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Evaluation of An Adult Education Technology Program

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Approval Page

This applied dissertation was submitted by Iwasan D. Kejawa under the direction of the persons listed below. It was submitted to the Fischler School of Education and Human Services and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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Abstract

Evaluation of an Adult Education Technology Program. Kejawa, Iwasan D., 2007: Applied Dissertation, Nova Southeastern University, Fischler School of Education and Human Services. Databases/Technology/Faculty Development/Action Learning/ Instructional Media (1967 1980)

The purpose of this study was to evaluate the adult education technology program at a chartered alternative adult education center in Florida. The adult education center had a low rate of students passing the Florida Comprehensive Assessment Test (FCAT). This study examined the impact of the use of computer technology in an effort to improve student learning in mathematics, reading, and science. Computers at the institution were used by all students for tutorials to prepare them for the FCAT and to obtain a high school diploma. The research questions for this study were as follows:

1. Is the education technology program of the adult education center achieving the desired school district's goal?
2. Does the curriculum provide the necessary technology skills to students that will enable them to pass the FCAT and obtain a high school diploma?

Research methods for this project were both qualitative and quantitative. The Content-Input-Process-Product (CIPP) model was used for the evaluation of the adult technology program. Fifty students were randomly selected from the pool of students who took the FCAT. The results of the FCAT were examined to determine if the students were achieving desirable scores in accordance with the school district's standard. The results were compared with the previous year FCAT scores to see if there were positive improvements in student scores. Students and faculty were also surveyed by the use of a Likert-type survey. It was found that the education technology program of the adult education center was achieving the desired school district goal and that the curriculum was providing the necessary technology skills to students that would enable them to pass the FCAT and to obtain a high school diploma. With the use of technology at the adult education center, the rate of students passing the FCAT increased nearly 50% over the previous year.

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Chapter 1: Introduction

The field of adult education is comprised of a number of programs, each designed to meet the extensive needs of a specific population, including adult basic education and adult secondary education. Curricula in each of these areas address sophisticated skills in reading, writing, and mathematics as well as more intangible skills that include building self-esteem, team building, and enhancing job readiness. Technology is designed to play a major role in both making educational services available in the aforementioned basic skill areas and transforming the nature of instruction and learning to enable the adult population to be successful.

The school district in this study is situated in the southern coast of Florida and is the 5th largest school district in the United States. Each school district in the state of Florida is subdivided into district areas. These district areas are under the umbrella of a central office. The central office oversees the entire activities of the schools. The school district consists of 150 schools, and about 50 more schools are projected to be built in the next 5 years.

The school selected for this study is the chartered adult education center of the school district where the

researcher is a technology teacher. The center is located in the west area of the school district. The school consists of almost 500 students and about 30 teachers and staff. It is under the guidance of a principal and 3 assistant principals. This particular school is rated as a D school on the school district's grade chart.

The adult technology program of the adult education center can be enumerated as follows:

1. Students, faculty, and staff have immediate access to current technologies, high-speed networks, and support resources to enhance technology use.

2. The programs enable students to use computers, videos, and audio to learn various subjects, including English, mathematics, and science.

3. At the beginning of a course, students take the mastery test, also known as the Fastrack test, to determine their learning path. Students are exempted from the subject module that they have already mastered. Their learning path depends on their areas of need.

4. Students must obtain mastery of 80% of the subject modules. After 80% mastery, they take a test worth 20% of their final grade. The test is in paper-and-pencil format.

5. Students attend a 4-hour session every day where they have access to computers. Two sessions are offered

daily. Session 1 is from 8:00 a.m. to 12:00 p.m. and Session 2 runs from 12:15 p.m. to 4:15 p.m. There is no evening session.

6. Teachers assist students with their studies and answer any questions that the students may have.

7. There are incentives budgeted for students' good behavior, attendance, and talent competitions and for students with the most credit hours each semester.

8. There are parent, staff, and teacher meetings to discuss students' progress and other issues pertaining to the school and the community.

Problem Statement

The adult education center has a low rate of students passing the Florida Comprehensive Assessment Test (FCAT). There was a need for this research because of poor student performance in reading, mathematics, and science in the previous year's FCAT. The study would also determine the effectiveness of the existing computer technology as preparatory tutorial. According to K. Miller (2004), only about 40 out of 250 students who took the FCAT passed the reading and mathematics parts of the examination. The results of the 2004 and the 2005 FCAT can be found in Table 1. The table shows the number of students who passed and failed the FCAT.

Table 1

Results of 2004 and 2005 Florida Comprehensive Assessment Test

Subject	No. tested	No. failed	No. passed	% passed
		2004		
Reading	250	240	10	4.0
Mathematics	250	222	28	11.2
Science	250	238	12	4.8
		2005		
Reading	250	245	5	2.0
Mathematics	250	230	20	8.0
Science	250	235	15	6.0

Of the 250 students who took the FCAT in 2004, 11.2% passed the mathematics portion of the examination compared to 8% in 2005 (see Table 1). Only 6% passed the science part of the FCAT in 2005, and 4.8% passed the science portion of the examination in 2004. Also, only 2% passed the reading portion in 2005 compared to 4% who passed the reading part in 2004. Overall, only 16% passed one or more portion of the tests in 2005, and 22% passed one or more portion in 2004. These results show that there was a low student passing rate

in both years and that there was also a decrease in the rate in 2005.

Nationwide, there are low rates of students passing high school graduation and exit examinations. A 1989 study on education in America stated that low-esteem and feelings of not being accepted by their peers was the number one reason for high school students dropping out of school before graduation (Lather, 2001). The lack of student proficiency in basic skills (i.e., reading, writing, and mathematics) throughout the United States is staggering, such as reflected in the following facts:

1. According to Lather (2001), 30% of the American adult population cannot "read, write or reason well to compete in today's economy" (p. 52).

2. It will take 50% improvement by the year 2010 for the entire United States to match the Japanese and Europeans in functional literacy, general science, and worker training, according to Lather (2001).

3. High school dropout rates throughout the United States are climbing at exponential rates and have reached as high as 700,000 in 1 year. In some city areas, as many as 30% of American youth drop out before completing high school (Alden, 2000).

As a technology teacher, the researcher had the

opportunity to teach the students, examine student success, and review the effectiveness of the educational technology programs at the school. The researcher obtained written permission from the school principal and superintendent to perform this research.

Purpose Statement

This study explored several components of the present adult technology program. The project evaluated the effectiveness of the current technology program used to prepare adult students for FCAT and examined how computer technology was being used to teach mathematics, reading, and science and what might be done to improve student performance on the FCAT. At the time of this study, the students who were participating in the adult education program were achieving low scores on the FCAT. The researcher compared student skills and test scores with the district's FCAT standards. The project also evaluated the preparation and technology skills possessed by the instructors involved in the adult education program.

Research Questions

The research questions that were addressed by this researcher were as follows:

1. Is the education technology program achieving the desired school district goal and does the curriculum provide

the necessary technology skills to students that will enable them to pass the FCAT and obtain a high school diploma?

2. Does the school district have enough qualified and skilled technology teachers to improve the current education program?

3. Does the school district possess the innovative technology curriculum and personnel to meet its stated objectives of students' passing the FCAT and graduating?

4. Are the students and teachers optimally making use of the technologies available to them?

5. Are the students attaining higher levels of technological competence?

6. What specific skills and applications need to be considered in a high-quality technology program?

Definitions of Terms

For the purpose of this research, the following terms are defined.

Action learning. This term refers to the teaching of displaced adult students who have failed and a formation of a group of entities to solve a problem where feedback is provided to each entity for his or her actions or performance.

Adult education technology. This term refers to the use of computers (i.e., personal computers, mainframe computers,

projectors, etc.) and electronic media for adults to convey instructions to adult learners or teach adult learners.

Adult education center. This term refers to a school devoted to adults on numerous occasions or in other circumstances who need to prepare for college or take continuing education courses.

Adult learner. This term refers to an individual who has attained puberty and he/she is at least 16 years of age.

Electronic media and technology. This term refers to any electronic visual or audio aids and computers intended for use in learning and instruction.

Faculty. This term refers to all instructional incumbents or dignitaries in an educational setting.

Faculty development. This term refers to the development of individuals through training.

FCAT. This is an examination that high school and adult high school students are required to pass by the state of Florida before they can graduate and obtain a high school diploma.

Knowledge. This term refers to what is known and understood. It is also the ability to improve what already exists or is known.

Use. This term refers to the utilization of a tangible or intangible object to attain a positive result.

Chapter 2: Literature Review

Numerous strategies designed to improve student learning were identified in the literature. The research project examined the impact of faculty development, technology action learning methods, technology in education, knowledge-based technology, and representations of intelligent systems in improving technology-based instruction.

Faculty Development

Faculty development and evaluation share a common characteristic; they both have been subjected to varying interpretation in schools (Smith, 2000). According to Smith, faculty development activities include programs such as sabbatical leaves, faculty orientation sessions and professional conferences, mentoring initiatives, weekend institutes, or similar events. The most active professional development programs of the past were designed to help professors upgrade and update knowledge of their specialties. These programs may deliver their content in a variety of forms, such as written documents, face-to-face contact with individuals or in small groups, video conferencing, or other electronic presentations.

Gaff (2002) discussed the concept of professional development and model programs. Howey and Zimpher (2001)

stressed that to make a difficult job even more difficult, professional development of teachers or faculty must be embedded and integrated deeply in their ongoing activities. According to Howey and Zimpher (2001), the ways of doing things in schools must change so that faculty members can be enabled in a sustaining and pervasive manner.

Faculty members need adequate and appropriate training, and to hold certain pedagogical beliefs in order to use technology effectively (Murray, 1999). Educators and their students need sufficient and accessible equipment and the technology needs to be put into the right instructional environment (Berguson, 2005). Students also need to be supported at home in how they use educational technology. Educational leaders need to develop appropriate policies that encourage rather than unnecessarily hinder, block, or filter material that is relevant to a student's educational goals. To make all this happen, network administrators need to be available (i.e., staffed) in order to provide faculty, administrators, and student with sufficient technical and instructional support.

The need for professional development changes as the individual educator becomes more sophisticated and desires more control over how technology is deployed in the classroom. It is not uncommon for an individual instructor

to go through stages on how to deploy technology for instructional purposes. Initially, the individual educator may desire prefabricated solutions, such as packaged software and dedicated Web sites that define and control options. As the educator becomes more sophisticated, authoring tools may be desired to create software or develop Web sites or advanced Internet search skills to maximize control over how technology is deployed.

How can professional development opportunities be developed that will capture both the changes in technology and diverse levels of interest, knowledge, and motivation of individual instructors? The fact that the promise of technology to improve education will not be realized unless the professional development of teachers is incorporated into the process has been recognized similar to those in educational arenas. Financial support for professional development is being incorporated into technology initiatives. According to Berguson (2005), kindergarten to Grade 12 educational technology programs such as Digital High School, AP Challenge Grant, or Bill 2882, which disperses $175 million in funding to high schools to obtain and implement technology, all contain provisions for the professional development of teachers. Program models for professional development need to be created that enable

adult educators to offer resources to instructors without incurring additional development cost.

Uses of Technologies to Simplify Adult Learning

The use of technology or electronic media is another form of action learning in which technology is a process built on ideology, diversity, knowledge, and experience. Because technology comprises ways of solving difficult tasks or making them better, it can be viewed as an action learning plan. Langdon, Whiteside, and McKenna (2002) defined technology action learning as a group problem-solving process built on diversity; reflective questioning; and commitment to individual, group, and organization-wide learning. One or more technology action learning groups are formed to solve certain learning gaps or problems. Each group is composed of four to eight members from different functions or departments (Weinstein, 2001). Different types of technology will be used as action learning entities, just as people or experts are used as action learning groups. The formula for action learning is L = P + Q = R (L = learning, P = programmed instruction, Q = questioning, and R = reflection).

Langdon et al. (2002) explained that one of the fundamental beliefs underlying action learning is that people learn best when they take meaningful action to solve

important organizational problems and then reflect on what they have learned from the action taken. Just as with action learning, individuals have to reflect on actions taken during and after the technology process in providing solutions or adjustments as needed.

Action learning, a process to eliminate a problem, always focuses on the right questions rather than the right answers (Marquardt, 2001). As indicated by Marquartdt, action learning need not be implemented throughout an organization. Instead, it can be implemented in any area in which important problems exist and significant learning is possible or needed. The processes of implementing action learning in an organization involves (a) holding informational workshops, (b) establishing projects, (c) forming action learning groups, (d) working on problems, (e) recording findings, and (f) reflecting on the learning activities.

Technology in Education

The use of technology and electronic media may be beneficial to both students and faculty (Schacter, 1999). Better ways of teaching result in good ways of learning (Bassi & Van Buren, 2002). As shown in Figure 1, technology may be used to gain knowledge and practical experience. Technology may be used to gain knowledge and practical

experience. Chalk and blackboards have been replaced with marker pens, screens, videos, and projectors.

The use of technology changes the mode of teaching and helps eliminate fatigue resulting from burnout and teachers becoming disinterested. The use of technology tools enable faculty to spend less time in preparing lesson notes and allows more time for faculty members to individualize student learning experiences and to complete administrative functions.

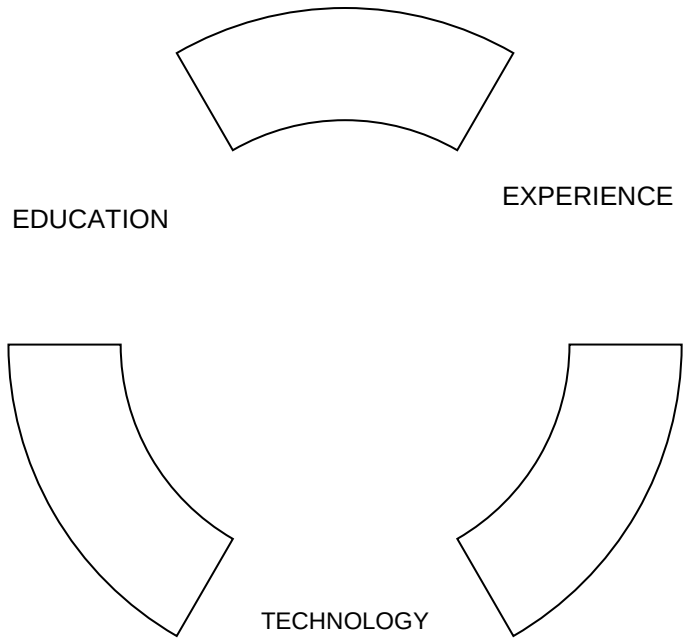

Figure 1. Theory of professionalism.

There is a technology-based focus on the field of education, looking at the ways in which artificial intelligence can be used in building educational software.

Many faculties in universities, such as New York University, Colombia University, and Harvard, are presently using various technology and electronic media to help facilitate their lectures (Salem, 2000).

In both 1995 and 1998, the California Adult Education Technology Education Survey by Outreach and Technical Assistant Network indicated a high and increased use of computers in adult education. According to the survey, a total of 18,825 computers were reported in use in California system alone, and 80% of the agencies responding to the survey reported Internet connections (Salem, 2000).

Parents, teachers, and students need to understand the value of using computers for enhanced learning, creativity, productivity, and communications. Schools rely on pencils, dictionaries, workbooks, and textbooks in more traditional classroom settings; they should come to depend on computers as modern learning tools. Unlike a workbook or textbook, computers and software are interactive and are often more appealing. Some software programs even have digitized sound, which allows the computer to “talk and coach.”

Technology as a research tool is an area that can be explored by students with the help of a computer and database program. Besides the traditional materials (i.e., encyclopedias and books), there are software and computer

tools that provide students with access to online database information and research reports. There are a number of research analysis and organizational tools that presently can be used.

Knowledge-Based Instructional Technology

The use of technology software agents within the computer-mediated learning environment has become an important focus of research educational context (Wilson, 2002). The use of technology in education has become the most challenging area in the last several years. It actually includes the use of many disciplines, such as (a) cognitive and social psychology, (b) artificial intelligence, (c) computer science, (d) empirical psychology, and (e) software engineering.

According to Salem (2000), the goal of technology in education is to deliver computer-based systems (or knowledge-based software) that can be used in real teaching, learning, and training situations. Salem further stressed that there is intelligence software (or educational-based software) that is a knowledge base and an inference system. The knowledge-based software is made up of facts, concepts, theories, procedures, and relationships representing real-world knowledge about objects, places, events, people, and so forth. According to Gains and Leonard (2001) and

Salem, the inference system or thinking mechanism is a method of using the knowledge base to promote reasoning.

Representations of Intelligent Systems

Computers are perceived to be intelligent systems. Intelligence can be defined in many ways. From the perspective of a literary observer, intelligence is often referred to as "being smart"; that is, being able to act intelligently when dealing with everyday life situations. According to Merriam and Caffarella (1999), there is also another definition of intelligence that many adults may have carried with them since their elementary school days: Intelligence is a specific measurement of their ability to learn. The intellectual functioning in adulthood is very intriguing and useful for educators of adults in society today. The concept of intelligence has really become more complex and multifaceted over the last 2 decades, often causing confusion as pointed out by Merriam and Caffarella. There are at least two theoretical perspectives, those of information processing and psychometric tradition, that have driven the study of intelligence according to the process of orientation of Piagetian and Neo-Piagetian thought (Knowles, 1980).

Does Intelligence Really Decline With Age?

The responses to this question were really mixed and

often controversial. According to Merriam and Caffarella (1999), the classic school of thought says that intelligence enters a process of irreversible decline in the adult years. Others say that intelligence is relatively stable in the adult years with substantial intellectual changes occurring only very late in life and primarily in abilities that are less central to the individual's life experience and thus perhaps practiced. Some say there is no decline of intelligence in adulthood until one is close to death. In fact, some intellectual functions, no matter what testing procedures are performed, seem to increase over the course of the years. The response to whether intelligence declines in later adulthood is not clear-cut.

Thorndike, Bregman, Tilton, and Woodyard (1928) concluded in their studies that

> in general, teachers of adults of age eighteen to forty-five should expect them to learn at nearly the same rate as they would have learned the same thing at sixteen. There is no decline in adult learning ability at the age twenty to forty-five but other studies (Jones and Conrad, 1999; Miles and Miles, 2003) found that this may not be so at a later age--the rate of learning tended to decline at age forty-five and over. (p. 179)

Individuals tend to learn more by everyday observations and experiences as they grow older but may tend to lose control of what was learned if they do not follow up on that which they have learned (Knowles, 1980). The adage that "you

cannot teach an old dog new tricks" actually haunts both the adult instructors and adult learners themselves as they set forth on new ventures. The powerful myth that adults lose their ability to learn as they age does prevail although, for most part, it has not been substantiated in the literature (Merriam, 2001). The researcher believes that the longevity of a human is the homogeneity of his or her body, and the spontaneity of his or her adaptability is the objectivity of his or her consciousness. This is to say that as we grow older, our body tends to deteriorate whereas our mind and intellect or conscience tends to grow along according to our adaptability in a positive direction.

Methods of Adult Education

Many adults learn by quantum thinking, which means looking at the world in a new way based on the century-long work of physicists and scientists who moved beyond classical or Newtonian mechanics to the new paradigm of quantum physics (Vella, 2002). Adult learners also try to learn by participation; the observer is part of what he or she observes. Each person's perception of any given reality is different depending on his or her context and culture. According to Vella, "we often evoke the world we perceive" (p. 245).

Learning demands energy. An individual should always

remember that many principles and practices of dialogue education, which is one of the adults' methods of learning, are designed to raise and sustain the energy of learners. The energy exerted on learning by adult learners enables them to assimilate the content of what they have learned.

Safety is an issue when discussing learning methods of adults. A safe context for learning has to be created that is appropriate for adults and challenges them accordingly; by doing this, their knowledge increases (Dale, 2000). A site for learners needs to be provided to explore the uncertainty of any skill or theory, providing a safe place for thinking that is needed if their learning is to be relevant to their unique context. Safety enables the teacher to create a setting that is inviting for adult learners. Adults have shown that they are not only willing but also ready and eager to learn when they feel safe in the learning environment. Trust in the competence of the design and skills of the teacher enable the learners to feel safe (Vella, 2002). This researcher believes that trust in the feasibility of the objectives and relevance of these objectives also enable adult learners to feel safe.

Adults learn through experiences and by making decisions in their lives. The power of learning can be strengthened and be more profound when adult learners feel

that they are respected as subjects or decision makers in the learning process. Respecting learners as subjects or decision makers of their own learning is a principle that involves the recognition that adults are indeed decision makers in large parts of their lives (Vella, 2002).

Adults learn by celebrating together. Teamwork plays a vital role in enhancing and motivating adults to learn (Hatch, 2000). Teamwork is a principle of adult learning as well as an effective practice.

Faculty, as leaders, often preach teamwork but often excuse themselves from its practice and even more often fail to hold people in their organizations accountable for living this value (Dyer, 2000}. According to Davies (2003), the failure to uphold espoused values in general and teamwork in particular is one of the biggest frustrations in the workplace.

The use of teams during a change effort is not a new concept; however, using them effectively can mean the difference between successful change and failure. Educators try to change the life of the adult learners. According to Galpin (1996), in order to involve the greatest number of people during a process of change, improvement teams may be set up at all levels of an organization, from top administrative level through frontline staff. Teams should

be well organized and well coordinated. As Galpin stressed, it is not the volume of teams that will achieve success but the effective organization and operation.

Kolb's Theory of Adult Learning

According to Kolb (1979), there are four different types of individuals in the experiential learning process, as follows:

1. Divergers. These categories of individuals actually transform the experience through reflective observation by taking in the experience through solid experiences. The divergers view all the different aspects of a situation and then combine them into a meaningful one.

2. Assimilators. Abstract conceptualization is injected by these individuals and is transformed through reflective observations. The assimilators are good in creating theories and converting the diverse data into an integrated whole.

3. Convergers. These learners take in the experience through abstract conceptualization and transform it through active experimentation. According to Kolb (1979), these individuals are able to consume ideas and arrive at the correct solutions.

4. Accommodators. These individual learners consume the experience through solid experience and transform it through solid active experimentation or participation. The

accommodators are actually risk takers who are able to adjust to new situations, and this type of learner uses trial-and-error methods in learning subjects.

Importance of Kolb's Contributions to Improving the Learning Process

Kolb's contributions in recognizing and providing for varying learning styles and improving the learning and teaching process are of great importance to education. Kolb's contributions actually justified the psychological and the physiological processes of learners acquiring knowledge about their ability to think and learn from experiences (Bonwell & Eison, 1999). The four phases of Kolb's learner modes are very important to the learner's success in acquiring knowledge. Observations of self and others play a vital role in learning and teaching (Erickson, 2002). Erickson further stressed that through observations of self and others, learners are able to assimilate and converge what they have learned.

Kolb's theory is a cognitive style of learning. It is also a preferred physiological modality of learning and teaching. With Kolb's theory, the strategic learners need to be able to set and use meaningful goals to help them generate and maintain their motivations for learning (Schunk, 1999).

Reflection is a way to convey to the individual

learners what has been learned, and it also enables the learners to make assumptions as to what is to be learned (Resnick, 2002). Providing learners with appropriate opportunities to reflect on the subjects or topics under discussion might be useful to them as they strive to reach their personal, social, and occupational goals. Skills are very important in the learning process. Experiences and skills are both the conjectures of knowledge. Learners must want to learn if they are to acquire the knowledge of the subjects. According to Paris, Lipson, and Wixson (1999), "skill and will" actually results in self-regulated learning. According to Kejawa (2004), the technological world plays a role in the development of adult education. Kejawa stated, "The longevity of the learners is the homogeneity of their body, and the spontaneity of their adaptability is the objectivity of their consciousness" (p. 2). The modalities of learning comprise all entities of understanding human processes.

Kolb's Theory in an Adult Educational Setting

An example of Kolb's theory of learning in an adult educational setting is where the learners engage in laboratory work (Robertson, 2003). A laboratory is established where knowledge is put into practice. The process of assignments or works (i.e., the use of computers)

are observed and reflected upon in a practical manner (Cyrs, 2000).

Another example is the internship program adopted by various schools, universities, colleges, and high schools. Learners are able to bring to the classroom experiences from the workplace and take to the workplace experiences from the classrooms.

Testing is also a way to relate to Kolb's learning theory. It is a way to measure what has been learned through experience (H. Miller, 2003). Experience may be through studies or participating in actual activities. Testing is a meaningful learning experience because the learners get to express themselves and diverge and assimilate what has been learned. Figure 2 is a representation of Kolb's learning and teaching theory and modality.

Kolb's theory of learning can be practical and adeptly applied to computer instruction (Joyce, 2000). Concepts and generalization of the topics must be made visible and adaptable so the learners can reflect, diverge, assimilate, and accommodate the learned process (Mckeachie, 2001). The learner analysis and contextual analysis should be viewed as identifying constraints to learning and teaching. Experience of the subjects can be attained through repetitive practice of the learned processes. Divergence and convergence of the

concepts are mandatory consequences of learning a subject.

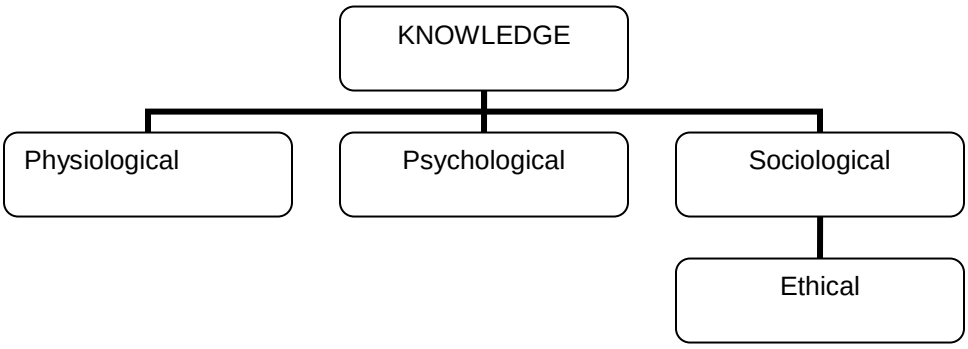

Figure 2. Kolb's learning and teaching theory.

Adult education is a process in which adults acquire knowledge or skills through cognitive learning experiences. It is an extension of what has been learned in childhood (Knowles, 1980). Rather than following a specific theoretical approach, adult learning is based on the practical approach of learning methods (Knowles, 1980). The adults themselves determine what it is they want to learn, and the adult educators create the individualized materials to be learned.

Educational technology is not simply a matter of providing a standalone computer laboratory accessible only at a certain time of day. Technology, in order to be effective in raising student achievement, must be integrated within the instructional and curricular framework (White, Ringstaff, & Kelley, 2002). It must complement an

instructional objective rather than be regarded by faculty and administrators as an unnecessary intrusion into a preestablished curriculum (Ringstaff & Kelley, 2002; Schacter, 1999).

According to Erickson (2002), popular rhetoric suggests that everyone can improve his or her life situation through learning. The majority of adults learn to survive in the world of today because without new knowledge of both the socioeconomical and technological innovation of today's market, nothing would be possible. Without the economical and technological knowledge of today's world, many adults would have a hard time to succeed both economically and sociologically.

There is always a question that comes up when addressing the topic of adult learning. Do adults really learn differently from children? The answer to this question is not far fetched. Over 30 years ago Knowles (1980) proposed "a new label and a new technology" (p. 351) of adult learning (i.e., andragogy) to distinguish it from preadult schooling (i.e., pedagogy). As Knowles (1980) pointed out, andragogy, which means the art and science of helping adults learn, is quite different from pedagogy, which means the art and science of helping children learn. As a person matures, his or her self-concept moves from

dependent personality toward being a self-directing human. It is further stressed that an adult accumulates a growing reservoir of experience, which is a rich resource for learning (Merriam, 2001).

This researcher believes the readiness of adults to learn may be closely related the developmental tasks of their social activities. Adults actually are motivated to learn by internal factors rather than external ones (Knowles, 1980). The rewards of acquiring new knowledge are the basis of adult learning. The satisfactions attained from learning may depend on how well a subject is delivered and how motivated are the learners.

Adult learners surface from different types of predicaments. Some adult learners are either seeking new skills or trying to improve the old ones. Some adult learners are also either raising a young family or caring for elderly family members. By looking at the adult learning perspectives, different situations may call for different learning experiences (Aker, 1999). Many adults may have turned to learning because of the situations they face in their life. For example, they may have been displaced from work or had an accident that required an individual to learn new skills or update existing skills.

It can be reiterated that the use of electronic media

and technology is surely the path to acquire and apply knowledge (Statham & Torell, 1999). Is electronic media and technology the path to perceive and manipulate things in the physical world? Indeed, these paths are part of technology according to Salem (2000). The use of technology excites people who want to uncover principles that all intelligent information procedure must be exploited, not just those made of wet neural tissue. Consequently, there is neither an obsession with mimicking human intelligence nor prejudice against using methods that seem to involve human intelligence (Sternberg, 2000).

Just as psychological knowledge about human information processing can help make computers intelligent, theories derived purely by using computers suggest possibilities about methods to educate people better (Winston, 2001). In other words, the methodology involved in making smart programs may transfer to making smart people. It is perceived that rather than eliminating the jobs of qualified technology education faculty, it is in the best interest of the schools to undergo the faculty development processes.

Motivation Theory Affecting Adult Learners

Motivation is a basic psychological process. According to Maslow (as cited in Luthans, 2002), the father of motivation theory, there exists hierarchy of needs that are

classified as (a) psychological, (b) safety, (c) love esteem, and (d) self-actualization. The basis of Maslow's theory is that human beings are motivated by unsatisfied needs and that certain lower needs should to be satisfied before higher needs can be satisfied. The motivators for adult learning or education by applying Maslow's theory of motivation are (a) achievement, (b) recognition, (c) work itself, (d) responsibility, and (e) advancement (Luthans, 2002).

Basic principles of motivation do exist that are applicable to learning in any situation. The environment can be used to focus the student's attention on what needs to be learned. Teachers who create warm and accepting, yet business-like atmospheres, will promote persistent effort and favorable attitudes toward learning (Luthans, 2002). This strategy will be successful in both children and adults. Interesting electronic visual aids, such as excerpts, posters, or practice equipment, motivate learners by capturing their attention and curiosity (Heller & Yukl, 2002).

According to Rossiter (1999), incentives, such as granting privileges or giving praise, motivate learning. The instructor should determine an incentive that is likely to motivate an individual at a particular time. As Rossiter

stressed, in a general learning situation, self-motivation without rewards will not succeed. Student must find satisfaction in learning based on the understanding that goals are useful to them or, less commonly, based on enjoyment of exploring new things.

Internal motivation is longer lasting and more self-directive than external motivation, which must be repeatedly reinforced by praise or concrete rewards (Weiner & Kukla, 2001). Some individuals, particularly children of certain ages and some adults, have little capacity for internal motivation and must be reinforced constantly (Wentzen, Wainberger, Ford, & Feldman, 2001). The use of incentives must be based on the principle that learning occurs more effectively when a student experiences feelings and satisfaction. According to Weiner and Kukla, caution should be exercised in using external rewards when they are absolutely necessary; their use may be followed by a decline in internal motivation. Learning is most effective when an individual is ready to learn, that is, when one wants to know something. Sometimes the student's readiness to learn comes with time, and the instructor's role is to encourage its development.

Motivation is enhanced by the way in which the instructional material is organized (Tennant, 1997). The

best organized material may make the information more meaningful to an individual. According to Tennant, one method of organization includes relating new tasks to those already known. Other ways to relay meaning are to determine whether the persons being taught understand the final outcome and instruct them to compare and contrast ideas.

Plato Software as Learning Tool

Before the World Wide Web, the Plato system pioneered online forums and message boards, email, chat rooms, instant messaging, remote screen sharing, and multiplayer games, leading to the emergence of what was perhaps the world's first online community. Plato, which means Programmed Logic for Automatic Teaching Operations, is revolutionary effective instructional software (Wolley, 1999). The Plato system was designed for computer-based education. Plato is a time-sharing system. According to Wolley, it was one of the first time-sharing systems to be operated in public.

When using Plato, every note or response appears on its own screen. Because Plato was designed for education, its architecture was biased toward carefully crafted full-screen display (Wolley, 1999). For taking notes, this is an advantage. The note title, date, time, and author's name always appear in the same place. Many institutions, such as New York University and Adelphia University, have

successfully utilized Plato as an instructional software tool. There are myriad games on Plato. Some games are for single players, but the most popular ones involve two or more players at separate terminals. One of the advantages of Plato is that assignments are graded automatically with feedback.

Programmed Learning: Linear Versus Branching

Traditional education is typically linear in that an individual's studies and learning always builds upon prior knowledge. Technology education may be termed as branching because an individual is always learning new things as technology changes and it varies from stage to stage.

Desai (1985) compared the programmed learning approach with learning through experiment (i.e., using slides and facilitating discussion) and the traditional way of teaching science to students in eighth grade. He concluded that the programmed learning approach was better than the traditional method but on par with teaching using slides (Lather, 2001). It was discovered that learning through experiment was the best method. The usual way of classroom teaching showed the poorest results. Although, these findings can be justified by a common sense argument, emphasis on learning rather than teaching, visual aids, and do-it-yourself experiments should get better results than the passive recipient approach

commonly used in classroom teaching. Critical theorists view programmed learning as achievement through critical reflection and consciousness raising while postmodern theorists view it as achievement through deconstruction, play, and eclecticism (Avis, 1999).

Summary

A comprehensive review of literature was conducted. It examined technology in (a) adult and general education, (b) faculty development, (c) education models, (d) action learning methods, and (e) instructional technologies. Sufficient reference material was identified and abstracts were reviewed. This review was conducted to obtain as much information as possible regarding the use of technology in education, particularly as it applies to adult basic skills learning.

Acknowledgement of the invisible yet significant informal learning that takes place by using computer technology was explored. Informal learning, a category that includes incidental learning, may occur in institutions, but it is not typically classroom based or highly structured. Control of learning rests primarily in the hands of the learners. How technology affects adult learning was emphasized. Various adult learning patterns or methods were also explored in detail. An attempt to develop a typology or

categorical checklist of the wide range of techniques available for helping adult learning was developed. Probably no aspect of education is in such a state of technological ferment as having to do with the materials and devices, such as audiovisual aids, training aids, and educational media (Knowles, 1980).

Chapter 3: Methodology

The research method that was used for this study was the evaluation method. This method was chosen because a technology program already existed and needed to be measured. It was mandatory for the researcher to understand all elements of the evaluation methodology in order to be successful in this study. A literature review was conducted to explore the existing research to the basic tenets of this study.

The context-input-process-product (CIPP) model was used as the evaluation-designed method for this research. According to Isaac and Michael (2001), CIPP model allows specifications of a series of steps to be pursued in carrying out an evaluation of the outcomes or products of educational programs relative to specified objectives.

This model was appropriate for this research because the outcome of a product and its objectives were measured. The CIPP model actually serves four types of decisions that reflect (a) planning, (b) structuring, (c) implementing, and (d) recycling decisions that determine whether to continue, change, or terminate the activity or the program itself. Four questions are answered under the CIPP model:

1. Which objectives should be obtained?
2. Which strategies or procedures should be tried?

3. How adequately are these strategies or procedures working?

4. How effectively are the goals and objectives being accomplished?

Participants

The target population for this research study was composed of current students and teachers of the adult education center. The accessible population was the total number of students who took the FCAT in the fall of 2005 and spring of 2006 and currently employed teachers.

At the time of this study, there were a total of 500 students and 30 teachers. Fifty students were randomly selected from the student database of the students who took the FCAT and 15 teachers were selected from the human resources teachers' database. The demographic status of the students was mixed and ranged in age from 18 to 22 years old.

Procedure

A formative committee was established to provide input during the design of the survey for the evaluation of the use of technology in education. The committee participating in the development of the survey consisted of two students, three faculty members (teachers), one administrator, and a human resource specialist. The formative committee also

determined whether the survey met the goal or purpose of the research. When the formative committee certified that the survey met the criteria and the objective of the research, the survey was mailed to the participants who were selected for the study.

The results of the survey were collected, tabulated, and analyzed. The results were presented to the formative committee to determine if further information was needed from the surveyed faculty and students.

A summative committee was formed to validate the content of the evaluation criteria. This committee was composed of the two technology experts, two curriculum experts, and two human resource experts from other school districts.

The researcher developed assessment criteria to be used to evaluate the results of the survey. The criteria included the information gathered from the literature review and the analysis of the results.

Assessments were provided to the formative committee for its review, input, and comments. Recommendations and comments from the formative committee were collected in writing and used to modify the survey.

When approved by the formative committee, the modified assessment criteria with the analyzed survey results were

presented to the summative committee for validation purposes. Their comments and recommendations were collected in writing and were used to finalize the criteria of the survey and the results.

The researcher provided the final copy of the evaluation report, which included the survey, the results, and the researcher's recommendations to the school superintendent and principal of the school.

Instruments

A survey was used as the data collection instrument for this research. The survey that was used was a Likert-type survey. The researcher developed 31 questions (see Appendixes A and B) on the purpose and objectives of the research. The survey question objectives were based on the composition of the education technology program of adult education at the school district. The research subjects, in this case the faculty and students, were selected randomly from the lists obtained from the school. The 21 questions (see Appendixes A and B) were mailed to 15 instructors by third-class mail and accompanied by participant solicitation letters. The survey was completed by the selected faculty and selected students within a given time frame and returned to the researcher for analysis and evaluation. Ten questions (see Appendix C) were mailed to 30 randomly selected

students to answer and return to the researcher within a given time frame.

According to the review of literature, the use of technologies (i.e., computers, projectors, and videos) enhances performance and also provides students with easy understanding of the subject, thus improving instructional effectiveness. The questions on the survey were very important to the success of the evaluation.

Anticipated Outcomes

It was anticipated that this research would be beneficial to the students as well to the teachers and the school district. Additionally, the research findings could identify the need to hire additional qualified technology resource teachers and provide veteran teachers with comprehensive professional development programs. Students could, in turn, receive adequate learning methods and be proficient in the use of technology. If problems associated with the education technology program of the school district existed, recommendations would be made to remedy the problems. The results of this research were designed to improve student performance on the FCAT and ensure that technology teachers were prepared to use technology effectively in their teaching.

Chapter 4: Results

The results generated from the data collection were very positive and firmly met the criteria of the survey, reinforcing that technology is a formidable preparatory tool in education. Technology is an important tool in the delivery of instructions and tutorials by faculty at the adult education center. The result of the evaluation of the adult education technology program clearly illustrated that the use of technology as a preparatory tool for preparing adult students for the FCAT in mathematics, reading, and science was very effective. In 2005, students studied and used the Plato program as they did in 2006. However, in 2006, the faculty members were better trained in the use of the program.

The 50 students who took the FCAT in 2005 and in 2006 were randomly selected from the student database. Their results were tabulated and analyzed. Thirty five of the 50 students passed the mathematics portion of the FCAT in 2006, scoring 300 or more, compared to 12 out of 50 students who passed mathematics in 2005, scoring 300 or more (see Table 2). The drastic increase in the number of students who passed the mathematics component of the FCAT between 2005 and 2006 illustrate that the technology used in the preparation for the FCAT in mathematics was a huge success

even though not all the students passed. Table 2 reflects the number of students who passed the reading portion, the number of students who passed the science portion, and the number of students who passed the mathematics portion.

Table 2

Florida Comprehensive Assessment Test Student Scores, 2005 and 2006

Level	Score	Reading	Science	Mathematics
		2005		
I	0-99	4	1	2
II	100-199	17	9	18
III	200-299	27	30	18
IV	300-399	2	10	18
V	400-500	0	0	0
		2006		
I	0-99	2	0	0
II	100-199	5	2	3
III	200-299	18	18	12
IV	300-399	25	30	35
V	400-500	0	0	0

Out of 50 randomly selected students who took the FCAT

in 2006, 25 students successfully passed the FCAT reading portion, scoring 300 or more points, compared to 2 students who passed in 2005, scoring 300 or more points. The results in reading also showed that the technology program was very effective used as a preparatory tool. More students were able to complete the reading portion of the FCAT successfully with 300 or above points (this is the minimum passing grade).

From the 50 randomly selected students who took the 2006 FCAT in science, 30 students successfully passed the examination with a score of 300 or above compared to 10 students who passed in 2005 with a score of 300 or above. This was also a great improvement in the science area of the FCAT in 2006. These results clearly showed that the adult education technology program was working well.

Apart from passing the FCAT in mathematics, reading, and science, there was a tremendous improvement in scores at various levels. Only 2 students fell into the Level I category, scoring between 0 and 99 in reading in 2006, a decrease from the previous year, and no students fell into this category in mathematics and science. Only 3 students scored within Level II, scoring between 100 and 199, in the mathematics portion of the examination in 2006 compared to 18 students at this level in 2005. The number of students at

Level II in 2006 diminished tremendously from the number of students at Level II in 2005. This showed an improvement in the grade level of students who took the mathematics examination. There was also a decrease in the number of students who fell into the Level II category in 2006 for the science part of the FCAT with only 2 students compared to 17 students in 2005 reading at this level.

There was a slight decrease in the number of students who fell into Level III (near pass) in 2006 in all the subject areas compared to that of the previous year. Nearly half of the 50 students passed all the subjects of the FCAT. Table 2 shows that half of the students were at the Level III category (near pass) in 2005 and more than half of the students actually were at Level IV category in 2006. The adult technology program did prove effective as demonstrated by the number of students who were able to perform well on the FCAT in mathematics, reading, and science. Even though no student scored between 400 and 500 (high pass), the program significantly impacted student success.

Table 3 illustrates the number of students who passed the three components of the FCAT in 2005 and 2006. Only 20% passed the science part of the FCAT in 2005, and 60% passed the science portion of the examination in 2006. Also, only 4% passed the reading portion in 2005 compared to 50% who

passed the reading part in 2006 (see Table 3). Seventy percent passed the mathematics portion of the examination in 2006, and only 24% passed the math portion in 2005. This was a tremendous increase in one year.

Table 3

Florida Comprehensive Assessment Test Student Results, 2005 and 2006

Subject	No. tested	No. failed	No. passed	% passed
		2005		
Reading	50	48	2	4
Mathematics	50	38	12	24
Science	50	40	10	20
		2006		
Reading	50	25	25	50
Mathematics	50	15	35	70
Science	50	20	30	60

Overall, 16% passed one or more portions of the test in 2005, and 60% passed one or more portions of the test in 2006. These results validate the use of technology as a teaching tool at the adult education center. The technology

program adopted by the adult education center proved to be successful, which was supported by the literature. When technology is used properly, it does improve the learning process.

The 50 students whose results were obtained from the student database were also surveyed to see if they were satisfied with the technology program at the center. Ninety-five percent of the students surveyed agreed that the Plato computer software program did improve their knowledge of understanding mathematics, and 90% agreed that it did improve their understanding of reading and science. This shows that the Plato computer software program is an effective instructional tool that when used properly, can improve the teaching of adult basic education in mathematics, reading, and science. The majority of the students who were surveyed, approximately 92%, indicated that all the technologies used in preparing them for the FCAT helped them increase their skills. Ninety-five percent also agreed that the teachers at the adult education center were answering all questions concerning the use of technology, and 97% said that teachers were also instructing or assisting in the content areas of mathematics, reading, and science. One hundred percent of the students indicated that they communicated with teachers via e-mail.

On the question regarding the video portion of the Plato computer software, 94% agreed that they used it to study, and only 6% did not use the video component of the program. Ninety percent of the students who were surveyed agreed that the incentives offered by the center did motivate them to study harder for the FCAT. This proved the theory of learning reinforcement to be practical and true. According to the survey, 90% agreed that they did not need more technologies to be used in preparing them for FCAT, and 10% said they did need more technologies to be used in preparing them for FCAT. These results answered Research Question 1 that the use of technology in teaching does improve the basic education in mathematics, reading, and science.

Fifteen faculty members of the adult education center were surveyed and 100% of the faculty responded to the survey. The responses to this survey showed that various kinds of technologies and electronic media were being used by faculty at the center.

The result of the types of technologies used by faculty to enhance the teaching of their students can be found in Table 4. Of the 15 faculty surveyed, 10 responded they always use the overhead projector to teach their courses, and the remaining frequently used this type of

technology. The use of projectors amounted to 100% of those surveyed. The survey indicated that 53% of the faculty always used power point to convey instructions to their students, 27% frequently used this type of technology, and only 20% seldom used power point in their teaching. According to the survey, all faculty members occasionally used power point to teach their students.

Of the 15 faculty members who were surveyed, 93% used movies and only 7% did not use this kind of media to teach their students. In examining the use of video, 53% of the faculty always used this kind of media, 27% frequently used it, and only 20% seldom used it for instructions. All faculty members used video to convey instructions to students at the adult education center. One hundred percent of the faculty used the Internet for teaching purposes, and 93% used television to enhance student learning.

Table 4 illustrates that 100% of the faculty surveyed were using technologies of some kind to enhance instructions to students at the adult education center. This was a significant shift in why faculty were embracing the use of technologies at the center, in particular, and the use of the Internet as the preferred technology. The faculty perception of the percentage of time faculty used each technology to teach their students at the center can be

found in Table 5.

Table 4

Number of Responses to Effective Use of Technology

Question	Always	Frequently	Seldom	Never
Overhead projector is the technology I use to teach	10	5	0	0
Power point is the technology I use to teach	8	4	3	0
Movies are the technology I use to teach	5	7	2	1
Interactive video is the technology I use to teach	8	4	3	0
Internet is the technology I use to teach	15	0	0	0
Television is the technology I use to teach	7	4	3	1

N = 15.

Faculty clearly preferred the use of the Internet over any other media resource at the center. The literature review supported the use of such media to convey instructions as a teaching tool to enhance student success in adult education.

Table 5

Percentage of Time Technology Was Used by Faculty

Technology	%
Overhead projector	10
Power point	13
Movies	4
Interactive movies	5
Internet	65
Television	4

Table 6 indicates the type of technology that faculty would like to use more effectively in teaching or delivering their learning material at the adult education center. Sixty-seven percent of the faculty members who were surveyed agreed that television is the technology that they would like to use more effectively, and 33% disagreed. Only 7% of the surveyed faculty members responded the Internet is the technology they would like to use more effectively. This supported the fact that the vast majority of the faculty already used the Internet as their primary teaching tool.

The survey also indicated that there were a significant number of faculty members who would like to use television,

interactive video, and movies to teach more effectively. The results of the survey illustrated faculty perceived that they were using the Internet, power point, and overhead projectors effectively at the center.

Table 6

Responses to Effective Use of Technology

Questions	SA	A	N	D	SD
Power point is the technology that I would like to use more effectively in the classroom	3	2	3	5	2
Interactive video is the teaching technology that I would like to use more effectively	5	3	4	2	1
Movies are the teaching technology I would like to use more effectively	6	3	2	2	2
Overhead projector is the teaching technology that I would like to use more effectively	2	1	4	6	2
Internet is the teaching technology that I would like to use more effectively	0	1	2	10	2
Television is the teaching technology that I would like to use more effectively	7	3	0	4	1

Note. SA = strongly agree; A = agree; N = neutral; D = disagree; SD = strongly disagree.

The results of the survey used to identify faculty

development needs are found in Table 7, which shows that 93% of the 15 teachers who were surveyed indicated that the institution is providing enough software and hardware for the use of technology in teaching. However, 7% felt there was a need for additional software and hardware to be made available. Those who indicated there was a need for additional software and hardware explained that each teacher should be supplied with a personal computer and the compatible software rather than sharing computers with each other.

It was further indicated on the survey that the institution was providing enough training and coaching to enable the faculty to use electronic media and technologies effectively. Of the 15 surveyed faculty members, only 3 said that there was not enough teaching and coaching provided, and 12 of the members who were surveyed agreed that enough training and coaching was being provided. Those who disagreed indicated that faculty should "brush up" their education or training every 6 months rather than once a year. As discussed in the literature review, faculty development is an important aspect in the use of technology in teaching, and the results of the survey proved this to be true. Without effective training and coaching, faculty members will not be able to update their skills.

Table 7

Responses of Faculty to Technology Provisions

Question	Yes	No
Is the institution providing adequate software and hardware for the use of technology in teaching?	14	1
Is the institution providing enough training and coaching to enable you to use electronic and technologies effectively?	12	3
Do you want the institution to provide additional funds to the training of personnel and faculty to use teaching technologies more effectively?	10	5
Have you ever used e-mail to communicate with your students before or after classes?	15	0
Is the Plato computer software helping the students to comprehend the reading lessons?	15	0
Is the Plato computer software helping students to comprehend the mathematics lessons?	15	0
Is the Plato computer software helping students to comprehend the science lessons?	15	0

The questions dealing with the provision of additional funds for the training of personnel and faculty to teaching technologies more effectively indicated that 67% of the 15 members who were surveyed said that the center did not need

to provide additional funds, and 33% said the center needed to provide more funds for training.

The survey demonstrated that 100% of the faculty had used e-mail to communicate with their students before and after classes. The surveyed faculty indicated that 75% of their communication with students was by e-mail, reinforcing the value of e-mail as a communication tool between teachers and their students.

One hundred percent of the faculty said that the Plato software was helping students to comprehend reading, mathematics, and science. This software provides an overview of the subject matter and an in-depth comprehension of the contents of the subjects.

The results from all the surveys as reported in Tables 2-7 were discussed with the formative and summative committees and the results were analyzed. Both committees eminently supported the idea that the use of technology is helping the students to achieve their goals and that more training and coaching could improve the ways technologies are used in teaching the students at the center.

The questions posed and addressed by the researcher and the committees were the following:

1. Did the research survey achieve the intended goals of the study?

2. Did the surveys generate useful information to reinforce the program?

3. Were there any ideas about how to improve student results?

In response to these questions, the committees agreed that the survey did achieve its intended goals. The committees also agreed that the survey did generate valuable information and that new ideas on how to improve the program were worthy of consideration. According to the summative committee validation, the result of the survey met the purpose of the research questions.

Research Question 1 was, Is the education technology program achieving the desired school district goal and does the curriculum provide the necessary technology skills to students that will enable them to pass the FCAT and obtain a high school diploma? The results show that education technology is achieving the desired school district goal and the curriculum does provide the necessary technology skills to students that will enable them to pass the FCAT and obtain a high school diploma.

Research Question 2 was, does the school district have enough qualified and skilled technology teachers to improve the current education program? The results also show that the school district does have enough qualified skilled

technology teachers to improve the current education program.

Research Question 3 was, Does the school district possess the innovative technology curriculum and personnel to meet its stated objectives of students' passing the FCAT and graduating? The results show that the school district possesses the innovative technology curriculum and personnel to meet its stated objectives of students' passing the FCAT, enabling students to graduate.

Research Question 4 was, Are the students and teachers optimally making use of the technologies available to them? The results show that the students and teachers are optimally making use of the technologies available to them. Faculty enjoy using technology and electronic media to teach their subjects.

Research Question 5 was, Are the students attaining higher levels of technological competence? The results show that the students are attaining higher levels of technological competence. Furthermore, technology helps the students to pass the FCAT.

Research Question 6 was, What specific skills and applications need to be considered in a high-quality technology program? The specific skills and applications needed to be considered in a high-quality technology program

are the adequate use of technology and its software, and these were carefully considered.

The importance of professional development for teachers who use technology in the classroom is extremely important. Teachers trained in the use of technology achieve greater student performance. The results of the research were positive. The following chapter will translate the findings generated from the study into concrete recommendations designed to enhance further student success. It will also identify the transition of the study and the need for further investigation.

Chapter 5: Conclusion

For faculty members who did not experience group learning as students, shifting from the traditional lecture format to group-centered, technological problem-based learning may be very intimidating. By structuring a course with ground rules for the group, roles of responsibility, and individual accountability, the action learning practitioner can greatly remove, if not eliminate, the ability of the "slacker" to benefit from the hard work of others. Knowing that their individual efforts would be recognized and protected gives students the freedom to take full advantage of the power of technology in developing knowledge.

Overview of Applied Dissertation

This study was designed to determine if the use of technology in teaching is really helping the students at the adult education center to pass the FCAT. The results of the research proved to be positive. The use of technology did significantly increase the students' passing rate on all three areas of the FCAT.

As indicated in the review of literature, the field of education has indeed become focused on technology-based instruction, looking at the ways in which intelligence can be used in building educational software. At the adult

learning center, many of the center's instructors are presently using various technology and electronic media to help facilitate their approach to teaching and student learning. According to Salem (2000), the inference system or thinking mechanism can be a method of using the knowledge base, that is, reasoning with it to solve problems.

The ultimate promise of any new technology is not easily projected. It does seem fairly certain that the linking of the computer with its capacity for rapid and versatile information processing to that of a laser-operated videodisc player provides opportunities limited only by the imagination and persistence (Nicodemus, 2004).

The interactive use of the videodisc with computer link permits presentations of both moving visuals and still frames. The use of such technology, with nearly instantaneous random access to any of thousands of pieces of information, is unique and promising for many varieties of learning activities. Teaching episodes can be viewed, analyzed, and reviewed for focused discussion or manipulated with both sound and visuals (Moses, 2003).

Although costs have been prohibitive in the past, the flexibility, speed, and versatility of the computer link to videodisc or video cassette player now offer possibilities of simulated training that are extremely valuable to student

learning. It is now more practical and economical to use video simulations of problems and simulations linking microcomputers to provide for rapid response and feedback. It is also important to take into consideration the changing working conditions where learning takes place when assessing faculty performance, particularly as it is related to faculty use of teaching technologies. Improving the instructional resources is also of importance when considering the evaluation of faculty performance. The improvement of faculty performance depends on the improvements of the tools for instruction and instructional goals and objectives (Howes, 2000).

Interpretation of Results

The study generated very positive results while answering the research questions that guided the study. The results show that with the use of technology at the center, nearly 50% of the students passed the FCAT, more than double the number of students who passed the previous year. The study also found that the education technology program was achieving the desired school district goal, and the curriculum was providing the necessary technology skills to students that enabled them to pass the FCAT and graduate. The results showed that students and teachers were optimally making use of the technologies available to them and that

the school district had enough qualified and skilled technology teachers to improve the current education program. It was also found that students were attaining higher levels of technological competence.

Implications of Findings

The use of technologies and electronic media, in particular the Plato software, proved to be a powerful teaching tool. The result of the study clearly indicates the value of the use of technology in the classroom. When the Plato program was first introduced, the initial results were disappointing even though the faculty had been trained. However, in the 2nd year of the program, once faculty were better trained and more familiar with the program, the program generated much better student results. Students were able to pass all three areas of the FCAT at a significantly higher rate. Students found the Plato software very stimulating and helpful. Certainly, familiarity with the software was a key ingredient to the program success.

The Plato program was also complemented by the faculty's use other of electronic media. The faculty made more use of the Internet. The e-mail communications between faculty and students helped them to maintain a closer relationship. The students indicated that teachers were more accessible because of the e-mail between faculty and

students.

The professional development training that the faculty received the 2nd year helped the faculty to use technology more effectively. This was clearly demonstrated by the results achieved by students on the FCAT.

Limitations

The effects of extraneous variables, such as the demographic status of the students at the center, which was largely minority, might limit the internal validity. External validity would be limited as the data collection targeted 18- to 22-year-old students who attended the adult education center and took the FCAT. The adult education center was equipped with the technology necessary to implement the program. Because it was expensive to implement, the cost of implementation could be an inhibiting factor in spite of the excellent results achieved by the students who participated in the program. The information age is very vulnerable and data may be lost through transmission and data may also be corrupted. Thus, faculty may have to spend time protecting student information. There may also be information overload resulting from loss of transmission.

Recommendations

The school administration should support the increasing

prevalence of information-technology-mediated instruction through both central facilities and specialized sites throughout the school district. Technology in the classroom, whether the most advanced or not, should be adequately configured and maintained with close coordination among all parties involved. Assistance in the use of such technology should be available as needed.

All departments of the adult education center need to recognize that reliance on the use of technology requires that an increasing portion of the adult center resources be dedicated to that use. In order to assure that technology decisions recognize technology cost, a budgeting mechanism needs to be developed that allocates resources to the unit most directly responsible for the use of technology. On-site technical support should provide expertise appropriate to the individual needs of the faculty. All faculty, staff, and students should have access to the information technology resources appropriate to their needs and responsibilities. This access should be provided with a reliable network. The adult center technology department should be consistent, coherent, current, and easily accessible to all faculty, staff, and students alike.

This research has shown that a limited understanding in the use of technology and supportive electronic media can be

closed by various interventions. One of the interventions to close or solve the performance gap was the implementation of the action learning intervention. The study clearly demonstrated that faculty performance can be enhanced through rigorous training, coaching, and workshops and by using the action learning method. Performance is derived from actions learned and these actions can be motivated by rewards, compensation, and employee recognition.

The following questions were generated and unanswered in this study and are provided for further research:

1. Do the benefits derived from the program really outweigh the cost of the program?

2. Is it really true that students may be very tired after staring at the computer for 4 hours?

3. Would the FCAT results improve if students were allowed to use the Plato program at home; that is, to have access to the systems 24 hours a day?

4. What is the optimal amount of time a student should spend in one sitting interacting with computer-assisted program?

5. Is there a relationship between time spent learning using technology and fatigue or boredom diminishing the learning experience?

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Appendix A

Faculty Survey Questionnaire

TO FACULTY:

Part A

Please indicate the technology/technologies you employ within each class when teaching FCAT classes. Circle the appropriate box on the right side of the questions indicating the weight of response attached to each question: 4 being the highest and 1 being the lowest.

Questions	Always	Frequently	Seldom	Not At All
1. Overhead projector is the technology I use to teach.	4	3	2	1
2. Power Point is the technology I use to teach.	4	3	2	1
3. Movies are the technologies I use to teach.	4	3	2	1
4. Interactive video is the technology I use to teach.	4	3	2	1
5. Internet is the technology I use to teach.	4	3	2	1
6. Television is the mode of technology I use to teach.	4	3	2	1

Part B

As you review and reflect on your use of technology in your teaching, please estimate the % of classroom time you use each technology:

Overhead Projector	_____% of time
Power Point	_____% of time
Movies	_____% of time
Interactive Video	_____% of time
Internet	_____% of Time
Television	_____% of time
TOTAL SHOULD EQUAL	100 %

TO FACULTY:

Please enter in the table below answers to the questions on the left side: 5 being the highest and 1 being the lowest.

Questions	Strongly Agreed	Agreed	Neutral	Disagreed	Strongly Disagreed
7. Power Point is the technology that I would like to use more effectively in the classroom.					
8. Interactive video is the teaching technology that I would like to use more effectively in the classroom.					
9. Movies are the teaching technology that I would like to use more effectively in the classroom.					
10. Internet is the teaching technology I would like to use more effectively in the classroom.					
11. Overhead Projector is the teaching technology that I would like to use more effectively in the classroom.					
12. Television is the teaching technology That I would like to use more effectively in the classroom.					

TO FACULTY:

Please indicate Yes/No answer to the questions below.

15. Is the institution providing enough software and hardware for the use of technology in teaching? Yes No

*If NO, explain*_____

_____

_____

16. Is the institution providing enough training and coaching to enable you to use electronic media/technologies effectively? Yes No

*If NO, make suggestions*_____

_____

_____

17. Do you want the institution to provide additional funds for the training of personnel and faculty to use teaching technologies more effectively? Yes No

*If YES, make suggestions*_____

_____

_____

18. Have you ever used e-mail to communicate with your students before and after classes? Yes No

If YES, What percentage of your communications with your students is by e-mail? _____

TO FACULTY

Please indicate Yes/No answer to the questions below and explain.

19. Is the Plato computer software helping students to comprehend the reading lesson? Yes No

a) Identify strengths of Plato:

_____

_____

_____

b) Identify weaknesses of Plato:

_____

_____

_____

TO FACULTY

Please indicate Yes/No answer to the questions below and explain.

20. Is the Plato computer software helping students to comprehend the mathematics lessons? Yes No

a) Identify strengths:

_____

_____

_____

b) Identify Weaknesses:

_____

_____

_____

21. Is the Plato computer software helping? students to comprehend the science lessons? Yes No

a) Identify Strengths:

_____

_____

_____

b) Identify Weaknesses:

_____

_____

_____

Appendix B

Student Survey Questionnaire

TO STUDENTS:

Please indicate Yes/No answer to the questions

1. Does the Plato computer software improve your knowledge of understanding mathematics? Yes No

2. Does the Plato computer software improve your knowledge of understanding reading? Yes No

3. Does the Plato computer software improve your knowledge of understanding science? Yes No

4. Are all the technologies used in preparing you for FCAT helping you increase your skills? Yes No

5. Are the teachers answering all of questions concerning the use of technology? Yes No

6. Are the teachers instructing or assisting in the content area of mathematics, reading, and science? Yes No

7. Do you communicate with your teachers via e-mail? Yes No

TO STUDENTS:

Please indicate Yes/No answer to the questions

8. Do you use the video library portion of the Plato computer software to study? Yes No

9. Does the incentives offered by the center motivate you to study harder for the FCAT? Yes No

10. Do you think more technologies should be used in preparing you for FCAT? Yes No

Appendix C

Completed Evaluation Report

Summary Form

1. Is the education technology program achieving the desired school district goal, and does the curriculum provide the necessary technology skills to students that will enable them to pass the FCAT and obtain a high school diploma? YES X : NO

   Explain:

   The results show that education technology is achieving the desired school district's goal and the curriculum does provide the necessary technology skills to student that will enable them to pass the FCAT and obtain a high school diploma.

2. Does the school district have enough qualified skilled technology teachers to improve the current education program? YES X : NO

   Explain:

   The results show that the school district does have enough qualified skilled technology teachers to improve the current education program.

3. Does the school district possess the innovative technology curriculum and personnel to meet its' stated student objectives of passing the FCAT and graduating YES X : NO

Explain:

The results show that the school district possesses the innovative technology curriculum and personnel to meet its' stated student objectives of passing the FCAT and graduating.

4. Are the students and teachers optimally making use of the technologies available to them? YES X : NO

Explain:

The results show that the students and teachers are optimally making use of the technologies available to them. Faculty likes to use technology or electronic media to teach their subjects.

5. Are the students attaining higher levels of technological competence? YES X : NO

Explain:

The results show that the students are attaining higher levels of technological competence. Furthermore technology helps the student to pass FCAT.

6. What specific skills and applications need to be considered in a high-quality technology program?

Explain:

The specific skills and applications needed to be

considered in high-quality technology program is the adequate use of technology and its software and these were carefully considered.