click and Learn*."

8. The *Click and Learn* program will load onto the screen. When the *Click and Learn* Homepage opens on the student screens say:

"I am now going to teach you how to get into the part of the software you will use to learn about identifying and locating the 50 World Places.

Again, you will need to open several folders to get to the correct screen to begin.

Now, look on the upper part of the screen. Click the button that says "Drills.""

9. After the "Drills" page opens say:

"Now click on the link titled "Lawrence Studies."

10. On the left side of the screen, students will see a box with a choice of folders: "USA Geography" and "World Geography". Say:
"This time click on the link, "World Geography." This link will take you to the page of drill games you will use next."

11. The next screen will show a list of drill games for "World Geography".

12. Say the following to students:
"Now complete the drill games in order.
Just follow the directions the computer gives you.
Go through the drill games in order as they are on the screen.
First complete the drill game in alphabetical order, then complete the same drill game in random order. When you complete the drill game in random order, try it one more time with both the RANDOM and RUN AS TEST boxes checked ✔ (check boxes before running the drill).
You will repeat this process as time allows.
You will have 15 minutes each day to complete as many of the drill games as you can.
If you do not complete a drill game in the 15 minutes, do not worry, you may begin at that spot tomorrow.
You must remember where you stop the drill game, so you know where to begin the next day.

8. When 15 minutes are up, immediately stop the instruction process. Turn off the overhead projector and video camera."

9. On the last day of treatment give students the 50 World Places Posttest.

POSTTEST:

Part 2—Students will be instructed to identify and locate 50 World Places (Countries, Oceans, Seas, & Cities) on a blackline USA map. Students have 15 minutes to complete the posttest.

--------- TEACHER SURVEY ---------
Pilot Study

Directions:

Please answer the following questions to the best of your knowledge.
Your opinion is greatly appreciated.

1. Please provide some general information about your 4th grade classes.

   How many students are in class A receiving teacher-directed instruction? _____
   How many students from class A received parental consent to participate? _____

   How many students are in class B receiving computer-assisted instruction? _____
   How many students from class B received parental consent to participate? _____

2. Were the teacher-directed instructions on the script written clearly? YES NO

3. What would you like to see changed with the teacher-directed instructions?
   Comment below.

4. Were the charts a useful part of the instructions? YES NO

5. What is your opinion of the maps used in the pretests, posttests, and transparencies?

   50 States map:

   50 World Places map:

6. Was the 15-minute time limit too short? YES NO
   Was the 15-minute time limit too long? YES NO

7. Were the computer-assisted instructions for the teacher written clearly? YES NO

8. What would you like to see changed in the computer-directed instructions?
   Comment below.

9. Was the software, Click and Learn, easy to get to on the Internet? YES NO

10. Was Click and Learn easy to use? YES NO

11. What would you like to see changed with the software program? Comment below.

12. Were students easily able to complete the pretests and posttests? YES NO

13. What would you like to see changed with the pretests and posttests? Comment below.

14. Was increased student content knowledge demonstrated after the Pilot Study?
YES NO

15. Do you plan to use the teacher-directed instruction method in your regular classroom instruction? YES NO

16. Do you plan to use the computer-assisted instruction method in your regular classroom instruction? YES NO

17. Would you recommend Click and Learn software for teaching place names?
YES NO

18. Did the investigator give you enough support during the Pilot Study? YES NO

19. Did the investigator give you enough materials during the Pilot Study? YES NO

20. Provide additional comments on any area of the Pilot Study below.

TEACHERS

Teacher Training:

1. KSU on-line training at website:
   --Complete IRB Training Modules:
   (1.) History of Research Abuse of Human Subjects;
   (2.) Introduction to Human Subjects Research and The Multiple Project Assurance;
   (3.) KSU Multiple Project Assurance (MPA);
   (4.) The Belmont Report;
   (5.) Identifying, Assessing, and Minimizing Risks of Social and Behavioral Research; &
   (6.) Ethics of Research with Human Subjects.
2. Investigator explanation of study, duties, CD, and script procedures
3. Unaffiliated Investigator Agreement with signature

Teacher Expectations:

1. Time: 15 minutes a day for treatment.
   [Pilot Study = 5-6 days; Research Study = 15-20 days]
2. Send home Parent Consent Forms.
3. Collect Parent Consent Forms, then give to Investigator.
4. Give all Pretests and Posttests to students, then give to Investigator.
5. Provide 15 minutes of instruction daily
6. Provide instructional treatments as stated in scripts.
7. Videotape ALL treatments daily.

Teacher Materials:

1. Parent Consent Forms
2. Student class lists
3. 50 States Pretests
4. 50 States map overhead transparencies
5. 50 States Posttests
6. 50 World Places Pretests
7. 50 World Places map overhead transparencies
8. 50 World Places Posttests
9. "Click and Learn" CD
10. Video camera, tripod, and videotapes

Teacher Debriefing:

1. After completion of 50 World Places Posttest, return video camera, tripod, videotapes, and all materials (leftover and completed).
2. Complete and return Professional Survey.
3. Compensation discussion: "Click and Learn" online access for school/grade level.

----TEACHER SCRIPT----
[Pilot Study]

"50 World Places" -- PRETEST

Directions

1. Give each student one page of Pretest--"50 World Places" Place Name List and one Pretest--"50 World Places" Map.

2. Advise students to read the directions silently as you read them aloud:
   "Place the number of the World Place from the alphabetical list onto the correct map location. If there is no room for the number, draw a line from the location and put the number on the line."
   "You have 15 minutes to complete as much of the test as you can.
   I will set the timer NOW."

3. Tell students to turn in the map and 50 world place name list at the end of 15 minutes.

"50 World Places" -- POSTTEST

Directions

1. Give each student one page of Posttest--"50 World Places" Place Name List and one Posttest--"50 World Places" Map.

2. Advise students to read the directions silently as you read them aloud:
   "Place the number of the World Place from the alphabetical list onto the correct map location. If there is no room for the number, draw a line from the location and put the number on the line."
   "You have 15 minutes to complete as much of the test as you can.
   I will set the timer NOW."

3. Tell students to turn in the map and 50 world place name list at the end of 15 minutes.

PRETEST
[Pilot Study]

"50 STATES PLACE NAMES"

Student number _____ Gender F / M Age _____ Date _____

DIRECTIONS:

Place the State number from the alphabetical list onto the correct map location. If there is no room for the number, draw a line from the location and put the number on the line.

1. Alabama
2. Alaska
3. Arizona
4. Arkansas
5. California
6. Colorado
7. Connecticut
8. Delaware
9. Florida
10. Georgia
11. Hawaii
12. Idaho
13. Illinois
14. Indiana
15. Iowa
16. Kansas
17. Kentucky
18. Louisiana
19. Maine
20. Maryland
21. Massachusetts
22. Michigan
23. Minnesota
24. Mississippi
25. Missouri
26. Montana
27. Nebraska
28. Nevada
29. New Hampshire
30. New Jersey
31. New Mexico
32. New York
33. North Carolina
34. North Dakota
35. Ohio
36. Oklahoma
37. Oregon
38. Pennsylvania
39. Rhode Island
40. South Carolina
41. South Dakota
42. Tennessee
43. Texas
44. Utah
45. Vermont
46. Virginia
47. Washington
48. West Virginia
49. Wisconsin
50. Wyoming

Answer the following questions:

- How do you feel about using a computer? (check one)

___ I love computers.☺ ___ I think computers are okay.😐 ___ I do not like computers.☹

- How much time do you use a computer each day?

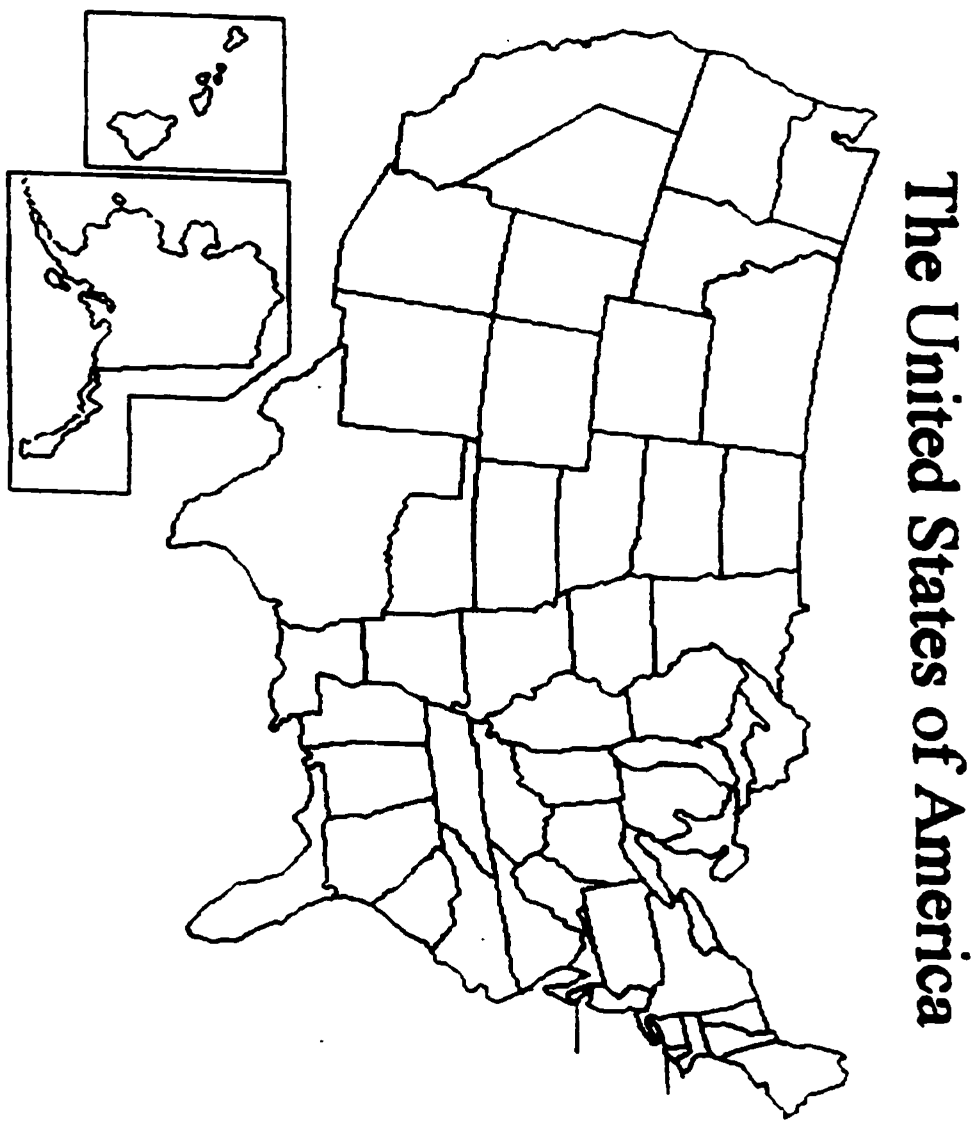
Monday ___ Tuesday ___ Wednesday ___ Thursday ___ Friday ___ Saturday ___ Sunday ___

- How do you feel about learning geography? (check one)

___ Geography makes me excited.☺ ___ Geography is okay.😐 ___ Geography is not good.☹

50 States Posttest

Student number __________ Date ___________ Score ___________



POSTTEST
[Pilot Study]

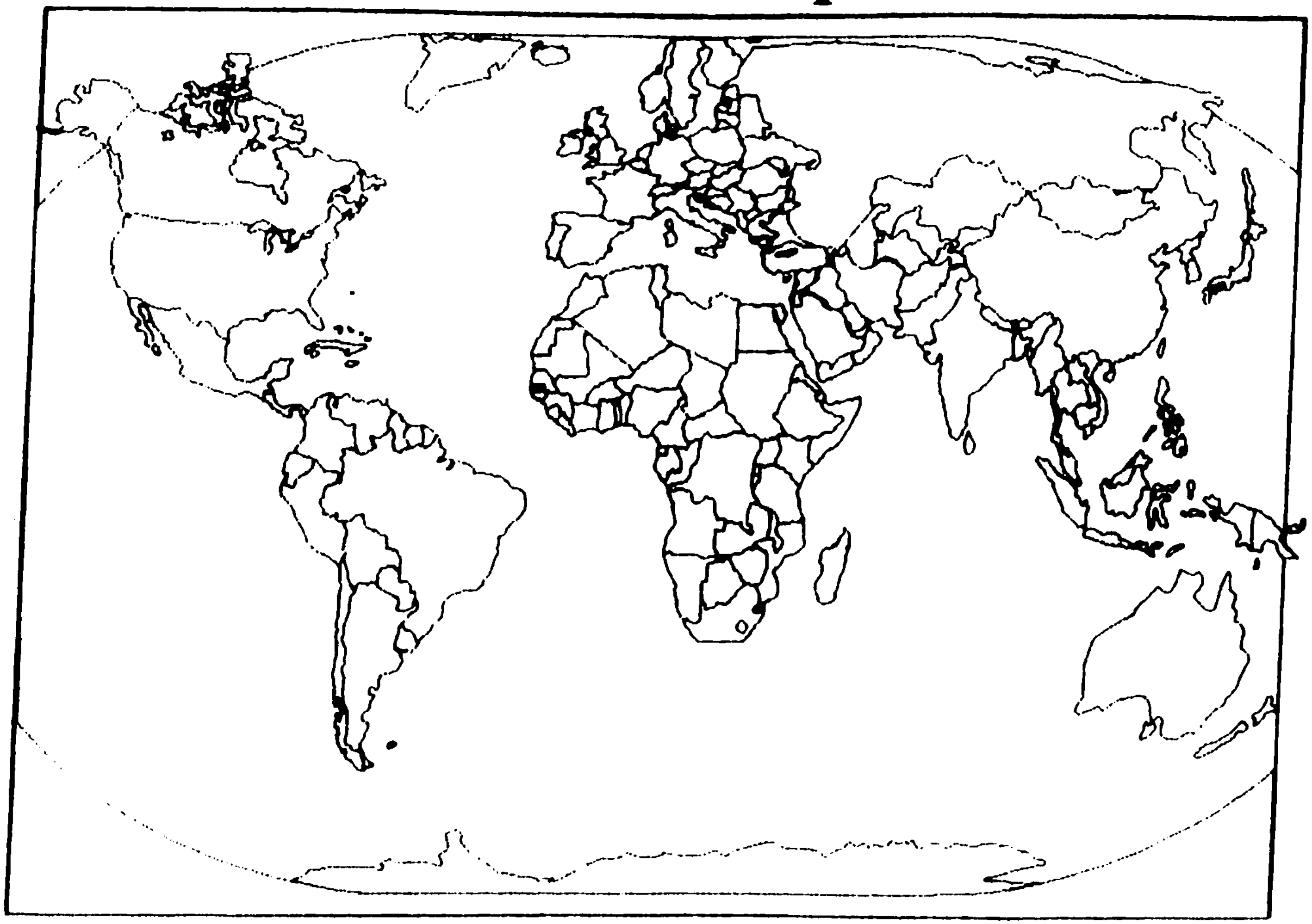
"50 WORLD PLACE NAMES"

Student number _____ Gender F / M Age _____ Date _____

DIRECTIONS:
Place the number of the World Place from the alphabetical list onto the correct map location.

1. Algeria
2. Arctic Ocean
3. Argentina
4. Atlantic Ocean
5. Australia
6. Beijing (Peking)
7. Brazil
8. Buenos Aires
9. Cairo
10. Calcutta
11. Canada
12. Caribbean Sea
13. Chile
14. China
15. Colombia
16. Cuba
17. Democratic Republic of Congo (Zaire)
18. Egypt
19. Ethiopia
20. France
21. India
22. Indian Ocean
23. Indonesia
24. Iran
25. Italy
26. Japan
27. Johannesburg
28. London
29. Mediterranean Sea
30. Mexico
31. Mexico City
32. Moscow
33. New York City
34. Nigeria
35. Paris
36. Peru
37. Philippines
38. Poland
39. Rio de Janeiro
40. Russia (USSR)
41. Saudi Arabia
42. South Africa
43. Spain
44. Sweden
45. Sydney
46. Tokyo
47. Turkey
48. United Kingdom (England)
49. United States
50. Yugoslavia

World Map



"50 WORLD PLACE NAMES"
PRETEST

Student number ________ Date ________ Score ________

A Product of Click and Learn Software
www.clickandlearn.com, 2002

50 WORLD PLACE NAMES——Alphabetical List
——Teacher——

COUNTRIES

Set 1a:
- Algeria
- Argentina
- Australia
- Brazil
- Canada
- Chile
- China

Set 2a:
- Colombia
- Cuba
- Democratic Republic of Congo
- Egypt
- Ethiopia
- France
- India

Set 3a:
- Indonesia
- Iran
- Italy
- Japan
- Mexico
- Nigeria
- Peru

Set 4a:
- Philippines
- Poland
- Russia
- Saudi Arabia
- South Africa
- Spain
- Sweden

Set 5a:
- Turkey
- United Kingdom
- United States
- Yugoslavia

OCEANS, SEAS, & CITIES

Set 1b:
- Arctic Ocean
- Atlantic Ocean
- Beijing
- Buenos Aires
- Cairo
- Calcutta
- Caribbean Sea

Set 2b:
- Indian Ocean
- Johannesburg
- London
- Mediterranean Sea
- Mexico City
- Moscow
- New York City

Set 3b:
- Paris
- Rio de Janeiro
- Sydney
- Tokyo

50 WORLD PLACE NAMES——Random List, #2A
——Teacher——

COUNTRIES

Set 1a:
- Japan
- Yugoslavia
- Philippines
- United States
- Brazil
- Mexico
- Peru

Set 2a:
- South Africa
- Sweden
- Australia
- Canada
- Cuba
- Congo
- Ethiopia

Set 3a:
- Turkey
- Iran
- Saudi Arabia
- Algeria
- India
- Russia
- Nigeria

Set 4a:
- Colombia
- Italy
- Poland
- Chile
- Argentina
- Spain
- China

Set 5a:
- United Kingdom
- France
- Egypt
- Indonesia

OCEANS, SEAS, & CITIES

Set 1b:
- Atlantic Ocean
- Indian Ocean
- Rio de Janeiro
- Paris
- Sydney
- Arctic Ocean
- Tokyo

Set 2b:
- Cairo
- Caribbean Sea
- Beijing
- London
- Buenos Aires
- Mexico City
- New York City

Set 3b:
- Moscow
- Mediterranean Sea
- Johannesburg
- Calcutta

50 WORLD PLACE NAMES-----Random List, #2B
----Teacher-----

COUNTRIES

Set 1c:
- Yugoslavia
- France
- United States
- Democratic Republic of the Congo
- United Kingdom
- Japan
- Poland

Set 2c:
- Algeria
- Russia
- Sweden
- Philippines
- Turkey
- Ethiopia
- Peru

Set 3c:
- Spain
- Egypt
- India
- Argentina
- Brazil
- Saudi Arabia
- Colombia

Set 4c:
- Italy
- Indonesia
- China
- Nigeria
- Mexico
- Australia
- Chile

Set 5c:
- Cuba
- South Africa
- Iran
- Canada

OCEANS, SEAS, & CITIES

Set 1d:
- Indian Ocean
- Mexico City
- Calcutta
- Beijing
- Caribbean Sea
- Paris
- Johannesburg

Set 2d:
- Moscow
- London
- Tokyo
- New York City
- Mediterranean Sea
- Buenos Aires
- Rio de Janeiro

Set 3d:
- Cairo
- Atlantic Ocean
- Arctic Ocean
- Sydney

APPENDIX G

SURVEYS

STUDENT DEBRIEFING QUESTIONS

1. Why do you think it is important to learn the location of these 50 world places?

2. Before taking the pretest did you ever notice the world places?

3. Since taking the pretest, have you noticed the world places mentioned on the radio, television, or read about them in a newspaper or magazine?

4. Did you try to study the world places at home (on-line or with another source, like an atlas or your parents)?

5. What did you think about the instruction (teacher-directed or computer-assisted; or lack of instruction)?

6. Do you have any additional comments?

Debriefing statement:

Thank you for participating in my study. I wanted to personally come to school and thank you for your help. I appreciate your hard work.

---------- TEACHER SURVEY ----------
Control Group: Study

Directions:

Please answer the following questions to the best of your knowledge.
Your opinion is greatly appreciated.

1. Please provide some general information about your 4th grade class.

   - How many students are in your classroom? _____
   - How many students received teacher-directed instruction? _____

   - How many special needs students are in your classroom? _____
   - Please use the list provided to identify the 'type' of special needs you serve in your classroom, then provide the number of students with this need.

   1. Gifted #_____
   2. Autistic # _____
   3. LD #_____
   4. BD #_____
   5. Hearing impaired #_____
   6. Sight impaired #_____
   7. Other:

   - Please use the list provided to identify the number of males and female students.
     Male #_____ Female #_____

2. What is your opinion of the maps used in the pretests and posttests?

3. Were students easily able to complete the pretests and posttests? YES NO

4. What would you like to see changed with the pretests and posttests? Please explain.

5. Please circle yes or no to the following 2 questions:
   Was the 15-minute time limit too short? YES NO
   Was the 15-minute time limit too long? YES NO

6. Please explain your answers to the 15-minute time limit questions in #5.

7. Do you believe an increase in student content knowledge was demonstrated after the posttest? Why or Why not?

8. Were the instructions for the pretest and posttest written clearly? YES NO

9. Did you teach any information about the specific 50 world places identified for the study? YES NO

10. Please explain your answer to #9 if you replied 'yes.'

11. Did you teach any information about identifying and locating ANY place names during the time set apart for the study? YES NO

12. Please explain your answer to #11 if you replied 'yes.'

13. What were the attitudes of your students following the pretest?

    What were the attitudes of your students before the posttest?

    What were the attitudes of your students during the posttest?

    What were the attitudes of your students following the posttest?

14. Did the investigator give you enough support during the Study? YES NO

15. Did the investigator give you enough materials during the Study? YES NO

16. Provide additional comments on any area of the Study below.

---------- TEACHER SURVEY ----------
Teacher-directed Instructions: Study

Directions:

Please answer the following questions to the best of your knowledge.
Your opinion is greatly appreciated.

1. Please provide some general information about your 4th grade class.

   - How many students are in your classroom? _____
   - How many students received teacher-directed instruction? _____

   - How many special needs students are in your classroom? _____
   - Please use the list provided to identify the 'type' of special needs you serve in your classroom, then provide the number of students with this need.

   5. Gifted #_____
   6. Autistic # _____
   7. LD #_____
   8. BD #_____
   5. Hearing impaired #_____
   6. Sight impaired #_____
   7. Other:

   - Please use the list provided to identify the number of males and female students.
     Male #_____ Female #_____

2. Were the charts a useful part of the instructions? YES NO
   Were the map transparencies a useful part of the instructions? YES NO

3. How were the charts helpful? Please explain.
   How were the charts not helpful? Please explain.

4. How were the map transparencies useful? Please explain.
   How were the map transparencies not useful? Please explain.

5. What is your opinion of the maps used in the pretests and posttests?

6. Were students easily able to complete the pretests and posttests? YES NO

7. What would you like to see changed with the pretests and posttests? Please explain.

8. Please circle yes or no to the following 2 questions:
   Was the 15-minute time limit too short? YES NO
   Was the 15-minute time limit too long? YES NO

9. Please explain your answers to the 15-minute time limit questions in #8.

10. Do you believe an increase in student content knowledge was demonstrated after the posttest? Why or Why not?

11. Were the teacher-directed instructions on the script written clearly? YES NO

12. Did you follow the teacher-directed instructions closely? YES NO

13. Please explain your answer to #12.

14. What would you like to see changed with the teacher-directed instructions? Please explain.

15. Do you plan to use the teacher-directed instruction method in your regular classroom instruction? YES NO

16. Please explain your answer to #15.

17. Did the investigator give you enough support during the Study? YES NO

18. Did the investigator give you enough materials during the Study? YES NO

19. Provide additional comments on any area of the Study below.

---------- TEACHER SURVEY ----------
Computer-assisted Instructions: Study

Directions:

Please answer the following questions to the best of your knowledge.
Your opinion is greatly appreciated.

1. Please provide some general information about your 4th grade class.

   - How many students are in your classroom? _____
   - How many students received teacher-directed instruction? _____

   - How many special needs students are in your classroom? _____
   - Please use the list provided to identify the 'type' of special needs you serve in your classroom, then provide the number of students with this need.
     1. Gifted #_____
     2. Autistic # _____
     3. LD #_____
     4. BD #_____
     5. Hearing impaired #_____
     6. Sight impaired #_____
     7. Other:

   a. Please use the list provided to identify the number of males and female students.
      Male #_____ Female #_____

2. What is your opinion of the maps used in the pretests and posttests?

3. Were students easily able to complete the pretests and posttests? YES NO

4. What would you like to see changed with the pretests and posttests? Please explain.

5. Please circle yes or no to the following 2 questions:
   Was the 15-minute time limit too short? YES NO
   Was the 15-minute time limit too long? YES NO

6. Please explain your answers to the 15-minute time limit questions in #5.

7. Do you believe an increase in student content knowledge was demonstrated after the posttest? Why or Why not?

8. Were the computer-assisted instructions on the script written clearly?
   YES NO

9. Did you follow the computer-assisted instructions closely? YES NO

10. Please explain your answer to #9.

11. What would you like to see changed with the teacher-directed instructions? Please explain.

12. Was the software, Click and Learn, easy to get to on the Internet? YES NO

13. Was Click and Learn easy for all students to use? YES NO
    Please explain if your answer was 'no.'

14. What would you like to see changed with the software program? Please explain.

15. Do you plan to use the computer-assisted instruction method in your regular classroom instruction? YES NO

16. Would you recommend Click and Learn software for teaching place names?
    YES NO

17. Did the investigator give you enough support during the Study? YES NO

18. Did the investigator give you enough materials during the Study? YES NO

19. Provide additional comments on any area of the Study below.

---------- TEACHER SURVEY ----------
Pilot Study

Directions:

Please answer the following questions to the best of your knowledge.
Your opinion is greatly appreciated.

1. Please provide some general information about your 4th grade classes.

   How many students are in class A receiving teacher-directed instruction?

   How many students from class A received parental consent to participate?

   How many students are in class B receiving computer-assisted instruction?

   How many students from class B received parental consent to participate?

2. Were the teacher-directed instructions on the script written clearly?
   YES NO

3. What would you like to see changed with the teacher-directed instructions? Comment below.

4. Were the charts a useful part of the instructions? YES NO

5. What is your opinion of the maps used in the pretests, posttests, and transparencies?

   50 States map:

   50 World Places map:

6. Was the 15-minute time limit too short? YES NO
   Was the 15-minute time limit too long? YES NO

7. Were the computer-assisted instructions for the teacher written clearly? YES NO

8. What would you like to see changed in the computer-directed instructions? Comment below.

9. Was the software, Click and Learn, easy to get to on the Internet? YES NO

10. Was Click and Learn easy to use? YES NO

11. What would you like to see changed with the software program? Comment below.

12. Were students easily able to complete the pretests and posttests? YES NO

13. What would you like to see changed with the pretests and posttests? Comment below.

14. Was increased student content knowledge demonstrated after the Pilot Study?
YES NO

15. Do you plan to use the teacher-directed instruction method in your regular classroom instruction?

YES NO

16. Do you plan to use the computer-assisted instruction method in your regular classroom instruction?

YES NO

17. Would you recommend Click and Learn software for teaching place names?
YES NO

18. Did the investigator give you enough support during the Pilot Study?

YES NO

19. Did the investigator give you enough materials during the Pilot Study?
YES NO

20. Provide additional comments on any area of the Pilot Study below.

APPENDIX H

STATISTICAL DATA

Chart 4.1a: Data Analysis
Group A and Group B: Frequency Statistics

		PRETEST	POSTTEST
N	Valid	43	43
	Missing	0	0
Mean		12.5116	37.2791
Std. Error of Mean		1.0063	2.0048
Median		12.0000	45.0000
Mode		7.00[a]	45.00[a]
Std. Deviation		6.5986	13 1463
Variance		43.5415	172.8250
Skewness		.671	-.838
Std. Error of Skewness		.361	.361
Kurtosis		.089	-.691
Std. Error of Kurtosis		.709	.709
Range		27.00	40.00

a. Multiple modes exist. The smallest value is shown

Chart 4.1b: Frequency Table

Group A and Group B: Pretest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00	2	4.7	4.7	4.7
	4.00	2	4.7	4.7	9.3
	5.00	2	4.7	4.7	14.0
	7.00	5	11.6	11.6	25.6
	8.00	3	7.0	7.0	32.6
	9.00	2	4.7	4.7	37.2
	10.00	2	4.7	4.7	41.9
	11.00	3	7.0	7.0	48.8
	12.00	2	4.7	4.7	53.5
	13.00	2	4.7	4.7	58.1
	14.00	5	11.6	11.6	69.8
	15.00	1	2.3	2.3	72.1
	16.00	3	7.0	7.0	79.1
	17.00	1	2.3	2.3	81.4
	18.00	1	2.3	2.3	83.7
	21.00	2	4.7	4.7	88.4
	22.00	1	2.3	2.3	90.7
	23.00	1	2.3	2.3	93.0
	24.00	1	2.3	2.3	95.3
	28.00	1	2.3	2.3	97.7
	29.00	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

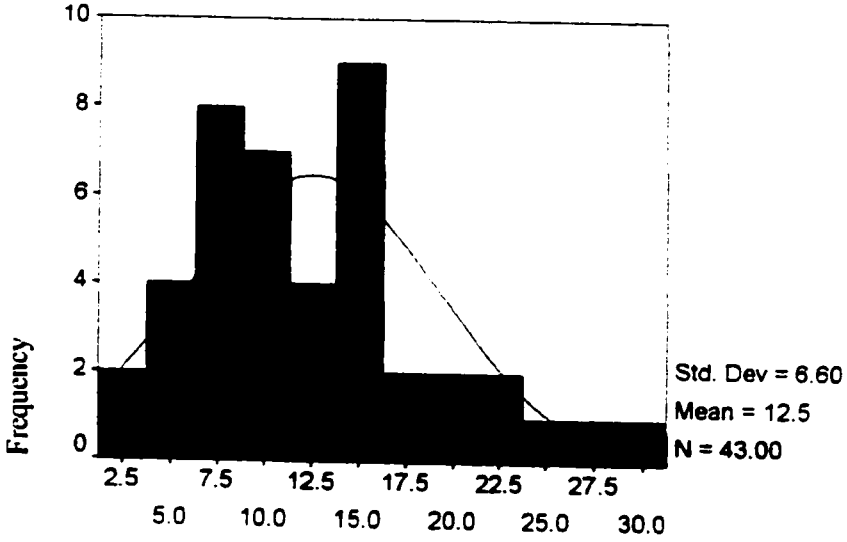
Group A and Group B: Posttest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10.00	2	4.7	4.7	4.7
	12.00	1	2.3	2.3	7.0
	14.00	1	2.3	2.3	9.3
	16.00	1	2.3	2.3	11.6
	17.00	1	2.3	2.3	14.0
	20.00	1	2.3	2.3	16.3
	21.00	1	2.3	2.3	18.6
	24.00	2	4.7	4.7	23.3
	26.00	1	2.3	2.3	25.6
	28.00	1	2.3	2.3	27.9
	29.00	1	2.3	2.3	30.2
	35.00	1	2.3	2.3	32.6
	36.00	2	4.7	4.7	37.2
	37.00	1	2.3	2.3	39.5
	39.00	2	4.7	4.7	44.2
	40.00	2	4.7	4.7	48.8
	45.00	7	16.3	16.3	65.1
	46.00	1	2.3	2.3	67.4
	48.00	4	9.3	9.3	76.7
	49.00	3	7.0	7.0	83.7
	50.00	7	16.3	16.3	100.0
	Total	43	100.0	100.0	

Chart 4.1c: Frequency Histogram

Group A and Group B:

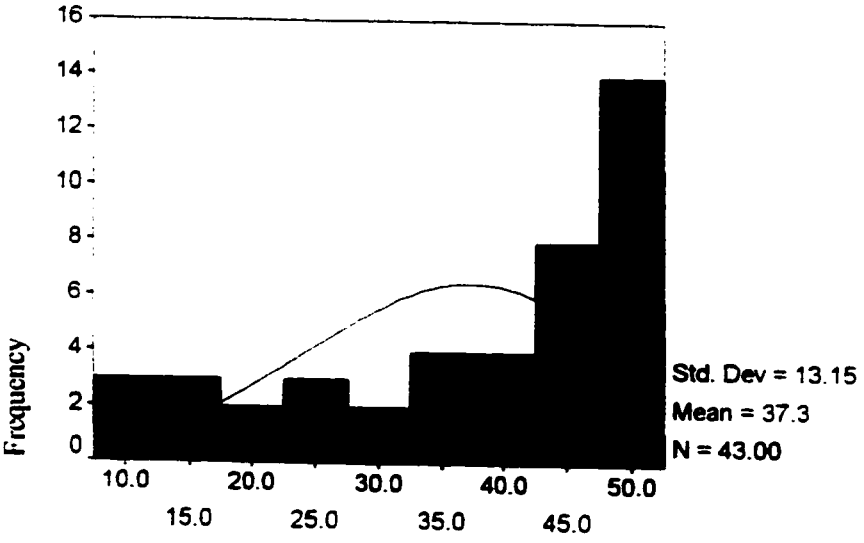
Combined Pretest Scores



PRETEST

Group A and Group B:

Combined Posttest Scores



POSTTEST

Chart 4.2a: Data Analysis
Group C: Frequency Statistics

		PRETEST	POSTTEST
N	Valid	20	20
	Missing	0	0
Mean		13.2500	13.3000
Std. Error of Mean		1.4919	1.5080
Median		12.0000	11.0000
Mode		9.00	9.00
Std. Deviation		6.6718	6.7442
Variance		44.5132	45.4842
Skewness		1.039	1.388
Std. Error of Skewness		.512	.512
Kurtosis		.515	2.506
Std. Error of Kurtosis		.992	.992
Range		24.00	29.00

Chart 4.2b: Frequency Table

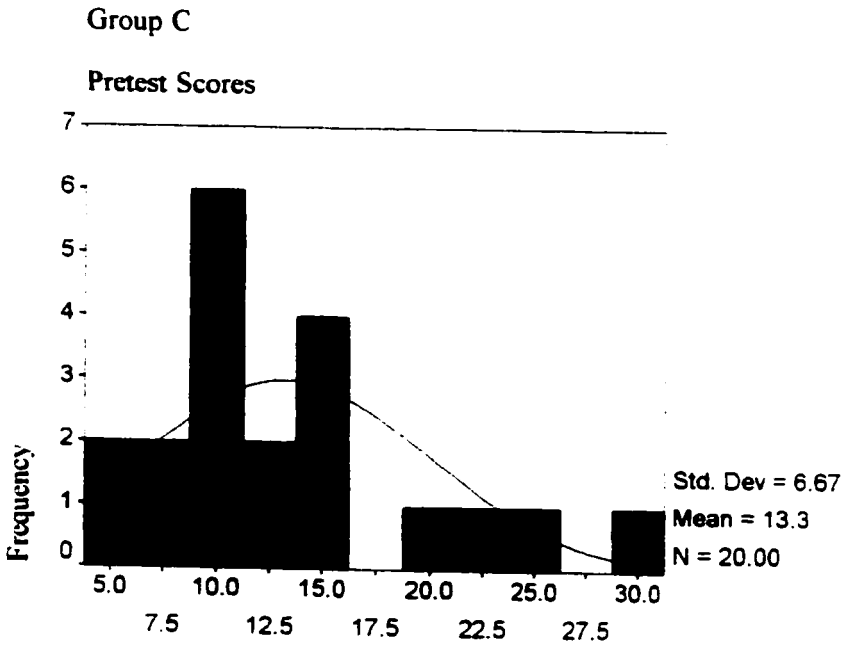
Group C: Pretest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5.00	2	10.0	10.0	10.0
	7.00	1	5.0	5.0	15.0
	8.00	1	5.0	5.0	20.0
	9.00	4	20.0	20.0	40.0
	10.00	1	5.0	5.0	45.0
	11.00	1	5.0	5.0	50.0
	13.00	2	10.0	10.0	60.0
	14.00	2	10.0	10.0	70.0
	16.00	2	10.0	10.0	80.0
	19.00	1	5.0	5.0	85.0
	23.00	1	5.0	5.0	90.0
	26.00	1	5.0	5.0	95.0
	29.00	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

Group C: Posttest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4.00	1	5.0	5.0	5.0
	7.00	1	5.0	5.0	10.0
	8.00	2	10.0	10.0	20.0
	9.00	4	20.0	20.0	40.0
	10.00	1	5.0	5.0	45.0
	11.00	2	10.0	10.0	55.0
	12.00	1	5.0	5.0	60.0
	15.00	1	5.0	5.0	65.0
	16.00	2	10.0	10.0	75.0
	18.00	2	10.0	10.0	85.0
	21.00	1	5.0	5.0	90.0
	22.00	1	5.0	5.0	95.0
	33.00	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

Chart 4.2c: Frequency Histogram



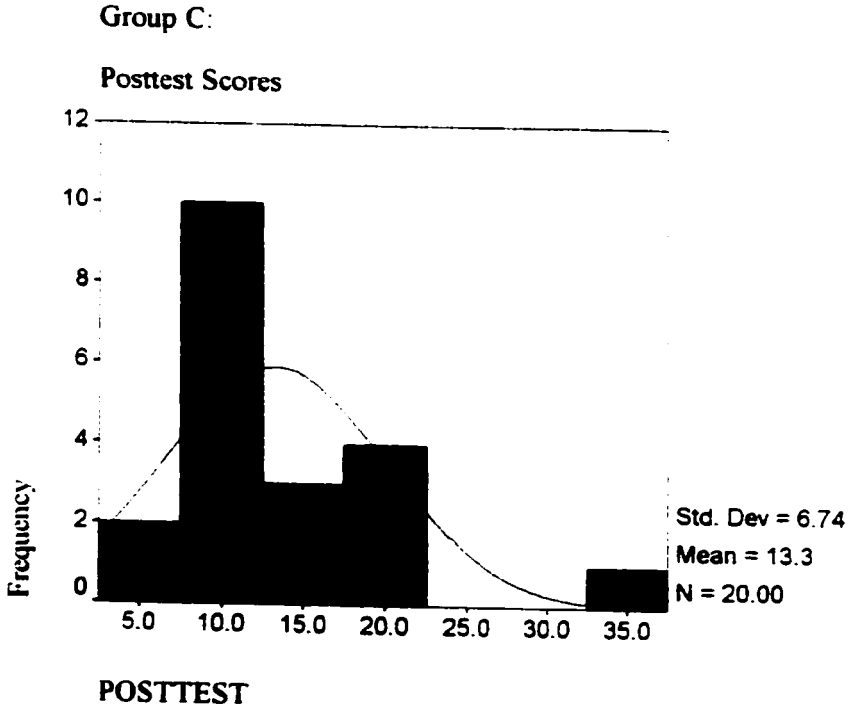


Chart 4.3a: Data Analysis

Group A: Frequency Statistics

		PRETEST	POSTTEST
N	Valid	22	22
	Missing	0	0
Mean		12.1818	30.6364
Std. Error of Mean		1.3685	2.9692
Median		11.5000	28.5000
Mode		7.00	10.00[a]
Std. Deviation		6.4190	13.9268
Variance		41.2035	193.9567
Skewness		.318	-.005
Std. Error of Skewness		.491	.491
Kurtosis		-.634	-1.407
Std. Error of Kurtosis		.953	.953
Range		22.00	40.00

a. Multiple modes exist. The smallest value is shown

Chart 4.3b: Frequency Table

Group A: Pretest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00	2	9.1	9.1	9.1
	5.00	1	4.5	4.5	13.6
	7.00	4	18.2	18.2	31.8
	9.00	1	4.5	4.5	36.4
	10.00	2	9.1	9.1	45.5
	11.00	1	4.5	4.5	50.0
	12.00	1	4.5	4.5	54.5
	14.00	3	13.6	13.6	68.2
	15.00	1	4.5	4.5	72.7
	16.00	2	9.1	9.1	81.8
	21.00	1	4.5	4.5	86.4
	22.00	1	4.5	4.5	90.9
	23.00	1	4.5	4.5	95.5
	24.00	1	4.5	4.5	100.0
	Total	22	100.0	100.0	

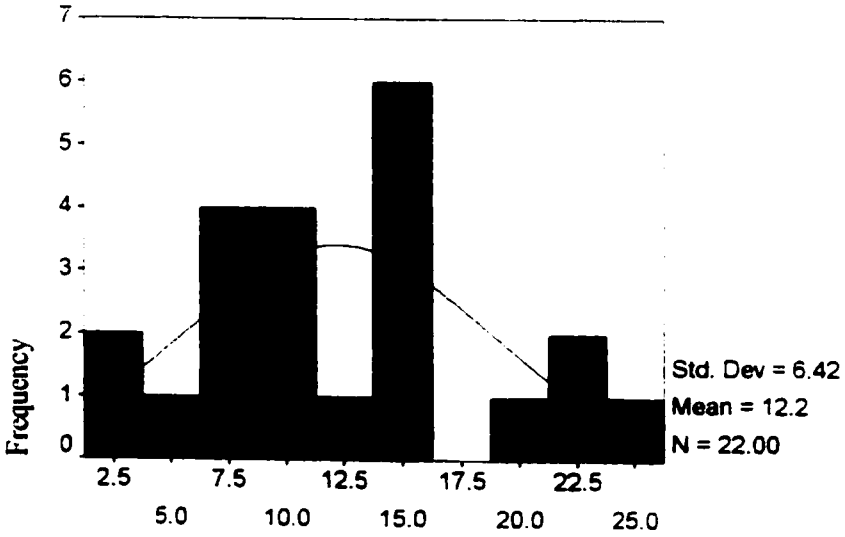
Group A: Posttest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10.00	2	9.1	9.1	9.1
	12.00	1	4.5	4.5	13.6
	14.00	1	4.5	4.5	18.2
	16.00	1	4.5	4.5	22.7
	20.00	1	4.5	4.5	27.3
	21.00	1	4.5	4.5	31.8
	24.00	2	9.1	9.1	40.9
	26.00	1	4.5	4.5	45.5
	28.00	1	4.5	4.5	50.0
	29.00	1	4.5	4.5	54.5
	36.00	1	4.5	4.5	59.1
	37.00	1	4.5	4.5	63.6
	39.00	1	4.5	4.5	68.2
	40.00	1	4.5	4.5	72.7
	45.00	1	4.5	4.5	77.3
	46.00	1	4.5	4.5	81.8
	48.00	1	4.5	4.5	86.4
	49.00	1	4.5	4.5	90.9
	50.00	2	9.1	9.1	100.0
	Total	22	100.0	100.0	

Chart 4.3c: Histogram

Group A:

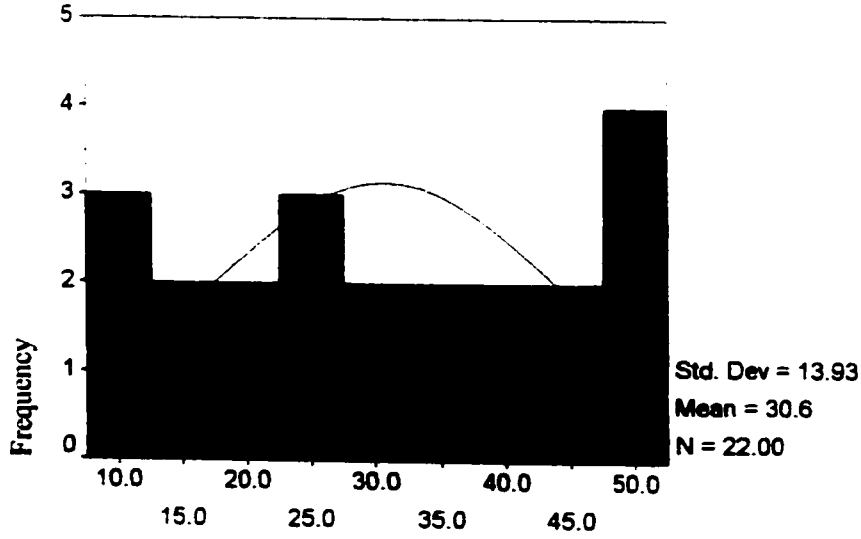
Pretest Scores



PRETEST

Group A:

Posttest Scores



POSTTEST

Chart 4.4a: Data Analysis

Group B: Frequency Statistics

		PRETEST	POSTTEST
N	Valid	21	21
	Missing	0	0
Mean		12.8571	44.2381
Std. Error of Mean		1.5107	1.6888
Median		12.0000	45.0000
Mode		8.00	45.00
Std. Deviation		6.9230	7.7389
Variance		47.9286	59.8905
Skewness		994	-2.437
Std. Error of Skewness		.501	.501
Kurtosis		.760	7.235
Std. Error of Kurtosis		.972	.972
Range		25.00	33.00

Chart 4.4b: Frequency Table

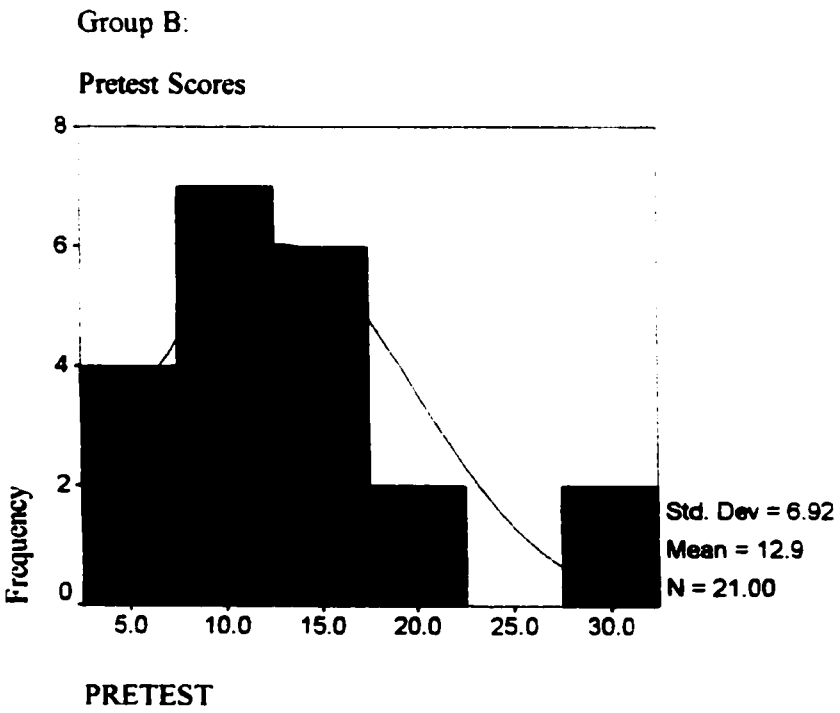
Group B: Pretest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4.00	2	9.5	9.5	9.5
	5.00	1	4.8	4.8	14.3
	7.00	1	4.8	4.8	19.0
	8.00	3	14.3	14.3	33.3
	9.00	1	4.8	4.8	38.1
	11.00	2	9.5	9.5	47.6
	12.00	1	4.8	4.8	52.4
	13.00	2	9.5	9.5	61.9
	14.00	2	9.5	9.5	71.4
	16.00	1	4.8	4.8	76.2
	17.00	1	4.8	4.8	81.0
	18.00	1	4.8	4.8	85.7
	21.00	1	4.8	4.8	90.5
	28.00	1	4.8	4.8	95.2
	29.00	1	4.8	4.8	100.0
	Total	21	100.0	100.0	

Group B: Posttest Scores

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	17.00	1	4.8	4.8	4.8
	35.00	1	4.8	4.8	9.5
	36.00	1	4.8	4.8	14.3
	39.00	1	4.8	4.8	19.0
	40.00	1	4.8	4.8	23.8
	45.00	6	28.6	28.6	52.4
	48.00	3	14.3	14.3	66.7
	49.00	2	9.5	9.5	76.2
	50.00	5	23.8	23.8	100.0
	Total	21	100.0	100.0	

Chart 4.4c: Frequency Histogram



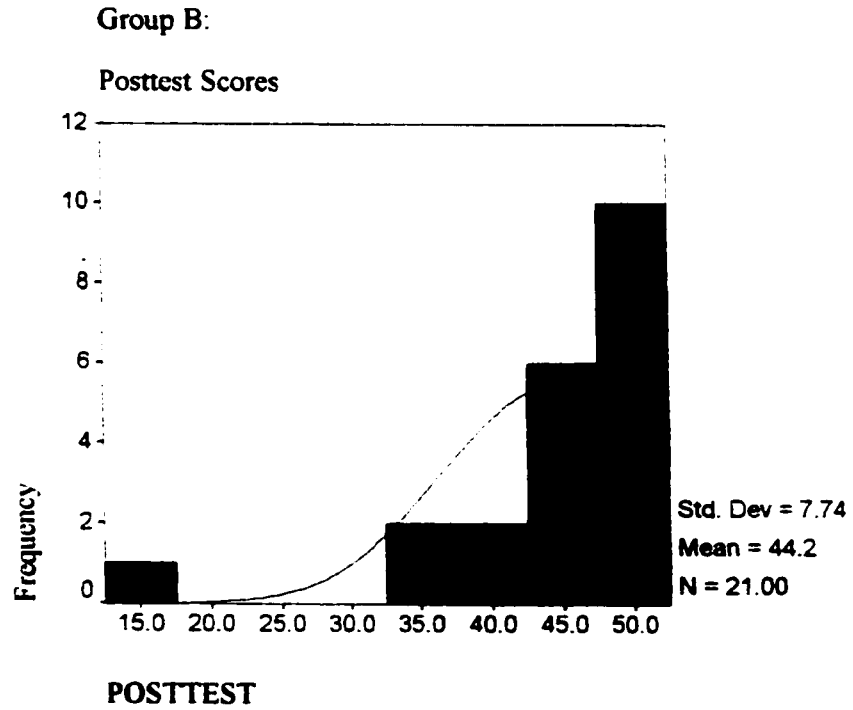


Table 1a: T-Test

Pilot Study, Group 1--50 States

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
PRETEST	9	34.8889	15.7595	5.2532
POSTTEST	9	38.0000	15.3786	5.1262

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
PRETEST	6.642	8	.000	34.8889	22.7751	47.0027
POSTTEST	7.413	8	.000	38.0000	26.1790	49.8210

Note: Group A received teacher-directed instruction over 50 States place names.
n = 9
Pretest: x = 34.89 t = 6.642
Posttest: x = 38.0 t = 7.413

Table 1b: T-Test

Pilot Study, Group 2--50 States

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
STATPRE	6	34.5000	10.6724	4.3570
STATPOS	6	39.0000	14.4222	5.8878

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
STATPRE	7.918	5	.001	34.5000	23.3000	45.7000
STATPOS	6.624	5	.001	39.0000	23.8648	54.1352

Note: Group 2 received computer-assisted instruction over 50 State place names.
n = 6
Pretest: $\bar{x} = 34.50$ $t = 7.918$
Posttest: $\bar{x} = 39.0$ $t = 6.624$

Table 1c: T-Test

Pilot Study, Group 1--50 World Places

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
PRETEST	9	7.3333	5.4083	1.8028
POSTTEST	9	12.0000	6.2849	2.0950

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
PRETEST	4.068	8	.004	7.3333	3.1761	11.4905
POSTTEST	5.728	8	.000	12.0000	7.1690	16.8310

Note: Group 1 received teacher-directed instruction over 50 States place names.
n = 9
50 World Places Pretest: x = 7.33 t = 4.068
50 World Places Posttest: x = 12.0 t = 5.728

Table 1d: T-Test

Pilot Study, Group 2--50 World Places

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
PRETEST	6	9.3333	5.5377	2.2608
POSTTEST	6	18.0000	11.6619	4.7610

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
PRETEST	4.128	5	.009	9.3333	3.5218	15.1448
POSTTEST	3.781	5	.013	18.0000	5.7616	30.2384

Note: Group 2 received computer-assisted instruction over 50 World Place names.
n = 6
50 World Places Pretest: x = 9.33 t = 4.128
50 World Places Posttest: x = 18.0 t = 3.781