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INSTRUCTIONAL ENVIRONMENTS FOR TECHNOLOGY INSERVICE EDUCATION

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Education

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ABSTRACT

This study examines different instructional formats for providing inservice education on classroom technology applications to elementary teachers. An intensive weekend workshop format was compared with a traditionally paced format for inservice education. Results are discussed in terms of measurable changes in teacher growth in the use of the applications and growth in the use of the applications with students. A secondary purpose was to determine if there was a relationship between learning styles and success in these two environments. Teachers' learning styles were identified using the Myers-Briggs Type Indicator. The results of the study indicate that intensive models of inservice education are as effective as traditional models in this context. The study was inconclusive with respect to learning styles relationships; however the data suggest that further research is warranted.
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CHAPTER 1

Introduction

Technology is rapidly changing much of the way the world operates. Its infusion into our culture is occurring at a frenetic pace. Work places are changing, employment skills are shifting, new knowledge is being required and people are having to learn new ways to relate to different information sources and to communicate locally and globally with others (Long, 1983; U.S. Congress, 1995).

Recognizing their responsibility to educate students for living and working in this technological society, school personnel have begun employing technological innovations such as calculators, computers and modems for telecommunications to respond to these needs. It is estimated that every year in the past decade, between 300,000 and 400,000 computers have been added to schools’ inventories to meet these increasing demands (U.S. Congress, 1995).

Despite this increasing availability of technology, one of the key findings of the 1995 U.S. Congress report by the Office of Technology Assessment (OTA), was that “substantial numbers of teachers report little or no use of computers for instruction” (p.1). The barriers the report cited include: access to appropriate technology, technical and logistical problems, lack of training and support, and the need for more knowledge about how to integrate computers into the curriculum (U.S. Congress, 1995). An additional key finding in the OTA report
was that "most teachers have not had adequate training to prepare them to use
technology effectively in teaching" (p.2). The key to connecting our students with
technology is the teacher (Collis & Carleer, 1992; Evans-Andris, 1995; U.S.
Congress, 1995). Developing and providing inservice models that help educate
our teachers about how to effectively use technology in the classroom will
provide a means for students to experience the full potential technology has
to offer as they prepare for living and working in the twenty-first century.

The present study addresses the issue of inservice education models for
classroom technology applications.

Statement of the Problem

A school district in the southwestern part of the United States allocated
funds this past year to put a computer in every elementary classroom. Many of
the teachers were unsure of what to do with this new tool and had many
unanswered questions and concerns about how to use computers to meet the
diverse needs of the students. They also had concerns about finding the time to
learn about this new technology.

This thesis was a research-based, inservice education project that
addressed those needs and began the process of preparing the teachers for
effective use of classroom technology applications. The study involved two
groups of teachers learning the same technology applications through the same
methods, but with a choice of an intensive two-day program or a five week
traditional program. A 15-hour classroom technology application module was
developed with four segments. The first three segments were four-hour
Instructional sessions in which educational applications were introduced and practiced. The fourth segment was a three-hour joint sharing session in which both groups presented examples of work they had done with students. To address the time constraints of the teachers, the workshop was offered in two different formats. One format was the traditional inservice workshop format: each instructional segment was offered in a separate after school session spaced two weeks apart. The other format was an intensive format: the instructional segments were offered on Friday evening, the following Saturday morning and Saturday afternoon. The fourth, joint sharing segment was offered one week after the completion of the traditional sessions and five weeks after the completion of the intensive segments.

Purpose of the Study

The purpose of this study was to determine if any measurable differences could be detected in teachers' growth in computer applications between teachers who learn in intensive course environments versus teachers who learn in traditionally spaced course environments. This study also sought to determine if there was any relationship between learning styles and success in these specific environments.

The independent variable for this study was the instructional environment (intensive or traditional). The dependent variable was the score on the questionnaires.

Specific questions this study sought to answer were:
1) Is the intensive instructional environment an effective inservice model for computer application instruction when compared to the traditional instructional environment?

2) Is there a relationship between learning styles and success in specific instructional environments?

Definition of Terms

For the purposes of this study, definitions were established for specific terms related to the subject.

They are as follows:

**Inservice education or staff development**: any planned program of learning opportunities afforded to teachers for the purpose of improving performance.

**Instructional technology**: the application of scientific knowledge about human learning to the practical tasks of teaching and learning.

**Learning styles**: "composite characteristic cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe & Ferrell, 1990, p. 59).

Terms specific to Myers-Briggs Preferences:

**Extraversion** (E) - person's interests tend to be the outer world of actions, objects and other people (Lawrence, 1987).

**Introversion** (I) - person's interests tend to be the inner world of concepts and ideas (Lawrence, 1987).
**Intuition** (N) - person prefers to perceive the possibilities, relationships and meanings of experiences (Lawrence, 1987).

**Sensing** (S) - person prefers to perceive the immediate, real, practical facts of experiences (Lawrence, 1987)
CHAPTER 2

Review of Literature

This review of literature is divided into three sections that provide information in understanding several evolutions of change which are relevant to this study. The first section focuses on staff development. The second section provides information on integration of technology in the classroom. The final section addresses the theoretical framework that guided this study.

Staff Development

Early Staff Development

Inservice education began over a century ago (Orlich, 1989). It arose in the mid-1800's from the need to remedy deficiencies of teachers who had often not received any formal education for the job and who were pressed into classroom service to meet the needs of a growing student population. The training was structured as two- or three-day institutes or evening work sessions to help teachers gather practical ideas to apply in the classroom (Tyler, 1971).

At the turn of the century, summer session inservice programs were conducted at normal schools to continue the task of remediating the deficiencies in teachers' entry preparations. States assumed regulation of teacher certification, requiring many of the teachers to complete a bachelor's degree (Orlich, 1989). Colleges and universities began offering correspondence and extension courses to teachers. This early inservice
education was basically remedial in nature and designed to meet certification and degree requirements rather than promote individual teacher growth. One notable exception during this period was the Eight-Year Study which began in 1933. A select group of teachers in thirty schools advanced from remedial to "creative inservice education." They designed educational programs aimed at the development of youth and the maintenance and improvement of society (Tyler, 1971). Staff development had briefly achieved a pro-active period, rather than a reactive mode (Harris, 1989). It was also during this time that the "workshop" format was developed for inservice projects (Orlich, 1989).

Typically, workshops involved an intensive, informal period of study with expert assistance to meet the existing needs of the participants. Workshops helped develop working relationships with others as well as motivated participants to change their behavior based on the information presented. They were offered in a flexible format and could be adapted to diverse groups and situations (Tyler, 1971; Moffitt, 1963).

Topics and subject matter for staff development were a reflection of the educational context and pedagogy of the times. Philosophically, during this early period, the design and development of teaching was predominated by behaviorist theories (Melton, 1990). The movement was guided by Skinner (1957), who based his philosophies of learning for human beings on his observations of learning in animals. When these theories were applied to human learning, the concepts tended to focus on lower cognitive processes with motives controlled through conditioning. This led to a curriculum that was
programmed in small step by step units that focused on immediately observable and measurable learning outcomes (Saettler, 1990). Behavioral objectives were used to guide the teaching process and denote when student learning had taken place. Staff development was directed at helping teachers learn how to implement behavioral procedures for instruction. Early texts in this field reflect little research or learning theory but indicated a growing reliance on statistical measurement and aspects of social efficiency (De Vaney & Butler, 1996).

Staff development continued in its early mode of remediation until shortly after World War II, then subtle changes began to evolve with programs oriented toward curriculum development rather than remediation (Orlich, 1989). The end of the war also brought a baby boom and in its wake another teacher shortage, and thousands of "teachers" received emergency certificates to help staff the nation's classrooms (Orlich, 1989).

Learning theories used in schools and inservice education programs during this time were heavily influenced by training procedures developed in the military services. In the early 1940's, audiovisual scholars became involved with military training as the nation became focused on the war effort. The training research conducted at this time gave rise to the modern field of educational technology, and gave separate definitions to the concepts of educational technology and instructional technology (De Vaney & Butler, 1996). The military helped establish the new standard for training. With the need to quickly train thousands of recruits with varying levels of ability, instruction was reduced to its simplest terms with precise objectives and specific, behavioral
evaluation measures. Concepts were broken down into small, sequential pieces that needed to be taught and tested before the next piece was introduced. The teaching cycle had two phases for the teacher: teaching and testing. This military-designed teaching format based on behavioral theory eventually made its way into teacher inservice programs and classrooms during the 60's and 70's, and is still a technique used in instructional design to this day (De Vaney & Butler, 1996).

Extensive efforts by social psychologists ushered in a "group process" era in which role playing, brainstorming, discussion leading and buzz group techniques were being promoted (Harris, 1989). The emphasis was on process, procedures and techniques. By the late 1950's, inservice education was recognized as a distinctive operation in school programs and was the subject of a yearbook by the National Society for the Study of Education (Harris, 1989). The concept of professional growth advocated continuous and constant effort for inservice education rather than erratic, occasional activities.

The 1960's were viewed as education's decade of innovations (Dillon-Peterson, 1981). "There was a lively excitement and acceptance of the idea of trying new things in the nation's classrooms" (Dillon-Peterson, 1981, p.1). This theme of innovation was also apparent in the field of inservice education. A laboratory approach was introduced which stressed active, purposeful involvement in learning for participants rather than a passive approach. The underlying rationale for this approach was that one was more likely to
remember and use learning that was derived from personal experiences rather than merely listening to someone tell about it (Harris, 1969).

Inservice education came to be viewed as a process for change and an instrument to bring about changes in education. Consequently, topics evolved to include materials development, innovative programming, and organizational restructuring for learning. Federal programs such as the Education Professions Development Act and the Elementary and Secondary Education Act, initiated changes in instructional programs in schools and stimulated inservice activities for facilitating those changes (Harris, 1989). Despite this growth in the field, the emphasis for inservice education remained on program change rather than the individual needs of the teacher for personal growth as a professional (Harris, 1989).

In the area of learning theories and inservice education, behavioral objectives gave way to instructional objectives (Harris, 1969). The fundamental aspects of teaching were viewed as: planning instruction, selecting instructional activities and evaluating instruction. The latter term was a new step added to the educational process. The emphasis was on setting precise instructional objectives and defining specific acceptable criterion for student performance objectives. In order to be quantified, the performance terms had to describe a visible behavior such as saying, writing, or listing rather than an internal behavior such as understanding, believing, or appreciating. The outcomes of the student objectives were then taken one step further and used as a basis to evaluate the instruction (Harris, 1969). A new phase had been added to the
teaching cycle: using student testing results to evaluate instruction. This new phase of evaluating instruction was incorporated as subject matter for inservice education.

**Inservice Education**

The 1970's and 80's brought a period of markedly increased research in the area of staff development and acknowledgment that inservice education for teachers was a central component for improving education. Studies analyzed various pieces of the process, but none provided a clear direction for the future. Thomas Guskey (1986) made the observation that "...the history of staff development is characterized primarily by disorder, conflict, and criticism" (p.5).

The situation was compounded further with the realization that adult development and concerns had seldom been given consideration when designing inservice education (Willie & Howey, 1980). However, research in the field of adult learning was also in a state of disarray with Brockett and Darkenwald (1987) noting: "a criticism of much adult learning research to date has been the disjointed or scattered nature of such efforts" (p.30).

Additional research from Kane and Chase (1983) ties these two strands together in a list of factors for failure of staff development to meet the needs of participants: lack of coordination, no teacher involvement in planning, little knowledge of adult learning, and ignorance of research on effective teaching. Many researchers agreed with Guskey (1986) that quality staff development should be a central component for improving education, but each offered different theories on how best to accomplish that task (Orlich, 1989; Harris,
1989; Showers, Joyce & Bennett, 1987). Orlich (1989) viewed staff development as an umbrella term and cited E. Lawrence Dale's model as a guide to the six functions contained under staff development: inservice education, organization development, consultation, communication and coordination of resources, leadership training, and evaluation. Harris (1989) used an adapted model that showed inservice education as part of the training arm of staff development with elements of clients served, timing of training, design and content of learning, and system relationships among other topics. Showers, Joyce and Bennett (1987) proposed a design model based on people, social context, training components, and degrees of implementation. And Guskey (1986) offered an outcome-based model for staff development based on changes in teachers’ classroom practices, student learning outcomes, and teachers’ beliefs and attitudes. No one model was offered as an ideal, but the shift was clearly away from remediation of teachers “deficient” skills to development of the teacher as an adult learner.

The 1990’s brought several changes into the scope of staff development. The view was shifting from teaching as a technology where decisions about what to teach were made by others, to teaching as a craft where changes were made by teachers based on experiential learning (Mathison, 1992). Attempts were being made to evaluate the effectiveness of inservice education as it related to classroom applications rather than relying solely on teacher feedback (Mathison, 1992). Staff development was being divided into specialized areas, such as technology education, and teachers were being viewed as both
recipients and resources of learning (Cates, 1995). Hyde and Pink (1992) offered a proactive vision for staff development based on the three conceptions of theory, research and analytical reflection of educator's experience. Teachers were also becoming part of the decision-making process for planning staff development programs (Bailey & Lumley, 1994). They were developing their voice and becoming proactive learners rather than reactive students to changes in education.

In the development of inservice education models, research concludes that there is no one best model or design (Harris, 1989; Bailey & Lumley, 1994; Goldberg & Richards, 1995). However, Harris (1989) maintains that there are principles which should guide ideas for planning. Included are topics such as clients, timing, involvement, content and design. It's interesting to note that Harris (1989) includes in these principles that no one should be required to participate. Similar sentiments are echoed by Hyde and Pink (1992) who also believe that "custom tailoring" of the models should be done by each school. When considering time schedules for implementation, Showers, Joyce and Bennett (1987) found no experimental studies on timing and concentration of schedules for staff development training and suggested that the schedule did not matter as much as the social context, substance, and process.

**Inservice Technology Education**

"The evolution of computers in learning has not occurred in isolation. Rather it is an interactive byproduct of ongoing developments in psychology, pedagogy and technology (Atkins, 1993; Hannafin, 1992)" (as cited in
Successful models for staff development in technology are in evidence. Train-the-trainers models target key teachers for technology training who, in turn, train peers (U.S. Congress, 1995; Sturdivant, 1989). Mentoring models pair experienced computer-using teachers with a specific number of beginning teachers (MacArthur, Pilato, Kercher, Peterson, Malouf & Jamison, 1995). Computer coordinator models provide school-based teachers with release time to coordinate the integration of educational computing (Strudler, 1995-1996). Collaborative models between universities and school districts allow for shared resources and expertise between faculties (Grandgenett & Mortenson, 1993). All of these models stress the need for a sustained, ongoing commitment to staff development. Inservice education has a place in that plan. "Research indicates that teachers need both inservice education on specific technology applications and long-term support in order to integrate computers with the curriculum in meaningful ways (Goodson, 1991; MacArthur & Malouf, 1990; Woodhouse & Jones, 1988)" (as cited in MacArthur, et al, 1995, p.47). A critical motivating factor that contributes specifically to teachers' learning and achievement with technology is the support and collegiality they experience with their peers (Sheingold & Hadley, 1990; Boe, 1989). This support is necessary both in their schools and districts to sustain the long term commitment necessary for effective technology integration (Sheingold & Hadley, 1990).
Another area addressed in research is the concept of teaching technology in context rather than a topic unto itself (Callister & Burbules, 1990; Willis, 1993). In order for teachers to understand how the computer is used in the classroom, they need to be taught curriculum related applications they can use with their students rather than how a computer operates. Willis (1993) suggests "it may be more important to first learn what a program can do rather than how to do it" (p.24).

Adult Learning

A recent study by Eckart (1995) revealed that a significant number of adult foreign language learners found the traditional evening/day class pattern too slow and preferred an intensive course of study because they were eager to make rapid progress. Findings included that adult students attending the intensive language course were not homogenous in either background characteristics or motivation. Their reasons for choosing the intensive course of study included convenience, preference for intensive learning, and to revise or consolidate existing knowledge (Eckart, 1995). Additional research in adult learning states that adults have a positive response to learning sessions that are uninterrupted and extend over a substantial span of time (Lenz, 1982).

Adults demonstrate a need to be actively involved, and to apply what is learned through actions such as creating materials for future reference. They respond best in a safe, noncompetitive environment that allows time to practice acquisition of new skills (Lenz, 1982; Hurst, 1994). For teachers, combinations of demonstrations and theories are not enough to sustain classroom practice.
unless they are accompanied by opportunities to practice in the training setting (Showers, Joyce & Bennett, 1987). Feedback is critical during adult learning process and can come from instructors, peers, or the learners themselves (Ferrence & Vockell, 1994; Lenz, 1982). Printed material that helps adults recall needed information for later practice was also found to be beneficial (Ferrence & Vockell, 1994).

Technology Integration in the Classroom

Early Classroom Technology

During the early 1900's, technology began entering the classrooms. According to Saettler (as cited in Cuban, 1986), motion pictures were first used in the classroom in 1910. As their use increased, the area of audiovisual instruction was promoted by many, from educators to film makers to government and other media enthusiasts. By the 1930’s, researchers consistently claimed that films motivated students to learn and 25 states had devoted units to films and related media in their departments of education (Cuban, 1986; De Vaney & Butler, 1996). However, later research indicated that most teachers seldom used films in the classroom. The chief obstacles were: lack of skill in using the equipment, inaccessibility of equipment and cost (Cuban, 1986).

During the 1920's, radio was introduced to the classroom. Commercial stations, school districts, universities and state departments of education began producing and airing programs for the classroom (Cuban, 1986). But it, too, failed to live up to the dream to become "as common in the classroom as is the
blackboard." Reasons given included unsatisfactory or no equipment, scheduling difficulties and lack of information (Cuban, 1986).

During the 1950's, television was introduced to the classroom (Cuban, 1986). In 1952 the FCC allocated 242 channels for educational purposes (De Vaney & Butler, 1996). Closed circuit broadcasts can be traced to Los Angeles in 1939, but other accounts credit the first broadcast to KUHT in Houston, Texas on May 25, 1953 (Cuban, 1986). The medium received a giant boost from the Ford Foundation during the 50's which funded a multi-million dollar investment to underwrite the initial use of the medium in schools and colleges. This sponsorship helped provide funds to improve the quality of classroom videos which were used to help counteract the severe shortage of teachers caused by rising enrollments from the baby boom (Cuban, 1986). A new era had begun with a new medium for instruction.

Research on the effectiveness of film use for instruction at this time revealed that it depended on the context of use and the relationship of the film content to the audience (De Vaney & Butler, 1996). Research also found that film was adequate for teaching concepts, good for teaching facts and had some effect on motivation and opinion (De Vaney & Butler, 1996).

During the 1960's there was a growth in the use of the media of films and television. With the development of magnetic tape and videocassette recorders in the late 50's, the technological innovation of videocassettes expanded the flexibility and delivery of video into the classroom (Seels, Berry, Fullerton & Hom, 1996). In 1962 the world saw the advent of satellite communications and
the beginnings of instantaneous global communications. This visual medium was viewed as a powerful instructional tool. Research indicated that there were no significant differences between film instruction and traditional classroom (face-to-face) instruction. Rather than a disappointment, this was viewed as a positive result because it suggested that film instruction could be considered as a reasonable alternative to classroom instruction and, possibly, a more desirable instructional choice (Seels, Berry, Fullerton & Hom, 1996).

Computers in the Classroom

The 1980's brought the advent of microcomputers in the classroom. In 1982, the editors of Time Magazine featured the computer as "Man of the Year." Once again, the nation was swept up in the possibilities of a new technology. The introductory cycle of computers followed the path of previous technological innovations: predictions of extraordinary changes, followed by academic studies of effectiveness, followed by teacher reports of problems with hardware and logistics, and lack of training (Cuban, 1986). Saettler (1990), too, observed the beginnings of this same cyclic repetition of earlier technological innovations in the classroom with the introduction of computers. "Even though some may protest that the computer is different and that it will not repeat this pattern, history teaches us that it is still too early to reach a definitive conclusion. The verdict is not yet in" (Saettler, 1990, p. 405).

However, long term research on computers in the classroom begun in 1986 by Apple Classrooms of Tomorrow (ACOT) began documenting changes in the classroom learning environment as students and teachers received support and
training during the integration of technology into the curriculum (Dwyer, 1994). The research was started in seven classrooms across the country that represented a cross-section of America's K-12 schools. All participating teachers and students were provided with two computers for home and school (Dwyer, 1994). ACOT researchers noted that in the early stages of introduction, the focus was on the innovation: computers and software (Dwyer, Ringstaff & Sandholtz, 1991). "Gradually, however, new patterns of teaching and learning emerged at all sites" (Dwyer, Ringstaff & Sandholtz, 1991, p.47). The researchers viewed the changes as an evolutionary process with five stages: entry, adoption, adaptation, appropriation, and invention (Dwyer, Ringstaff & Sandholtz, 1991). It was noted that teachers' instructional beliefs and practices underwent an evolution as they appropriated technology for personal use that resulted in improvement in student competencies (Dwyer, 1994). Appropriate use of technology with adequate technical support served as a catalyst for change in the classroom from curriculum-based, didactic, instructional environments to student-centered, constructive, learning environments (Dwyer, 1994).

During the 1990's, the second generation of computers was entering the classrooms with modems and faster processing speeds. Access to the Internet was also becoming available to schools, bringing instant links to other schools, libraries, museums and the rest of the world. CD-ROMs were adding capabilities for hypermedia, a system which links various forms of information such as video and audio in a text-based program, and increased opportunities
for student authorship and higher-order critical thinking about subject matter (Jonassen, 1996).

According to the Office of Technology Assessment (OTA) report, by Spring 1995, United States' schools were projected to have 5.8 million computers for instructional use. Yet, in that same report, a substantial number of teachers reported that they did not use computers for instruction. The barriers they cited included: access to appropriate technology, technical and logistical problems, lack of training and support, and the need for more knowledge about how to integrate computers into the curriculum (U.S. Congress, 1995). With technology, the classroom was seemingly expanding and the world was seeming smaller, but the cycle for technological change appeared to be repeating itself.

Theoretical Framework

Learning Theories

Learning theories have changed from behaviorist to cognitive (Clark & Sugrue, 1988). In behavioral theories, learning is viewed as a response to changes in a stimulus or environment. In cognitive theory, learning is viewed as a constructive process with the learner actively engaged while integrating new knowledge with old (Clark & Sugrue, 1988). Learning was seen as a complex process with many interacting elements. Cronbach and Snow's (1977) research on aptitude treatment interaction (ATI) proposed that ATI effects occur independently in different individuals and that instructional conditions (treatment) will determine which types of individuals (aptitude) will learn most rapidly in a specific situation.
Gardner (1991) offered a theory on multiple intelligences which suggested that students learn in ways that are identifiably distinctive. Gardner theorized that students possess different kinds of minds and consequently they learn, remember, perform and understand in many different ways.

Cognitivism, collaboration and cooperation are classroom strategies for the 1990's (Cates, 1995; & Jonassen 1996). Learners who construct their own meaning and representations will better remember and comprehend what they learn than learners who merely listen. Individuals who cooperate in groups can collaboratively build more meaningful knowledge than they can through individual work (Jonassen, 1996). Students who are offered opportunities to use their preferred learning style will have higher achievement, improved self-concept, and a more positive attitude (Reiff, 1992). The teaching cycle is merging with the learning cycle and now includes elements of active involvement for the learner, recognition of individual learner characteristics, and ongoing reflection for the teacher.

As the cycles for learning and teaching begin to merge, a picture of interdependent support begins to emerge for this study. Effective teaching takes into consideration the needs and characteristics of the learner, and the learner views the teacher as a resource for expanded learning. The focus needs to shift from teaching the subject matter to helping the student acquire and use knowledge. The inclusion of ongoing reflection provides opportunities for analyzing, improving, and diversifying instruction.
Learning Styles Theory

After a decade-long interest in learning styles concepts and brain behavior, the National Association of Secondary School Principals (NASSP) defined learning styles as "characteristic cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Keefe, 1987, p.5). Learning styles theorists offered the model that learning is an interactive process between the students and the teacher within a specific learning environment (Keefe, 1987). Each learner brings a unique set of characteristics based on cognitive, affective, and psychological traits to the learning process. These characteristic differences or personality types form the basis for each individual's learning style. This learning style is a consistent trait that reflects how individuals optimally prefer to process information and best respond to a learning situation (Harrison, 1997; Lawrence, 1987). For example, some people may prefer to learn by participating in small group discussions and verbally processing information. Others may prefer to learn by listening to a lecture and internally processing information, while others may prefer to learn by active involvement in a lesson and physically processing the information. Teaching and learning are viewed as complex activities with many human factors affecting the acquisition of subject matter.

If instruction is offered in only one of these methods, then individuals who prefer alternate methods of instruction are short-changed. Based on this information, a key to effective instruction is "to design instruction and materials
that respond directly to individual learning needs” (Keefe, 1987, p.2). According to Bonham (1989), educating teachers about their own learning styles can help them broaden the range of styles they use in the classroom. Once they understand their own styles, teachers can better understand the individual differences of students. Awareness of these styles coupled with an understanding of technology can allow teachers to make more informed judgments in meeting the needs of students (Florini, 1989).

There is very little research in the area of teacher learning styles and technology inservice education. One study was identified on this topic. Rude-Parkins, Baugh and Petrosko (1993) did a study aimed at identifying personality type of high school teachers who participated in technology inservice training. They found that type (style) did not appear to influence levels of technology adoption with high school teachers. Their study, using the Myers-Briggs Type Indicator, noted a higher percentage of Introvert-Intuiting-Thinking-Judging (INTJ) type participating in the first round of technology training, and led to their suggestion that type (style) seems to influence those who commit to technology first. No research was found on this topic for elementary teachers.

Summary

Incorporating learning styles in this study with elementary teachers will further research on this topic. It will also offer a method for helping teachers begin to recognize the unique set of characteristics that each individual possesses. Becoming aware of their own style and preferred method for learning while in a setting that recognizes other styles and preferences for
learning among their peers opens up opportunities for reflection and personal growth.

Providing two instructional formats allows for recognition of individual characteristics and the diverse needs of the participants. It supports the concept of providing choices or options for participants in the learning process. Also, providing multiple models for teaching and instruction, such as demonstration, guided practice, cooperative learning, and individual learning, supports the concept of meeting diverse needs and allows for a choice in the preferred method of learning.

Demonstrations, hands-on practice time, detailed worksheets, projects focused on practical classroom technology applications, a noncompetitive environment, and opportunities to receive feedback are pedagogical practices recommended for effective adult learning. A critical motivating factor found in inservice technology education is building experiences for collegiality and support among peers, so group project activities included opportunities to provide feedback to colleagues. Group brainstorming sessions also incorporate opportunities for sharing ideas. These activities, combined in a constructivist approach that addresses diverse learning styles, provided the framework for this study.

Fullan (1982) emphasized that change is a process and not an event. Research has addressed the change that teachers will need to make in their practices as they learn to deal with technology. In order for teachers to begin the process of technology integration, they must first be exposed to the technology
and what it can do in the classroom (Willis, 1993). Inservice education on specific technology applications to provide knowledge and support during the learning process is necessary along with long-term support provided by schools and districts to accommodate this process of change (MacArthur, et al, 1995). It is through their knowledge and beliefs that teachers implement changes in their teaching (Borko & Putnam, 1989). Opportunities should be provided to support the teacher's development as a reflective practitioner to accommodate this process of change (Eraut, 1989). Changes in teachers' attitudes often do not come about until after teachers see a change in student learning (Guskey, 1986). Sheingold and Hadley (1990) found that teachers who integrate the computer change a teacher-centered classroom into a student-centered one.

There is much to consider when planning inservice technology education for teachers. However, one theme that showed up repeatedly in research is that the key to successful inservice education and technology integration is to focus on the teacher rather than the technology (Boe, 1989; Collis & Carlear, 1992; Hurst, 1994; Sheingold & Hadley, 1990; U.S. Congress, 1995).
CHAPTER 3

Methods and Procedures

The study proposed to determine if any measurable differences could be detected in teachers' growth in computer applications between teachers who learn in intensive course environments versus teachers who learn in traditional (spaced) course environments. This study also sought to determine if there was any relationship between learning styles and success in these specific environments.

The independent variable for this study was the instructional environment (intensive or traditional). The dependent variable was the score on the questionnaires.

Specific questions this study sought to answer were:

1) Is the intensive instructional environment an effective inservice model for computer application instruction when compared to the traditional instructional environment?

2) Is there a relationship between learning styles and success in specific instructional environments?

For this study, a 15-hour inservice module on classroom technology applications was designed and presented in two instructional environments - traditional and intensive. Research indicated the module design should include the following elements: provisions for hands-on practice time and active
involvement, technology taught in context, modeling of changes in teacher practice necessary to integrate technology, inclusion of a component for transfer of skills to the classroom, promotion of collegiality and cooperation, demonstrations of and support for a variety of learning and teaching styles, incorporation of adult learning pedagogy, and opportunities for reflection.

The module contained four segments. The first three segments were four hour instructional sessions in which educational applications were introduced and practiced. The fourth segment was a three hour joint sharing session in which participants presented examples of work they created with students based on skills learned in the instructional sessions.

The three instructional sessions were offered in two instructional environments. One environment was the traditional inservice workshop format: each segment was offered in separate after school sessions spaced two weeks apart. The other environment was an intensive format: the three segments were offered in a weekend workshop on Friday evening, Saturday morning, and Saturday afternoon.

The fourth sharing segment including both groups was offered one week after the final traditional session, which was five weeks after the intensive session.

Data were obtained through pre- and post- questionnaires, reflection surveys at the end of each session, comments made during the project and final presentations by the participants.
The null hypotheses were: (1) participants in both groups will show no differences in their growth in use of computer applications, and (2) participants in both groups will show no differences in relationships between individual

Participants

Participants were volunteers from the professional staff of a public school district in the southwestern United States. Recently the district had experienced a rapid growth rate of over four percent a year. The student population for the elementary district was approximately 9,500 students with a 62% ethnic minority student population. The number of teachers in the district was 465. There were 21 participants in the study, 18 females and 3 males. They received one professional growth credit from the district for their participation. Fifteen of the participants were elementary classroom teachers, four were library media specialists, one was a music teacher, and one was a district coordinator.

The participants were offered a choice of formats. Ten of the participants volunteered for the traditional format, eleven volunteered for the intensive format. Of the 21 participants, 19 successfully completed all four segments. Two of the participants were unable to attend one of the segments. Data from the 19 participants are used for tabulating statistics: resulting in 8 for the traditional format, 11 in the intensive format.

The 19 participants' teaching experience ranges from 1.5 years to 29 years with the average being 13.9 years. Of the 19 participants, 16 had prior
technology training. However, the three who recorded no prior training all listed a minimum of three years experience with computers.

Materials

Sessions were conducted in a district training room equipped with 15 Power Mac computers (5200 series) and a computer presentation station with a large screen projection device. Each participant had exclusive access to a machine, and a large screen display was available for the instructor and participants to use for demonstrations. The school district maintained the computers and had installed MicrosoftWorks 4.0. Broderbund Software lent copies of KidPix for this project and Roger Wagner Publishing sent a "Workshop in a Box" with supplementary materials and a copy of HyperStudio 3.1. Each participant also had access to a 5200 series Power Mac computer with these programs back in their classroom.

The Myers-Briggs Type Indicator or MBTI (Myers, 1978) was used to identify learning styles for this study because of the literature that supports its use to identify preferences (McCrae & Costa, 1989). It is based on Carl Jung's ideas about psychological types as a way of explaining some of the apparently random differences in people's behavior and is one way of identifying learning styles. It was published in 1962 after a 20-year development period and describes individuals as one of 16 types based on preferences for: extraversion or introversion, sensing or intuition, thinking or feeling, and judging or perceiving. Individuals are identified using a four letter combination such as INFP (Introvert, iNtuitor, Feeler, Perceiver).
Pre- and post-questionnaires (Appendix A, B) were developed by the researcher to obtain profile information on the participants, and record their observations and comments. The questionnaires also contained items related to previous classroom computer use with students. Additional items on personal use of software applications and use of applications with students were scored using a Likert type scale with lower numbers indicating disagreement, no use or little instruction, and higher numbers indicating agreement, extensive use, or extensive instruction.

Reflection sheets (Appendix C) at the end of each segment provided information on learning preferences, feedback on the information presented, and room for comments.

For the three instructional segments, hand-outs were provided which gave the participants detailed, step-by-step instructions for constructing a program in the application being presented. The sheets were titled "15 Minute Specials" (Appendix G-K) and were developed by the researcher to allow the participants to create a simple example in a short amount of time. The participants could take these sheets with them to use back in the classroom.

Healthful snacks were also provided at each session to help meet basic human needs as most teachers came right from school for the sessions without an opportunity for a meal. Participants were also provided with computer disks in each session so they could copy and take with them for reference examples of their work and idea lists created during brainstorming sessions.
Procedures

Traditional Instructional Environment

Prior to the first session, participants were mailed a Form G Self-scorable Myers-Briggs Type Indicator (MBTI) along with an instruction sheet (Appendix E). They were directed to complete and score the form and bring it to their first session. The session started with a brief introduction and time to complete the pre-assessment questionnaire and a consent form (Appendix F). Then, an MBTI certified professional spent the first hour discussing their results, answering questions, and guiding them through an exercise to demonstrate how different styles of individuals respond in different manners to the same stimulus.

After a short break, participants were given an overview of the workshop and told about the type of assignment they would need to create with students either individually or with a colleague to bring to the final session. The session then continued with an introduction to MicrosoftWorks 4.0 slide show and KidPix slide show. This part started with a brief discussion of the slide show concept. Participants were then given the “15 Minute Special” handout for construction of a MicrosoftWorks slide show. They were told that they could proceed with the lesson in the style that was most comfortable for them.

The instructional model followed the same sequence in each segment. Teaching was presented in four steps:

first, lecture-demonstration of the steps on the hand-out,
second, guided practice of the steps with the instructor demonstrating as the students followed and implemented the steps on their computers,

third, individual learning in which the student could follow the steps at a personal pace, and

fourth, a cooperative learning approach where students worked in small groups to create a product.

Students could make the choice to skip the first two steps and proceed with individual learning or attend to the steps as they were presented. After the cooperative step, time was taken to view the students' work and provide complimentary feedback on their accomplishments. After a short break, the same procedures were followed for KidPix slide shows.

At the end of the segment, additional samples of slide shows were shown. Time was taken to brainstorm ideas for classroom slide show projects. The instructor recorded these ideas in a word-processing document as topics were suggested. Students were encouraged to copy these ideas onto their disks to take with them. Students were reminded of their assignment for the final session and given time to fill out a reflection sheet regarding their learning for the session.

The second segment was two weeks later. The topics for this segment were spreadsheets and databases. Instructional strategies follow the four previously outlined steps, and the same instructions were repeated to students reminding
them that they could proceed according to the style with which they were the most comfortable.

The spreadsheet activity involved use of a package of M & M's candy to construct a spreadsheet. They were directed to sort and count the M & M's according to color. Students were then provided with the "15 Minute Special" directions to create a spreadsheet. The instructor followed the four steps of the directions as previously outlined. After students constructed their grid and entered their information, they went around the room and entered their information in the other participants' grids. Students were shown how to total the data and construct a chart from the information. Everyone walked around the room and observed the different kinds of charts and was encouraged to pass on complimentary comments. They were then directed to the Mars Candy site on the World Wide Web to compare their data with the candy company data. They were also given an address for an internet site where their class could submit class percentages of each color and compare the data worldwide.

After a short break, the session continued with the database activity. This activity used information on birds to construct a database. Fields for the database included such topics as wingspan, diet and number of eggs. The instructor handed out the "15 Minute Special" with directions to construct a database and followed the four steps as previously outlined. Students were given time to enter data on at least six birds, then they were shown how to sort the information according to different fields and hierarchies.
At the end of this segment, time was spent in the same brainstorming as previously described. Students were again encouraged to copy the information onto their disks and time was given for verbal and written reflection.

The third segment was two weeks later. The topic for this segment was HyperStudio. Instructional strategies followed the four previously outlined steps, and the same instructions were repeated to students reminding them that they could proceed according to the style with which they were the most comfortable. The instructor handed out the "15 Minute Special" for creating a HyperStudio stack and modeled the four previously outlined steps. After students completed their samples, time was allowed to explore each other's stacks and share comments.

At the end of the third segment, time was again spent on brainstorming topics for classroom applications. Students were again encouraged to copy the information onto their disks and time was given for verbal and written reflection.

**Intensive Instructional Environment**

The intensive instructional format followed the same steps and topics as listed above. The only difference was the time the sessions were offered. The first segment was on a Friday evening from 4-8:00 p.m. The same MBTI certified professional was there to discuss results, answer questions, and guide participants through the same exercise on learning styles. The second segment was on Saturday morning from 8-12:00. A free lunch was provided from 12-12:30, and the third segment was from 12:30 -4:30.
The final joint segment for both groups met one week after the third session for the first group, and five weeks after the third session for the second group. Scheduling difficulties prevented a two week option. This segment took place in the school district boardroom, and district administrators were invited as guests to view the participants' work. A demonstration center was set-up with a Power Mac 5400 and a projection device similar to the one used in the instructional segments. Participants took turns explaining and sharing their work. At the end of the session, a final presentation was given by the instructor that reviewed student progress and pointed to new directions in their professional growth. Time was given for socializing, reflection, and post-assessment questionnaires.
CHAPTER 4

Results

The study proposed to determine if any measurable differences could be detected in teachers' growth in ability to use computer applications between teachers who learn in intensive course environments versus teachers who learn in traditional (spaced) course environments. This study also sought to determine if there is any relationship between learning styles and success in these specific environments.

For purposes of this study, the traditional course environment was defined as three late afternoon, four-hour sessions spaced two weeks apart, and a final three hour sharing session. The intensive course environment was a weekend workshop that met four hours on Friday evening, four hours Saturday morning and four hours in the afternoon. A joint three-hour sharing session was held five weeks later. The independent variable for this study was the instructional environment (traditional or intensive). The dependent variable was the score on the questionnaires.

Specific questions this study sought to answer were:

1) Is the intensive instructional environment an effective inservice model for computer application instruction when compared to the traditional (spaced) environment?
2) Is there any relationship between learning styles and success in specific instructional environments?

First Research Question

For the first question, personal growth scores and t-tests for independent samples were used in comparing the two groups - traditional and intensive - on the same variables to answer the research question. Data were obtained by calculating the difference between an individual's pre- and post- scores of corresponding items on the questionnaires. The scores on both pre-and post-questionnaires were self reported, and the difference between an individual's score was used as a growth score for each item. Participants' growth scores from pre- to post-study were examined in two areas.

The first area was the participants' personal growth in confidence in the use of the following applications: MicrosoftWorks slide show, KidPix slide show, spreadsheet, database, and HyperStudio. To calculate the growth score for MicrosoftWorks slide show, item #34 on the pre-questionnaire was subtracted from item #39 on the post-questionnaire. For KidPix slide show, item #35 on the pre- was subtracted from item #41 on the post-; for spreadsheets, item #32 pre- and #35 post-; for database, item #33 pre- and #37 post-; and for HyperStudio, item #36 pre and #43 post were used.

The second area was the participants' use of the aforementioned applications with students. To calculate the growth score for MicrosoftWorks slide show, item #42 on the pre-questionnaire was subtracted from item #40 on the post-questionnaire. For KidPix slide show, item #43 on the pre- was
subtracted from item #42 on the post-; for spreadsheets, item #40 pre- and #36
post-; for database, item #41 pre- and #38 post-; and for HyperStudio, item #44 
pre- and #44 post- were used.

Personal growth scores are presented in Table 1. Both groups showed 
comparable growth in all areas. The mean scores were all within one-half 
point, except in the area of KidPix slide shows where the traditional group 
showed greater growth.

Table 1

<table>
<thead>
<tr>
<th>Personal Growth Scores in the Use of Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Group, n=8</td>
</tr>
<tr>
<td>Mean Pre-</td>
</tr>
<tr>
<td>MSWorks SlideShow</td>
</tr>
<tr>
<td>KidPix SlideShow</td>
</tr>
<tr>
<td>Spreadsheet</td>
</tr>
<tr>
<td>Database</td>
</tr>
<tr>
<td>HyperStudio</td>
</tr>
<tr>
<td>Intensive Group, n=11</td>
</tr>
<tr>
<td>Mean Pre-</td>
</tr>
<tr>
<td>MSWorks SlideShow</td>
</tr>
<tr>
<td>KidPix SlideShow</td>
</tr>
<tr>
<td>Spreadsheet</td>
</tr>
<tr>
<td>Database</td>
</tr>
<tr>
<td>HyperStudio</td>
</tr>
</tbody>
</table>

The t-test results for personal growth are presented in Table 2. Due to the 
small sample size, a conservative alpha level of .01 was used for all analyses. 
Although initial growth scores showed some differences between group scores, 
t-test results revealed that there was not a statistically significant difference on 
personal growth scores between traditional and intensive groups in any of the
areas examined. Scores on personal growth ranged from $t(17) = -.94$, $p > .30$ to $t(17) = 1.05$, $p > .30$. Levene’s Test for Equality of Variances showed that the assumption of homogeneity of variance was met in all areas.

### Table 2

**T-tests of Personal Growth in the Use of Applications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Traditional Group (n)</th>
<th>Intensive Group (n)</th>
<th>df</th>
<th>t-test</th>
<th>signif. p value</th>
<th>homogeneity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MicrosoftWorks Slide Show</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>.07</td>
<td>.947</td>
<td>.830</td>
</tr>
<tr>
<td>KidPix Slide Show</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>1.05</td>
<td>.308</td>
<td>.551</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>-.94</td>
<td>.362</td>
<td>.432</td>
</tr>
<tr>
<td>Database</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>-.06</td>
<td>.951</td>
<td>.664</td>
</tr>
<tr>
<td>HyperStudio</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>-.18</td>
<td>.856</td>
<td>.705</td>
</tr>
</tbody>
</table>

In the area of participants’ use of the applications with students, growth scores are presented in Table 3. Both groups showed growth, however the intensive group showed a consistently higher growth in four of the five areas examined. In the use of HyperStudio with students, the intensive group showed a marked increase in growth. Several of the participants skipped or chose not to respond to some of the items on the questionnaires, thus the discrepancy in the number (n).
In the area of participants' use of the applications with students, t-tests for independent samples were also used. A conservative alpha level of .01 was maintained for testing. The t-test results for growth in the use of applications with students are presented in Table 4. Again, the initial growth scores showed some differences between groups. However, t-test results indicated that there was not a statistically significant difference in growth scores between the traditional and intensive groups regarding the use of applications with students. Scores ranged from $t(17) = -1.69, p > .10$ to $t(17) = -.05, p > .90$. Levene's Test for Equality of Variances showed that the assumption of homogeneity was met in four out of the five areas. The area of spreadsheets did not meet the

<table>
<thead>
<tr>
<th></th>
<th>MSWorks</th>
<th>KidPix</th>
<th>Spreadsheet</th>
<th>Database</th>
<th>HyperStudio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=8)</td>
<td>(n=7)</td>
<td>(n=8)</td>
<td>(n=9)</td>
<td>(n=8)</td>
</tr>
<tr>
<td>Mean Pre-</td>
<td>1.25</td>
<td>1.29</td>
<td>1.25</td>
<td>1.25</td>
<td>1.12</td>
</tr>
<tr>
<td>Mean Post-</td>
<td>2.75</td>
<td>3.15</td>
<td>1.75</td>
<td>2.37</td>
<td>1.62</td>
</tr>
<tr>
<td>Mean Growth</td>
<td>1.5</td>
<td>1.86</td>
<td>.5</td>
<td>1.12</td>
<td>.5</td>
</tr>
<tr>
<td>SD</td>
<td>1.69</td>
<td>2.11</td>
<td>1.06</td>
<td>1.55</td>
<td>1.41</td>
</tr>
<tr>
<td>Mean Pre- Intensive</td>
<td>1.55</td>
<td>1.70</td>
<td>1.20</td>
<td>1.22</td>
<td>1.18</td>
</tr>
<tr>
<td>Mean Post-</td>
<td>3.10</td>
<td>3.70</td>
<td>2.50</td>
<td>2.66</td>
<td>3.18</td>
</tr>
<tr>
<td>Mean Growth</td>
<td>1.55</td>
<td>2.0</td>
<td>1.3</td>
<td>1.44</td>
<td>2.0</td>
</tr>
<tr>
<td>SD</td>
<td>1.97</td>
<td>1.83</td>
<td>1.83</td>
<td>1.74</td>
<td>2.19</td>
</tr>
</tbody>
</table>

Table 3

Growth Scores in the Use of the Applications with Students
Table 4

T-tests for the Use of Applications With Students

<table>
<thead>
<tr>
<th>Item</th>
<th>Traditional Group (n)</th>
<th>Intensive Group (n)</th>
<th>df</th>
<th>t-test t-value</th>
<th>signif. p value</th>
<th>homogeneity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MicrosoftWorks Slide Show</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>-.05</td>
<td>.959</td>
<td>.599</td>
</tr>
<tr>
<td>KidPix Slide Show</td>
<td>7</td>
<td>10</td>
<td>15</td>
<td>-.15</td>
<td>.884</td>
<td>.367</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td>8</td>
<td>10</td>
<td>16</td>
<td>-1.16</td>
<td>.265</td>
<td>.039</td>
</tr>
<tr>
<td>Database</td>
<td>8</td>
<td>9</td>
<td>15</td>
<td>-.40</td>
<td>.697</td>
<td>.216</td>
</tr>
<tr>
<td>HyperStudio</td>
<td>8</td>
<td>11</td>
<td>17</td>
<td>-1.69</td>
<td>.109</td>
<td>.075</td>
</tr>
</tbody>
</table>

assumption of homogeneity. Very few of the participants in the traditional group reported using spreadsheets with students. Consequently, the variances between the pooled scores of that group and the intensive group showed a greater disparity rather than homogeneity. Thus results in that area are suspect. Several of the participants skipped or chose not to respond to some of the items on the questionnaires, thus the discrepancy in the number (n).

Statistical results show that there were no statistically significant differences between the traditional and intensive groups either in personal growth or growth in the use of applications with students, thus the null hypothesis is not rejected. According to results from this study, the intensive instructional
environment is an effective inservice model for computer applications when compared to the traditionally spaced environment.

Second Research Question

Due to the small sample size, not enough data was available to perform t-tests to answer the second question. However, descriptive statistics provide some useful information on learning styles of participants in this study.

For purposes of this analysis, the participants were compared with the general school population of students and adults based on the Myers-Briggs (MBTI) description of their learning styles (Lawrence, 1987). The comparisons were based on the first two identifying letters of the individual’s type score. The first letter is either I - Introversion or E - Extraversion. The second letter is either S - Sensing, or N - Intuiting. The number of participants in the four areas of the MBTI are shown in Table 5 along with a comparison of the proportion of the participants to the proportion of types found in the general school population, based on composites of Myers’ data on students and adults (Lawrence, 1987). In the general school population, .30 of persons are Introverts and .70 are Extraverts. Of the participants in this study, .63 of the traditional group and .73 of the intensive group were Introverts, a noticeable departure from the proportion of .30 found in the general population proportions. Similarly, .38 of the traditional and .27 of the intensive group were Extraverts, another noticeable departure from the proportion of .70 found in the general population. In the category of Sensing, .63 of the traditional group and .64 of the intensive were
Table 5

Personality Types of Participants

<table>
<thead>
<tr>
<th>MBTI Type</th>
<th>General Population Proportion</th>
<th>Number in Traditional Inservice</th>
<th>Traditional Proportion</th>
<th>Number in Intensive Inservice</th>
<th>Intensive Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introversion</td>
<td>.30</td>
<td>5</td>
<td>.63</td>
<td>8</td>
<td>.73</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.70</td>
<td>3</td>
<td>.38</td>
<td>3</td>
<td>.27</td>
</tr>
<tr>
<td>Sensing</td>
<td>.70</td>
<td>5</td>
<td>.63</td>
<td>7</td>
<td>.64</td>
</tr>
<tr>
<td>iNtuiting</td>
<td>.30</td>
<td>3</td>
<td>.38</td>
<td>4</td>
<td>.36</td>
</tr>
</tbody>
</table>

more closely aligned with the .70 Sensing found in the general population. The final category of iNtuiting showed .38 in the traditional group and .36 in the intensive group, closely comparable to .30 in the general population.

Although all participants showed a measure of success in the study as evidenced by their growth scores, not enough data were available to conclusively establish a relationship between learning styles and success in either environment.

Limitations

This was a one-time study conducted during a six-week period in one school district. The information was given from this time period and did not include any longitudinal data. The participants in the study were not randomly selected from the entire school district teacher population but were volunteers. The participants were not randomly placed in instructional settings, rather they
were offered a choice of formats. The researcher was the instructor for both formats, and the study was also limited by the small sample size.
CHAPTER 5

Conclusions

Educating teachers in the use of technology is a key issue for effective use of technology in the classroom (U.S. Congress, 1995). Developing successful models of inservice education that focus on helping teachers learn how to integrate technology in the curriculum will ultimately reap benefits for the students. Results of this study indicate that intensive models of inservice education are as effective as traditional models in both personal growth with technology applications and growth in the use of the applications with students. This finding supports research that indicates that there is no one best model or design for inservice education (Harris, 1989; Bailey & Lumley, 1994; Goldberg & Richards, 1995). This finding also supports research on adult learners who are eager to make rapid progress and prefer an intensive course of study rather than the traditional method (Eckart, 1995). Some teachers may prefer and be more motivated to attend an intensive course on technology applications. By offering a choice of formats, more options can be offered to teachers to introduce and educate them about classroom technology applications. Further research with a larger sample size is recommended to provide more data on effective formats for inservice technology education.

Participant comments that supported the traditional method included: "It's a good format for those of us who don't like too concentrated a dose of info;" "Two
full days would be too demanding for me, mentally and physically;” and “I like taking my time, savoring the lesson, reflecting on what I’ve learned.”

Participant comments that supported use of the intensive method included: “Some (learners) like more/faster, (and) other(s) prefer less/slower;” “Organization of time is easier if a block. Several weeks of commitment is more likely to have spotty attendance;” “It gave me enough to explore and consider in a time-frame that fit in with my professional and personal lives;” and “Some like a lengthy block of time for hands-on.” All respondents in both environments indicated that they believed the format they attended was an effective format for learning classroom technology applications. Both groups showed growth in personal use of applications and use of the applications with students. Preliminary data indicated that the intensive group showed more growth in using the applications with the students. However, due to the small sample size, the preliminary data was not strong enough to warrant a statistical significance. Further research with a larger sample size might indicate whether or not the intensive method results in more growth in the use of the applications with students.

The inclusion of the element on learning styles yielded a mixed response. When asked if knowledge of their learning style affected the knowledge they gained from the course, seven of the participants replied “no”, nine replied “yes” and three indicated a possible effect. Some of their comments included: “No, because I never stop to think about it;” “Yes, when given choices of how the lesson was to be taught, I selected that with which I was the most comfortable;”
"Maybe providing different styles let me gain more knowledge;" and "I think you learn, if you want, no matter what the format and learning style." One could speculate that providing a choice of format (traditional or intensive) addresses learning style needs and leads to class success. These comments suggest that further research on teachers' learning styles and technology education is warranted.

Other results showed that the proportion of preferences for Introversion and Extraversion in this study of elementary teachers was the reverse of the proportions found in the general school population of students and adults. Approximately two thirds of the group preferred Introversion and one third preferred Extraversion. According to Myers (1980) people who prefer introversion tend to focus on the inner world of concepts and ideas. They do their best work inside their heads and learn best by reflection and mental processes. People who prefer extraversion tend to focus on the outer world of people and external events. They do their best work externally and learn best by active involvement and discussion.

A study done by Rude-Parkins, Baugh and Petrosko (1993) noted significantly more INTJ types among the high school teachers who participated in technology training when compared to the general population. Profiles of the INTJ type include logical, decisive innovators of ideas who are serious, highly independent, and concerned with organization (Lawrence, 1987). According to Rude-Parkins, Baugh and Petrosko, (1993), the INTJ type will work tirelessly to use an innovation, such as technology, but may not be successful at getting
others to use it. Their findings when coupled with the findings of a higher proportion of Introversion types in this study, suggest that further research is needed on technology education and learning styles among teachers to gather more data on the types of teachers who choose to participate, or not participate, in technology education for the classroom.

The implication of this study is that successful technology inservice education models are those that meet the individual learner's needs, and focus on supporting teachers as they learn technology rather than merely teaching the technology. Based on the results of this study, the intensive inservice model is at least as good as the traditional model and should be considered as an option when planning a variety of models to meet the various individual needs of the teachers. As one of the participants noted, "Learners come in all sizes and styles. Teachers no less than students learn in various ways." If one of our goals is to connect our students with technology, then teachers need to be recognized as key elements in providing student connections to technology. In order for technology to reach the students, teachers should be provided with a variety of effective inservice technology education models that address their various needs and styles so they can successfully integrate technology into the classroom curriculum.
APPENDIX A
(reformatted for thesis document guidelines)

Pre-Assessment Questionnaire

Section One

1. Number of years teaching ____________ 2. Current grade level or job_________
3. Number of years experience with computers (explain) ____________________________
4. Type of computer(s) in your classroom ________________________________
5. Length of time you have been using computers in the classroom ____________
6. Average number of hours students in your room are using the computer (weekly basis) ______
7. Type of computer in your home (if applicable) ______________________
8. How often do you use your home computer? (if applicable)_____________________
9. Please list and briefly describe any previous technology training you have received (inservices, workshops, classes, etc.)

10. Year and school from which you received your teaching degree (BA) ______________
11. How many computer courses were included in your under-grad program ____________
12. Year and school from which you received your Master’s degree___________________
13. How many computer courses were included in your master’s program _____________

14. Please list your identified learning style_____________________________________
15. Type of inservice instruction you chose
   _______Format 1 (Thursdays) _______Format 2 (Weekend Workshop)
16. Reasons for your choice:
   a. I prefer that format of instruction
   b. Convenience
   c. Other (please explain)
Section Two
The following scale is intended to estimate your attitude of computers/software in your classroom.
Circle the number that best reflects your response to the statements.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. I am confident of my ability to teach using computers.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>18. I can plan instruction that incorporates technology.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>19. Time for learning new technology is a problem for me.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>20. I currently have on site technology support.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>21. I enjoy working with computers.</td>
<td>1 2 3 4 5 6</td>
</tr>
</tbody>
</table>

Please rate the following statements to reflect your current classroom use.

<table>
<thead>
<tr>
<th>Never</th>
<th>Extensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>22. I use software to introduce new concepts when teaching</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>23. I use software to reinforce concepts I have already taught.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>24. I mostly use software as a reward for work in other areas.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>25. I mostly use software to create multimedia programs.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>26. I mostly use software to help teach students about computers.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>27. I choose software that can be used to prepare demonstrations.</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>28. I choose software that can be used to individualize instruction for students with varied learning styles.</td>
<td>1 2 3 4 5 6</td>
</tr>
</tbody>
</table>

Section Three
A. How knowledgeable would you rate yourself in technology with respect to the following statements.

<table>
<thead>
<tr>
<th>No Experience</th>
<th>Extensive Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. Saving work in a program</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>30. Saving work to a disk</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>31. Making changes in word processing programs</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>32. Using spreadsheet programs</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>33. Using database programs</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>34. Making slide shows in Microsoft Works</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>35. Making slide shows in KidPix</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>36. Using HyperStudio</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>37. Using e-mail</td>
<td>1 2 3 4 5 6</td>
</tr>
</tbody>
</table>

B. In general, how would you rate the instruction you have given your students with respect to the following statements.

<table>
<thead>
<tr>
<th>No Instruction</th>
<th>Extensive Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>38. Saving work in a program</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>39. Saving work to a disk</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>40. Using spreadsheet programs</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>41. Using database programs</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>42. Making slide shows in Microsoft Works</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>43. Making slide shows in KidPix</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>44. Using HyperStudio</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>45. Using e-mail</td>
<td>1 2 3 4 5 6</td>
</tr>
</tbody>
</table>
APPENDIX B
(reformatted for thesis guidelines)

Post-Assessment Questionnaire

Section One

1. Please list your identified learning style

2. Type of inservice instruction you chose
   _______Format 1 (Thursdays)       _______Format 2 (Weekend Workshop)

3. Do you think the format supported your learning style? Why or why not.

4. Do you think knowledge of your learning style affected the knowledge you gained from this class? Why or why not.

5. What do you consider to be key factors in helping teachers integrate technology in the classroom?

6. What do you think can be done to make this inservice instruction in technology better?

7. What can be done to help you use technology more successfully in your classroom?

8. Please comment on the content for this instruction (e.g. too fast, too slow, too much, too little, etc.)

9. Additional comments (highs, lows, difficulties, successes, revelations, disappointments, reflections, etc.)

Section Two

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The following scale is intended to estimate your attitude of computers/software in your classroom. Circle the number that best reflects your response to the statements.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17. I am confident of my ability to teach using computers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>18. I can plan instruction that incorporates technology.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>21. I enjoy working with computers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>22. I use software to introduce new concepts when teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>23. I mostly use software to reinforce concepts I have already taught.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>24. I mostly use software as a reward for work in other areas.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>25. I now use software to create multimedia programs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>26. I mostly use software to help teach students about computers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>27. I choose software that can be used to prepare demonstrations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>28. I choose software that can be used to individualize instruction for students with varied learning styles.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Section Three
Please respond to the following statements using the number that best describes the current level of computer use in your classroom.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>29. I know how to save my work</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>30. My students know how to save their work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>31. I know how to save my work to a disk.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>32. My students know how to save their work to a disk.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>33. I know how to use and make changes to my word-processing program.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>34. My students know how to use and change word-processing programs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>35. I know how to use a spreadsheet program.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>36. I have used a spreadsheet program with my students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>37. I know how to construct a database program.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>38. I have used a database program with my students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>39. I know how to make a slide show in MicrosoftWorks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>40. I have made a slide show in MicrosoftWorks with my students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>41. I know how to create a slide show in KidPix.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>42. I have helped my students create a slide show in KidPix.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>43. I know how to use HyperStudio.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>44. I have helped my students create a program in HyperStudio.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>45. I have used e-mail to network with others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Please answer the following questions based on your experience in the workshop.
46. Do you believe your workshop was an effective format for learning classroom technology applications?
   _____ yes _____ no
   Why or why not?

47. Do you believe your workshop was an effective format for all teachers to learn classroom technology applications?
   _____ yes _____ no
   Why or why not?

48. Do you believe your workshop was an effective format for some teachers to learn classroom technology applications?
   _____ yes _____ no
   Why or why not?

49. Do you believe a variety of workshop formats should be offered to help teachers learn classroom technology applications?
   _____ yes _____ no
   Why or why not?

Please answer the following questions based on your point of view.

50. Two different instructional formats were used for this project. If future classes were offered "after school", which format would you choose?
   _____ Format 1, 4 hour sessions spread out over several weeks
   _____ Format 2, 2 days (back to back) of intensive instruction
   Why?

51. If you were given time off from your classroom, which format would you choose?
   _____ Format 1, 4 hour sessions spread out over several weeks
   _____ Format 2, 2 days (back to back) of intensive instruction
   Why?

52. Which format do you believe is the most effective for instructing teachers in classroom technology applications?
   _____ Format 1, 4 hour sessions spread out over several weeks
   _____ Format 2, 2 days (back to back) of intensive instruction
   Why?

Please use the back side for any additional comments concerning this workshop.

*Thank you*
APPENDIX C

Slide Show Reflection
(reformatted for thesis guidelines)

A. For this segment, please rank the presentation style in order of your preference (1st, 2nd, 3rd, 4th)

1. Lecture-Demonstration
2. Guided Practice
3. Small Group Work
4. Individual Learning

B. Please respond to the following statements using the number that best describes your preference in this learning situation.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not Helpful</th>
<th>Somewhat Helpful</th>
<th>Helpful</th>
<th>Very Helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Listening to lecture-demonstration</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Participating in guided practice</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. Working in small groups</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. Working individually</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. Use of instructor for answers/reference</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. Use of peers for answers/reference</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. Use of instructor for feedback</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. Use of peers for feedback</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

C. Please respond to the following statements using the number that best describes your preference in this learning situation.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Very Easy</th>
<th>Easy</th>
<th>Challenging</th>
<th>Very Challenging</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Following the direction sheet for MicrosoftWorks</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>14. Learning to create a MicrosoftWorks Slide Show</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>15. Following the direction sheet for KidPix2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. Learning to create a KidPix2 slide show</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

D. Additional Comments
APPENDIX D
SOFTWARE PERMISSION

21 January 1997

Karen Grove
Graduate Student UNLV
3147 Key Largo Dr. #203
Las Vegas, NV 89120

Dear Karen:

Enclosed is the requested software for your teacher training. I will be forwarding copies of Spring
Software for Education Catalog, as it becomes available. I would appreciate your distributing them
to the teachers in your project.

Please let me know how it goes.

Sincerely,

Mark Clark
Administrative Assistant
Education Sales and Marketing

PS I will be looking for the software to be returned by the first of April.
Dear Colleague,

Does any of this sound familiar? A enjoys change and innovation; B hates change. A detests listening to long lectures; B enjoys them. A likes spontaneous activities; B needs to plan all activities. In some relationships, this could cause major stresses, but if A and B know and appreciate their differences, they can work together and grow.

Appreciating differences is what the Myers-Briggs Type Indicator (MBTI) is all about. Just as you have a preferred hand to write with (unless you are one of those rare folks who are ambidextrous), so you most probably have preferred ways of energizing, inputting data, making decisions, and functioning in the outside world. Because of these differences, you most probably have a preferred mode of learning. Think about the teachers who have touched you in a positive way. Might they have been appealing to your preferred learning mode and your preferred way of interacting with people?

In preparation for the workshop, Karen Grove and I are asking that you complete the attached MBTI, score it, and bring it with you to the first workshop. The MBTI is an instrument that helps identify your personality type and with that, your preferred learning mode. Some research indicates that unless teachers are helped to understand their own learning styles and the existence of diversity in learning styles among their students, they may well be designing curricula and teaching solely to their dominant preferred mode.

Think of the MBTI as a mirror, not a box into which you are put. When you answer the questions, do so for your preference - in the best of all possible worlds - not the way you think your friends, co-workers or supervisor might expect you to answer. When you complete the instrument and score it, read the description of the type you reported to be. If it does not feel comfortable or "right", read the ones on each side of yours and see if either of those describes you better. We will spend a brief time talking about its application for you professionally and personally. Because I love innovation and fun in the classroom, part of our time together will be an activity that will demonstrate for you the theory of learning styles diversity.

I look forward to our time together. If you have any questions prior to the workshop, feel free to contact me.

Cordially,

Teresa Delgadillo Harrison

e-mail: teresah@nevada.edu
FAX: 702 436-9460
School: 702 895-1432
APPENDIX F

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Project Title: Classroom Technology Applications

Researcher: Karen J. Grove
Graduate Student
University of Nevada, Las Vegas
Department of Instructional & Curricular Studies

Purpose: You are being asked to participate in a research study which will compare two instructional environments based on a fifteen hour technology instruction module focusing on classroom applications for teachers.

Procedure: This study will employ an experimental research design with the researcher in the role of participant-observer. Data will be collected through questionnaires, written reflections, final projects and informal interviews.

Benefits: This research will add to the body of knowledge on effective inservice models for technology application instruction and learning styles in staff development models. Research results will benefit others in planning for effective staff development programs for classroom applications of technology.

Conditions: Information collected in this study is confidential and your real name will not be used. Length of involvement in the study is from Feb. 6 through March 13, 1997. Compensation will be one professional growth credit from Yuma School District One upon successful completion of the project.

Your participation in the study is entirely voluntary and you are free to withdraw your consent at any time. If you have any questions during your association with the research study, before or after its completion, please feel free to ask for further information from the project researcher, Karen J. Grove, at 702-898-9342 or grove@nevada.edu.

For questions about the rights of research subjects, contact the Office of Sponsored Programs at the University of Nevada, Las Vegas, 702-895-1357.

Information gathered during this study may be used to inform other professionals through conferences, journal articles, or books. You will be given a signed copy of this agreement to keep for your personal files.

YOUR SIGNATURE BELOW WILL INDICATE THAT YOU HAVE DECIDED TO VOLUNTEER AS A RESEARCH PARTICIPANT AND THAT YOU HAVE READ THE INFORMATION PROVIDED ABOVE.

_________________________________________  ____________________________
Signature of Participant                        Date

_________________________________________  ____________________________
Signature of Researcher                        Date
Grove's 15 Minute Special
Creating a MicrosoftWorks Slide Show
(Adapted from Tom Snyder Productions' Creating A Claris Slide Show, permission granted for educational use.)

The following walkthrough is designed to help you create a 3 page slide show that can run on your classroom computer at the beginning of parents' night.

- Create a new document using MicrosoftWorks Draw.
- On the ruler, select the "Master Slide Icon".
- Open the Format Menu, choose "Master Slide Attributes".
- Click on background color & choose one. Click OK.
- On the ruler - select the single Slide Icon.
- At the middle bottom of the page, use the arrow to size down to 50%.
- Use the Draw tools on the side, click the text tool (A).
  * Draw a box in the middle of the screen for your text.
  * Use the arrow at the top of the page to select 48 pt. text.
  * Select the centering icon for text on the ruler.
  * Type "Welcome Parents"
  * Select the arrow in the Draw tools to move & center the text box.
- At the middle bottom of the screen, click the right arrow- a new page appears.
- Use the draw tools on the side, click the text tool (A)
  * Draw a box in the middle of the screen for your text.
  * Text should still be at 48 pt. (Select if necessary)
  * Select the centering icon for text.
  * Type "Please find your child's seat." Use arrow tool to center.
- At the bottom middle of the screen, click right arrow, a new page appears.
- Use the draw tools on the side, click the text tool (A)
  * Draw a box in the middle of the screen for your text.
  * Select centering icon for text.
  * Type "We're glad you came!" Use arrow tool to center.
- From Format Menu, choose "Define Slide Show"
  * Click in box by "Advance automatically after 3 seconds. Click OK
- From View Menu, choose "Slide Show" - Watch and enjoy your work!!
  * From Format Menu, choose "Define Slide Show".
  * Click in box by loop continuously, click OK
  * From View menu, choose "Slide Show" - now see what happens! Click escape key (esc) to stop.

Congratulations - you've done a slide show!!
Grove's 15 Minute Special
Creating a KidPix2 Slide Show

The following walkthrough is designed to help you create a KidPix slide show while working in small groups. We will work in groups of 3.

• Double click on the hard drive box.
• Double click on the KidPix folder, double click on the KidPix smiling icon.
• In a small group, plan your 3 slides. Each person can draw one on the same computer.

Draw your slides.
• Design a title page (Give your group a name, "_____’s Slide Show")
  Use "Type Text" under Goodies to type.
  Save as "Title 1" when done.
• Design page one (Perhaps draw a school. “This is my school.”)
  Save as “Page 2” or your name when done.
• Design page two (Perhaps draw your teacher. “This is my teacher.”)
  Save as “Page 3” or your name when done.

• Assemble your slide show.
  * Under Switcheroo, choose slide show.
  You will see a series of “moving vans”. Each van has 3 little boxes on the bed of the truck.
  * Click on the first little box on the moving van (with the tiny square TV screen)
    A field will open up with “picture choices”. Highlight your “Title 1”, click select.
  * Click on the second little box with the musical note. Pick a sound to go along with your title. (Click on a sound, choose preview to see what it sounds like, click “select” when you find the one you want.)
  * Click on the last little box to choose a transition for your slide. (Click on a box, choose preview to see what it looks like, click “select” when you decide.)
  * Slide 1 is done. Follow the same procedures in the next vans for slides 2 & 3.
  If you make a mistake, at the bottom of the screen are a series of 4 icons.
  The first one is the “Undo man” who undoes the last step.
  The second one is the stick of dynamite that “blows up” and erases your boo-boo.
  NOTE: in your classroom, to get more “moving vans” use the arrow keys in the lower right corner.

• Watch your slide show.
  * At the bottom of the screen are a series of 4 icons. The third one will show your slide show through one time. Click it and see what happens.
  * The fourth icon will run your slide show in a continuous loop until you double click the mouse. Try it.

• Save your slide show.
  * If you want to save you slide show, while you are still in the “moving van” screen, under File, choose “Save”
    1. Give your slide show a name.
    2. Click the “Stand Alone Slide Show“ button
    3. Click the “Desktop“ button, scroll to & highlight the disk you want to save it on
    4. Click on “Save“

Congratulations - you’ve created a KidPix Slide Show!
Grove's 15 Minute Special
Creating a Simple Addition Spreadsheet
(reformatted for thesis guidelines)

This exercise will help you create a simple spreadsheet using the addition function. We will use M & M's to generate data for the spreadsheet.

Double click on the hard drive box. Double click on Microsoft Works. Double click on the spreadsheet icon.

• When working with spreadsheets, please note that when data is typed for entry it shows on the top of the spreadsheet. It does not appear in the cells until you select the check mark or click the mouse.

1. Prepare the grid

• Click in cell A1, type "M & M's Data Sheet" (click the check mark or next cell)
• Click in cell A2, type "Name" click the check mark, or the next cell
• Click in cell B2, type "Red" • Click in cell C2, type "yellow"
• Click in cell D2, type "blue" • Click in cell E2, type "green"
• Click in cell F2, type "orange" • Click in cell G2, type "brown"
• Click in cell H2, type "total"

Now, highlight cells B2 through J30 (Click the mouse in B2 & hold till J30)

From Format, choose column width, type 6 in the box, click OK

2. Begin entering data, this is the fun part. Let everyone open their package of M & M's and sort according to color. When they have their totals for each color, have them come up and enter the data in the grid. First select the cell, then enter the data.

For example:

• Click A3, enter you name, click the check mark or next cell
• Click B3, enter your number of reds (e.g. 13), click the check mark or next cell
• Click C3, enter yellows • Click D3, enter blues
• Click E3, enter greens • Click F3, enter oranges
• Click G3 enter browns

• Now it changes..click in H3, click the at the top of the page, highlight the cells to be added (B3 through G3), then click again. It will automatically total the boxes. Cool, Huh?

• You can use the command either before or after you enter the data, it works either way.

3. Grand Totals - after all students have entered their data, in the bottom cell under their names, type "Totals".

• Click in the cell next to the total, under red numbers, click , highlight all the red numbers, hit again, all the reds will be totaled. Repeat the procedure with the other colors.

4. Create a graph - Now you have some grand totals - it's time to see them as a graph!

• First highlight the totals of each color, (Don't highlight the grand total)
• From the Tools Menu select preferences - choose the kind of graph you want (Use the triangle to select a pie chart)
• From the Tools menu, select Create New Chart, and watch what happens.

Congratulations! You've created a spreadsheet.
APPENDIX J

Grove’s 15 Minute Special
Constructing a Database in Microsoft Works
(reformatted for thesis guidelines)

This exercise will help you construct a simple database for North American Birds.

Double click on the hard drive box. Double click on Microsoft Works, Double click on the Database. We are going to create a database on birds with 7 fields of information.

1. Select the fields
   - In the box for Field 1, type: Name (text option)
   - type: Length (in.) (choose Number option)
   - type: Wingspan (in.) (choose number option)
   - type: Weight (oz.) (choose number option)
   - type: Eggs (#) (choose number option)
   - type: Fledgling (days) (choose number option)
   - type: Diet (choose text option)

   * Click Done, click no for format

2. Enter the data
   * Note* Just like a spreadsheet, the information you type shows at the top of the form until you press the “tab” key to enter it.

   * Begin entering your data in the database. A highlight* shows around the box where you are entering data.
     - In Name, type: Bald Eagle
     - In Length, type: 30
     - In Wingspan, type: 96
     - In Weight, type: 160
     - In Eggs, type: 2
     - In Fledgling, type: 77
     - In Diet, type: fish, small mammals, carrion

   * Enter additional information from cards available in the room.
   **Hint**: to change column widths, go into the gray area between the column headings and click on the line till arrows show - then “move” the lines with the mouse.

3. Use your database to sort the information.
   * in the Toolbar at the top, click on the button with “AZ” and an arrow. Then choose some of the different ways to sort your information. Click on the triangle in the “Sort by” box and highlight a different field, watch how your database changes.

   Congratulations, you have just created a database!
This is designed to help you create a 3 card demo stack in HyperStudio.

• Double click on the hard drive box. Double click the HyperStudio folder.
  - Click on the dog (her name is Addy)
  - Click on “Create a new Stack” box. (Click OK after the message.)
  - Click & hold on Tools menu & move them to the side. (Recess! - Time to play!)
• Develop an idea before you start programming!!

1. Choose a background
  - Choose “paint bucket” tool, select a color from Color menu, move the bucket
    over the card & click. (If you don’t like the color, choose “erase background from
    the Edit menu and choose a new one.)

2. Print a Title
  - Choose “add a text item” from the Objects menu. Read message, click OK.
  - Arrange box size and position, click outside of box when done.
  - Choose background color & text color, click on “Style” button,
    -Select print font (top box)
    -Select “Bold” (click in box by it)
    -Select size “36”
    -Select Align (Click on triangle, choose “center”) -Click OK
  - Click on box “Draw scroll bar” to remove it (Box should be blank) -Click OK
  - Type “(Your name)’s Slide Show”, Click outside box when done. If
    necessary, click on “text box” in tool panel, then click your title box and
    re-size the box as necessary.

3. Add a picture (graphic)
  - From Objects menu, choose “add a graphic object”
    -click OK for disk file
    -Scroll down to Education - click Open
    -At top left of picture, choose “box” or “lasso” tool to rope a picture. Click
      OK when selected.
    - Move picture around on card, click beside it when done.
    -Choose frame width & color, click OK.

4. Add another card (From Edit Menu, choose “add a new card”)
  - Give it the same background (paint bucket tool, Color on menu)
  - From Objects, choose “add a graphic item” (disk file, click OK)
    -Scroll down to Science, click Open
    - Choose “lasso” tool (top left), lasso microscope, click OK
    - Move it around, click to the side when you’re done.
  - From Objects, choose “add a text item”, arrange box size to the side
    - Keep background & print color the same, click on “Style”
    - Choose Helvetica Font, change “size” to 18, Change “align” to left
    - Type an inspiring message involving the words: science & microscope
    - click outside text box when done.

5. Add another card (From Edit menu, choose “add new card”)
  - Give it the same background (paint bucket tool, Color on Menu)
* From Objects, choose "add a graphic item" (disk file, click OK)
  - Scroll down to Computer 1, click open
  - Use box tool (top left) to box the picture of person at computer, click OK
  - Arrange picture, re-size if you choose, click beside picture when done
* From Objects, choose "add a text item", arrange text box on page
  - Keep background & print color, Helvetica, bold, "18" size, left align
  - Type an eloquent message about how you love using computers
  - Click outside the box when done

6. Add buttons for navigation (From Move menu, choose "First Card"
  * From Objects Menu, choose "add a button"
    - Type "Science" in name of button
    - Choose background color & 1 of top 4 under "type", click OK
    - Arrange button on screen, click beside when done
    - Under Places to Go, choose "another card"
    - Use arrows to select the microscope card, click OK
    - Under transition, Click OK (or choose a new one!!)
    - Click "play a sound" on Button Actions, choose a sound, Click OK
    - Click "done"
    - Try your button, after you're done - from Move menu, choose "First Card"
  * On first card again, add another button, name this one "Computers", have it connect to the card with the computer graphic, test when done!!
  * Now we need to add "Return buttons" to the back to cards
    - From Move menu, go to microscope card
    - From Objects Menu, choose "add a button"
    - Name this card "Return" and have it go to the title card.
    - When you're finished creating this button, use the "button tool" from the tool bar, click once on the "Return" button to highlight it, then from Edit choose "Copy button", then from Move go to computer card & From Edit choose "Paste button", arrange the button on card

* Test your buttons!

Congratulations! You just completed a HyperStudio Stack
DATE: December 9, 1996

TO: Karen Grove (ICS)
M/S: 5032

FROM: Dr. Fred Preston
Chairman, Social/Behavioral Committee of the Institutional Review Board

RE: Status of Human Subject Protocol entitled:
"Instructional Environments for Technology In-Service Education"
OSP #311s1296-144

This memorandum is official notification that the protocol for the project referenced above has been approved by the Social/Behavioral Committee of the Institutional Review Board. This approval is approved for a period of one year from the date of this notification and work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond a year from the date of this notification, it will be necessary to request an extension.

If you have any questions or require any assistance, please give us a call at 895-1357.

cc: Dr. J. Dixon (ICS-3005)
OSP File
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