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A COMPUTER INSTRUCTIONAL MODEL
DESIGNED TO REDUCE CYBERPHOBIA
AMONG ADULT STUDENTS

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in Education

by
Sandra Escalante

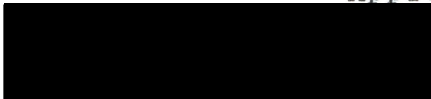
March 1993

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March 1993

Approved by:



Dr. Joseph English, Advisor
1st Reader

3/9/93
Date



Dr. Ronald Pendleton, 2nd Reader

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ABSTRACT

The purpose of this study was to develop a teaching model which considered the profile of the adult learner as well as the stated learning objectives of the course. The model was used to answer the question: "To what extent can teaching practices facilitate the mastery of computer skills by students who are experiencing feelings of cyberphobia ranging from low to high?"

A remedial teaching model was selected and based on A. Rogers' (1986) concept of student/subject-centered learning. Methods were developed which included class discussions, lectures, demonstrations, sharing of personal experiences, and hands-on practice. At the end of the course, findings indicated that 23 of the 25 students no longer feared computers, their grade point average of was 3.24, and they praised the teaching methods used.

The concluded recommendations were that computer instructors become aware of all the factors affecting adult students and implement a student/subject-centered teaching model.

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CHAPTER I
INTRODUCTION

Background

The original economic basis of the United States was agrarian. From that beginning, the country's growth has passed through several different technical revolutions and is currently becoming pro-technological. During these times of change, average citizens were expected to make major changes in their methods of thinking, learning, and working, and in their concept of the basic patterns of life.

Subordinate workers as well as management have found that they must develop higher-order skills and more cognitive understanding. Calhoun and Finch (1982) found that retraining was a part of employment, and that having a single occupation throughout one's worklife was not possible for a large portion of today's workforce. Thus, serial careers have become common.

Yet, it is humankind's nature to resist change and to fear what is new, untested, or unknown. "Since the dawn of the industrial era, there has been tension between labor and technology" (Brinkerhoff & White, 1988, p. 435). As early as 1675, weavers rioted against the looms that could replace 20 men; in 1768, a mechanized saw was destroyed by sawyers who feared for

their jobs. The most famous revolt against machinery was the Luddite uprising in England, which occurred between 1811 and 1816, and led to the hanging or deportation of those who participated in leading the rebellion. In modern times, the term "cyberphobia" has been coined to describe the dread of the computerization of society. Many new computer users and students can be considered to be fearful enough to be cyberphobic. (Webb, et al., 1987).

In spite of any resistance, technology has continued in its relentless path of change. Those who wished to enjoy continued success in the job market have had to learn to overcome their inborn fears and adjust to the paradigm of lifelong learning.

(Billington, D., 1990; Hughes & Graham, 1990; Rogers, A., 1986; Webb, et al., 1987).

Nature of the Problem

For the adult learner, fear of technology has equaled the fear of the unknown, and has retarded the development of these usable computer skills. The adult learner could remember, and perhaps long for, a simpler time when the human mind did not have to conform to the standards of a machine in order to create and produce. (Hopper & Mandell, 1987). Adult learners have often

come to the arena of computer learning with no previous skills or experience to assist them in their new learning situation. Those adults who have braved the new era and re-entered school deserve the best instruction possible.

Significance of the Problem

Therefore, the efficient computer instructor will realize that some computer knowledge is required in almost every occupation available in today's society, from entry level cashiering to top management positions. Mature workers, displaced by the technological advances which have replaced much of the physical labor previously required by their jobs, must be retrained to survive in our computer-oriented world. For our economy and cultural structure to survive and continue to progress, there is an undisputed need for workers to keep up with modern developments in technology. (Webb, 1987). Personal survival in this changing environment also depends upon the need to gain and maintain a practical knowledge of current trends in the work place. The only way to achieve this objective is through education and re-education. (Calhoun & Finch, 1982).

The instructor who trains adults in computer usage must understand the nature of the adult student and develop teaching methods that will effectively overcome any barriers to learning, such as fear of computers or apprehension about their use. At the same time these methods must facilitate the mastery of computer concepts and programs.

An informal survey of 59 beginning word processing students, whose previous computer experience ranged from none to very little, showed that 25 of these students were presently experiencing some degree of fear of computers. Their fear ranged from mild apprehension to extreme discomfort. Since over half of this group of adult learners were experiencing some manifestation of feelings which could hinder their development of computer skills, it was felt that more attention should be given to teaching methods designed to alleviate this problem. (Escalante, 1992).

Statement of the Problem

Many students experience feelings of discomfort ranging from mild apprehension to extreme fear when faced with the new challenge of learning to use computers. The instructor is therefore faced with the task of overcoming these obstacles to learning while at

the same time providing the necessary learning opportunities. This goal must be achieved while preserving the students' self-respect and dignity and achieving true proficiency, so that the student can take the skills into the work place and perform as a valuable resource to his or her organization and community.

Purpose of the Study

It is the computer instructor's duty, and primary concern, to find a teaching method which will incorporate the adult learner's views of technology, cycle of development, learning styles, and pace of learning in a manner which will facilitate the overcoming of feelings of fear, apprehension, and/or intimidation and allow the student to become as proficient as possible in the use of computer skills.

The purpose of this study was to develop a teaching model which considered the profile of the adult learner as well as the desired terminal performance.

Research Question

In preparing to use this teaching model, the following research question was developed: "To what

extent can teaching practices facilitate the mastery of computer skills by students who are experiencing feelings of cyberphobia ranging from low to high?"

Limitations

This study was limited to 25 beginning word processing students during one quarter at Phillips Junior College in Riverside, California. One instructor used the described teaching model.

Definitions

For the purposes of this thesis, the following definitions were used:

An adult student is a person who is studying at a level above high school, especially one who has spent an interim period out of school since attending high school. (Billington, 1990; Calhoun & Finch, 1982; A. Rogers, 1986).

Apprehension is an anxious feeling of foreboding or dread. Synonym: fear. (Neufeldt & Guralnik, 1991).

A computer program is a series of step-by-step instructions that tell the computer exactly what to do. (Hopper & Mandell, 1987).

A cursor is a flashing character that shows where the next typed character will appear on the computer display screen. (Hopper & Mandell, 1987).

Cyberphobia is the extreme fear of technology, particularly computers. (Webb, 1987).

DOS is the disk operating system, a program that tells the computer how to read and execute commands. (Hopper & Mandell, 1987).

Fear is a feeling of timidity, dread, terror, fright, or apprehension; a respectful dread, awe; or reverence; a feeling of uneasiness or apprehension. Synonym: apprehension. (Neufeldt & Guralnik, 1991).

Hardware is the actual machinery part of the computer -- the computer itself, the monitor, the keyboard, and the printer. (Hopper & Mandell, 1987).

Lifelong learning is the concept that one never stops learning new skills or forming new ideas and opinions, regardless of one's chronological age. (Billington, 1990; A. Rogers, 1986).

Paradigm is a word used to describe the theories and practices accepted by a particular field of study or practice. (Kuhn, 1970).

Software refers to all the programs used in the computer; the program commands are on floppy (soft) disks. (Hopper & Mandell, 1987).

Technology is the result of technical progress in the use of machinery and automation in industry, agriculture, and other areas of human endeavor. (Hopper & Mandell, 1987).

WordPerfect is a commonly used word processing program.

Word processing is the production of documents such as letters and reports with a computer. (Hopper & Mandell, 1987).

CHAPTER II

REVIEW OF LITERATURE

Views of Technology

Brown (1991) suggested that people view technology in four different ways. The most common view among the public was that technology was the latest in gadgets, toys, tools, and devices. The second view regarded technology as a process or system used to solve problems and meet needs. A third view defined technology as vague concepts discovered by applied scientists, engineers, and technicians as they developed new products and processes. The fourth view saw technology as a force constantly exerting more control and direction on our society.

Many employees have found that management has gained more control over the production process by being able to keep thorough and complex records on employees, inventory, and production. As employees became concerned about the controlling function of technology, "mental stress and health problems related to such work environments are paramount problems for personnel administration" (Webb, et al., 1987). Since work is the "major means that most of us use to structure our lives" (Brinkerhoff & White, 1988,

p. 431), these employee concerns and feelings of being controlled rather than controlling have been known to lead to job alienation. As defined by Marx, alienation causes a feeling of estrangement from the work process and its products, as the workers become merely instruments of labor. (Brinkerhoff & White, 1988).

Thus, part of the vocational instructor's job, and challenge, has become addressing and helping the adult student overcome the controlling aspects of technology. The feelings of fear and powerlessness must be replaced with confidence and empowerment if the student is to become a productive part of this technological revolution.

The instructor must decide why students are taking the class and what long-term benefits they should gain from the course. "The study of technology must have focus," and the students must be encouraged to ask questions, think creatively, and interact effectively in groups. "These are the skills needed to succeed in the technological future" (Brown, 1991, p. 101).

The Adult Learner

Millions of adults are currently enrolled in colleges and universities and billions of dollars are spent annually by private employers and government for

adult training. "In 1983 there were more people over sixty-five in America than there were teen-agers. And, by 1992, half of all college students will be over twenty-five and 25 percent will be over thirty-five" (Viechnicki, et al, 1990, p. 10). This is an "unprecedented demand for effective adult education as the rapid proliferation of knowledge in our technological world makes continuous lifelong learning imperative" (Billington, 1990, p. 31). Yet, until very recently, research focused on child, not adult, development.

The modern paradigm finds it unrealistic to believe that learning follows a chronological pattern. We do not stop learning at a particular age, pursue a career, and retire. Learning begins at birth and continues until old age; it is not unusual to have two or more careers during a lifetime. Neugarten (1980) discussed how adults must change as their lives are changed by technology: "Chronological age is becoming a poorer and poorer predictor of the way people live. An adult's age no longer tells you anything about that person's economic or marital status, style of life, or health. Somewhere after the first twenty years, age falls away as a predictor...Lives are more fluid. There's no longer a particular year -- or even a

particular decade -- in which one marries or enters the labor market or goes to school or has children" (p. 66).

In a study by Hughes & Graham (1990), the adults who were interviewed indicated that they felt they were at different levels of achievement in each of six life roles (relationship with self, work, friends, community members, partners, and parents). Adults were observed to move in and out of different life roles at different times, depending on what experiences and events are occurring. Movement through each cycle consisted of the four phases of initiation, adaptation, reassessment, and reconciliation. As individual adults progressed in a new endeavor, they emerged from total self-centeredness to being able to empathize with others and then to relate harmoniously with others. "People at a particular stage of ego development perceive and interpret events in terms that are appropriate to that stage" (Billington, 1990, p. 32). An adult who had newly become a student or who was beginning to learn a new subject passed through these four stages. During the initiation stage, the adult learner practiced individualized learning and assumed the tasks and expectations for the new role being attempted. In adaptation, the learner assimilated and adjusted to

those behaviors which were expected and required in the new role. In the reassessment phase, the adult learner strove to find personal relevance and meaning in the involvement in the new role. In the final phase, reconciliation, the adult reflected on the aspects of the life role and considered a lessening of involvement with it. An adult who had participated in the family life role through early adulthood and then engaged in the returning student role would be advanced in the family life stages, but would be in the initiation stage of being a student.

Adults may re-experience the same life role in a new context. For instance, when adult students moved from one community to another, they had to return to the initiation stage of establishing new friendships and associations. This initiation stage would carry over to entering a new institution of learning: these students encountered new schedules, new course descriptions, new instructors, and new surroundings. This "re-cycling phenomena would occur whenever adults re-engage in a life role previously experienced" (Hughes & Graham, 1990, p.3).

According to Argyris' continuum of developmental characteristics each time an adult began to learn a new concept or process, he or she passed through the

infancy stage of development. Passive, dependent, immature traits surfaced at this time. As the student became more acquainted with the new situation, he or she became more adult, taking an active, independent, more mature attitude toward the subject. Instead of having a casual, short-term interest, the adult learner now had a more serious, long-term concern, and showed expertise and confidence as self-awareness and control were expressed in the new area of study. (Frunzi & Savini, 1992).

If the computer instructor is aware of this continuum, student apprehension can be alleviated from the beginning of the course term and students can be helped to progress more easily from the infancy stage to the adult stage of learning. The students can be shown from the beginning that they are capable of making this transition without undue stress.

The instructor must also remember that "at any point in time adults are in variable phases of development across their life roles" (Hughes & Graham, 1990, p. 4). While some adults have stayed away from education since childhood or high school, others have continued to use, in one way or another, their talent for education. (A. Rogers, 1986). It is therefore inappropriate for the instructor to treat students as

children simply because they are in the initiation stage of learning a new subject. Students should be treated with the dignity that their status in other life roles indicates, while still being given the consideration of their beginning stage in the subject being learned. Contrary to traditional studies which indicate that one's ego level is relatively stable in adulthood, recent studies have indicated that "change can be stimulated through the influence of an exceptional teacher who can provide the unusual circumstances for adult growth much as a parent does for a child" (Billington, 1990, p 32).

Hughes & Graham suggested that adult students be given short workshops which would help them identify previously learned skills which will help them in the new learning situation. Rather than assuming that adults who engage in education have a high level of maturity in directing their own learning, instructors in this study became aware that, though adults may be advanced in other aspects of their life, they may be in the early phases of development as they begin a new course of study. The adults students still evidenced a deep need to be self-directing; by identifying, valuing, and utilizing their individual experience, the instructors helped them learn to be effectively self-

directed. Understanding the life role approach helped the instructor avoid placing unrealistic expectations on adult students, especially those who had just returned to school, and who had in the past been conditioned to be passive, dependent students.

(Billington, 1990).

C. R. Rogers (1969) felt that higher education should focus on facilitation of self-directed learning, rather than on teaching -- that the development of the individual should be the goal of education. Optimal learning would occur under independent study and tutorials, making learning exciting, instead of a process of memorizing facts which would be forgotten after the test was taken. Rogers found that current methods of teaching adults could be not only ineffective, but destructive.

Billington's (1990) study indicated "that adults can and do experience significant personal growth at midlife. A striking finding was that students tended to experience growth only within the non-authoritarian environment that emphasized self-directed learning, support, mutual trust, and respect" (p. 35). In the study, students who were interviewed indicated that growth was facilitated by the fostering of a self-directed learning environment which included an

atmosphere of acceptance and unconditional positive regard where feedback provided the feeling of safety which allowed the adult student to explore new areas of thinking and progress to a higher developmental level.

Adults have developed a natural learning process, which helps them in obtaining everyday goals.

Throughout their lives, they have had to attend to various learning tasks, at home or on the job. These self-directed learning activities were usually episodic in character, rather than continuous, and had a goal set in some immediate problem that seemed to be important. They were not pursued in a systematic, classroom-oriented way; the learners did not draw on compartmentalized knowledge, but brought all that they knew from all sorts of fields to the immediate learning situation; and the learning episodes were aimed at immediate application to solve a particular, current need. (A. Rogers, 1986).

Learning Styles

In addition to the natural learning style, each person has been found to have a particular learning style, which began to develop through childhood and which has emerged into an individually characteristic way of learning. Each learning style discovered

contained a mixture of preferences and affected how the student learned and remembered. By the time the instructor encountered the adult student, that student had a fully developed style, gained through experience. (Kanar, 1991; Pearlman, 1991). A large number of models for learning styles exist; two basic ways of distinguishing styles are discussed here:

Sensory Learning Styles

Many students found they had a dominant sense when it came to learning. Recognizing the different learning styles and using different teaching methods benefited almost all students in the classroom and produced enthusiasm about learning. (Flaherty, 1992; Kanar, 1991; Pearlman, 1991).

Visual learners learned best by reading or watching and were easily distracted by visual disturbances that might not bother other learners, such as the clothes the instructor was wearing. Since most classrooms are set up to accommodate them, they were the ones most likely to do well. (Flaherty, 1992). These students profited from demonstrations where they could observe the learning process. They liked to see everything in print and used and understood overheads, handouts, books, and papers. Videos were a great help

to these students. They did their best on written tests and reports. The visual learner who was enrolled in a class in which instruction was by lecture and demonstration, followed by hands-on activity, gained more from the demonstration. He or she also needed to be reminded to take notes, so there would be something to look at the next time the computer was used. (Kanar, 1991).

Kinesthetic learners learned best by doing, actually touching or manipulating objects or equipment. They were less likely to read for pleasure than the other types of learners, preferring "to do something first and read about it later" (Flaherty, 1992, p. 32). These students showed a talent for hands-on learning and were often poor test takers, even though they seemed to know the material.

Tactual learners were those who had a sensitive awareness of everything around them. They were the ones who complained about the temperature of the room and were adept at interpreting non-verbal communications. They were the students who could read the teacher's mood and, in touch with everyone in the school, they knew who was dating whom. Tactual learners needed to like the teacher in order to learn cognitively; they "are overwhelmed with their inability

to connect with people, so they need special attention and an environment that is warm, welcoming, comfortable, and caring" (Flaherty, 1992, p. 33).

Auditory learners needed to hear and liked listening to lectures and tapes. They were noisy; they talked, regardless of the rules, and often needed to read aloud to comprehend the written material. They had trouble with timed tests because they read for comprehension rather than speed. Auditory students benefited from small group discussions where they could "compare ideas and learn by saying what they think and, especially, hearing what they say, how they sound and how they come across to teachers and other students" (Flaherty, 1992, p. 33).

In the computer classroom, the visual learner wanted to read the manual or watch someone demonstrate how to use the computer or the computer program. The kinesthetic learners wanted to boot up the computer and start using it right away. The auditory learner needed to listen while the instructor explained the directions. The tactual learner at first complained about the ergonomics of the workstation and made adjustments before settling down to work.

Thinking Styles

Students also differed in their methods of thinking. Some were global thinkers, while other were analytic. Analytic thinkers used inductive reasoning and wanted to see specific details going from the part to the whole. Global thinkers (deductive reasoners) "need to see the big picture first, so they can place details in context" (Pearlman, 1991, p. 7).

In addition to these two major ways of viewing learning styles, each student's pace of learning also varied. If adult students had some life or educational experience in the subject being studied and the new material was not in conflict with their existing knowledge, they learned even faster than younger people. However, "where they have less experience on which to fasten the new material -- languages, for example, or computer studies -- especially if it calls for extensive memorizing, they tend to learn more slowly and have greater difficulty in mastering the material than their younger counterparts" (A. Rogers, 1986, p. 34).

The students whose learning patterns did not match the instructor's teaching patterns became frustrated, and found it more difficult to master the material presented than if the learning and teaching patterns

agreed. (Kanar, 1991). Just as important as keeping curriculum up to date, using methods that best fit the learning styles and preferences of the students was found to be an important ingredient in classroom success. (Christensen, 1992).

The Instructor

The instructor's job was defined as "to promote desired changes through planning and instruction. The easiest change is to make a person more knowledgeable. It is more difficult to get students to translate their knowledge into new competencies and skills" (Hargrove, 1984, p. 9). The professional teacher was deemed accountable for the effectiveness of teaching -- the amount and quality of learning which takes place.

..."the teacher may promote or diminish the motivation of the student participants....We forget that initial motivation to learn may be weak and can die; alternatively it can be increased and directed into new channels. This is part of the task of the teacher" (A. Rogers, 1986, p. 61).

Hargrove (1984) felt that, ideally, the instructor would know everything about each student which might affect the learning experience. Academic achievements, health status, family background, previous work

experience, abilities and aptitudes, and recreational activities were given as sources for clues to the instructor about each student. While most instructors were found to not have time for such an extensive research of each student's characteristics, many have found that they can sharpen their own observation of students. Just by listening to students' comments, instructors gained some insight into the rate and depth of learning that would take place in a particular classroom.

It has been found that the effective instructor must take responsibility in the motivation process. While some motivation factors were considered intrinsic to the student, many were extrinsic and provided by the learning environment. When the basic physiological needs of students were first taken into consideration, the true process of learning could begin. When instructors were aware of Maslow's theory of need-related motivation, they realized that the students' needs for comfort, safety, and socialization, if not met, would override their need to learn. In addition, instructors were urged to keep in mind that students come to the classroom with a mixture of different stages and levels of need. (Frunzi & Savini, 1992; A. Rogers, 1986).

C. R. Rogers (1984) stated that instructors should not rely just on the student's original motivation, but make an attempt to build new types of motivation which relate to the subject matter itself. How the instructor viewed the adult student had a deep impact on how the learning situation developed.

If the instructor, consciously or unconsciously, employed McGregor's X-Y theory, the motivational atmosphere of the classroom was affected. The X theory assumes that the average human being is lazy, dislikes work, and will avoid it if possible; that people must be coerced, controlled, directed, and threatened with punishment to get them to put forth enough effort to achieve even minimum goals; and that the average human being avoids responsibility, has little ambition, and wishes to be directed. The Y theory assumes that work is as natural to the average human as play or rest; that workers will exercise self-direction and self-control to obtain objectives; that commitment to objectives is part of the reward of work; that the average person will learn and seek responsibility; that people have the capacity to be self directing; and that most people are capable of a high intelligence potential.

Realistic instructors realized that most people occupy a middle ground between these two theories, a combination of the foregoing characteristics that may change from time to time and situation to situation. (Frunzi & Santini, 1992). The most capable instructors took into account the learning and thinking styles of the adult students. For these students, success was extremely important, as they were often making their first attempt at lifelong learning, or their last try at improving their lifestyles. Each student who did not succeed affected the overall economy and was doomed to the restrictions of limited thinking. (A. Rogers, 1986).

Teaching Styles

A. Rogers (1986) also stated that there were three elements to the presentation of material. If the content was emphasized and a set amount of material covered, the learning was subject-centered. If the material was presented by teacher performance only, for example lectures without questions, the learning was teacher-centered. If the emphasis was on methods and processes of learning and on how the students would handle the material on their own, the learning was student-centered. Rogers identified a need to adopt

varied approaches, and suggested that combined methods, such as subject/student-centered, would often be the most effective.

Bilderback (1992) and A. Rogers (1986) both found that the careful instructor guarded against overestimating the amount of input needed for each class session. For example, giving students too much information at one time or judging student capacity by the instructor's own capacity was found to be harmful to the learning process. The instructors learned to remember that they also had to engage in a learning process at one time and to beware of putting undue pressure on the student-learner. Teachers learned the responsibility of setting the pace of learning by considering the amount of material they had to present against the abilities and commitments of the learners, rather than against the time they had in which to teach.

Learning experts have discovered that the instructor should guard against too much authoritarianism, which can be a great obstacle to adult learning. Authoritarianism results from a teacher-oriented classroom and can be partially overcome by using such statements as, "I think you should do this," rather than, "Do this." It was found

that the teacher must be sensitive to the needs, intentions, attitudes, and learning styles of the whole group when deciding the balance between asserting authority and encouraging individual or group dynamics. (Flaherty, 1992; Viechnicki et al, 1990).

"Educators who design instructional strategies need to see the educational system from the perspective of people who move through it" (Viechnicki, et al., 1990, p. 10). Since adult learners usually enter the system voluntarily, it has been deemed necessary to know what attracted them to the classroom and what will facilitate a positive learning environment for them. Viechnicki, et al (1990) stated that there are four requirements which produce a motivational outcome in the adult student:

1. Gaining and maintaining the learner's attention.
2. Having the student perceive that the instruction meets significant personal needs.
3. Cultivating confidence in the student, which creates an attitude that influences later performance.
4. Providing individual satisfaction.

For adults, learning usually had a definite purpose -- it was a means to an end. They felt the

need to be interested in the subject and to have a use for what was being taught. They needed to feel competent and at ease in the learning environment. The adult learners had a need to learn at their own pace and utilize their particular learning styles, putting their own structure on the classroom situation. When learners were satisfied, they felt involved and challenged. They had a feeling of safety and enjoyed feeling self-directed and being rewarded for their efforts. They felt they could ask questions and make mistakes. (Flaherty, 1992; Kanar, 1991; Pearlman, D., 1991; A. Rogers, 1986; Viechnicki, et al., 1990).

"The problem I encounter with adult learners is intimidation and fear regarding the use of computers" (Bilderback, 1992, p. 34). Students had to feel physically and mentally comfortable with the equipment. (Bilderback, 1992; Kanar, 1991; A. Rogers, 1986). Bilderback emphasized that adults had an unrealistically high expectation of what they should accomplish and needed to continually be reminded that they could not expect themselves to remember everything they were told without practice. She also stressed that students needed to feel some degree of success with a software program as soon as possible, even before they had actually learned all about the program.

In addition, the instructor had to remember that many adult students also worked full or part time and had family responsibilities, so they were often tired when they came to class; the use of humor and patience could make the class more enjoyable and productive.

In an informal, ethnographic interview process, 59 beginning word processing students were asked as their first assignment to write a memo to the instructor about their feelings toward computers and what traits they felt an instructor needed in order to help them learn computers. Approximately half felt intimidated or frightened by computers; the other half had at one time felt discomfort ranging from apprehension to fear when faced with learning computer programs. Three-fourths of the students stated that the main trait instructors need is patience; a good sense of humor was the second most often mentioned characteristic. (Escalante, 1992).

Bilderback has used real-life experiences to implement learning in the computer classroom. In class she has compared learning to use a computer to learning how to drive: "For some, it comes easy. For others, it takes longer and involves more stress" (p. 57). She then had the students consider the value of learning how to drive and compare that experience with the worth

of learning how to use a computer. She also shared stories of her own days of adult learning, when she returned to school and used a computer for the first time. (Bilderback, 1992).

Summary

The instructor must consider adult learners as unique students, with particular goals, individualized learning styles and patterns, and a magnitude of life experiences. It is not enough to just present the course material; the material must be presented with the intention of ensuring that learning actually takes place. (Bilderback, 1992; Billington, 1990; A. Rogers, 1986; Viechnicki, et al., 1990).

By being aware of the variety of learning styles and methods of thinking which students may be using, the instructor can develop lesson plans which will accommodate all of these styles and methods, so that each student can have the opportunity to learn efficiently. Instructors can vary teaching styles from day to day, or incorporate different styles into each lesson. An instructor who is aware of motivational factors is more likely to provide external motivation and stimulate internal motivation. This approach encourages the attainment of usable knowledge, rather

than the rote memorization of facts. (Kanar, 1991; Pearlman, 1991; A. Rogers, 1986). Finally, as Bilderback stated, the instructor must learn to give of him or herself, sharing past experiences and present concerns.

CHAPTER III

RESEARCH DESIGN AND PROCEDURES

Population Sample and Description

The study was performed at Phillips Junior College, a private vocational college which awards certificates and associate degrees. Total student body is approximately 490 students.

The population sample (n=25) was a group of 25 beginning word processing students, using the software program WORDPERFECT 5.1. (WordPerfect, 1990). Some of the students had taken an introduction to computers course; some had not. All of them had some typing ability.

The students were all adults, none of whom had come straight to college from high school; all had high school diplomas or the equivalent. They ranged in age from 20 to 55 years. Approximately two-thirds of the students were women; one-third were men.

The Survey

On the first day of beginning word processing class, an overhead projector connected to the instructor's computer was used to demonstrate the basic principles of word processing. Students were given

time to experiment with typing on the computer and to learn how to control the cursor. Students were then asked to word process a memorandum to the instructor which explained their past computer experience; their current feelings, including level of fear, towards computers; and what instructor traits and teaching methods they felt would help them overcome any problems they had with learning computers. (See Appendix A.)

In this ethnographic survey, 25 of 59 students who wrote memos responded that they were presently feeling some degree of fear or apprehension toward computers. Of the 25, one felt a low degree of fear, 13 expressed feeling a moderate fear of computers, and 11 felt that their fear level was high. (See Table 1).

	FEAR LEVEL		
	Low	Moderate	High
NUMBER OF STUDENTS	1	13	11

Table 1. Disbursement of students by fear level at beginning of study.

Students expressed the following reasons for their apprehensive feelings about computers:

1. A lack of control over the computer and its functions and the resulting frustration of not being able to accomplish desired results.
2. The possibility of losing data.
3. The idea that they might break the computer by using it improperly.
4. Appearing stupid because of not being able to grasp concepts quickly.

When answering the question about what an instructor could do to facilitate the learning process and help overcome fears, the students stated that the following traits were highly desirable in an instructor:

1. Patience (the most often-mentioned attribute).
2. An understanding of individual abilities and individual learning speed.
3. The ability to make learning computers fun and exciting.
4. Providing an abundance of hands-on experience, with individualized instruction and assistance.

5. The ability to be reassuring and to convince students that they cannot harm the computers or make mistakes that cannot be corrected.

A Teaching Model

A model for teaching word processing to beginning students who had little or no knowledge of computers was developed, following A. Rogers' (1986) model of relative effectiveness of various teaching methods. (See Figure 1.)

Rogers' model showed that those methods which were teacher-centered, such as lecturing, were least effective. However, when the lecture was interspersed with questions and discussion from the students, it became student-centered and the effectiveness jumped from a rank of 2 (which was the lowest) to a rank of 6 (which was the highest). When a subject-centered method, such as a textbook or learning program, was used, the effectiveness ranking was at 4, but if the teacher and subject were combined, with the instructor using the text or learning program to teach, the rank increased to 5. Those methods which combined student and subject matter (e.g. research and discovery learning) also had an increased rank of 5. Methods which were completely student-centered were always

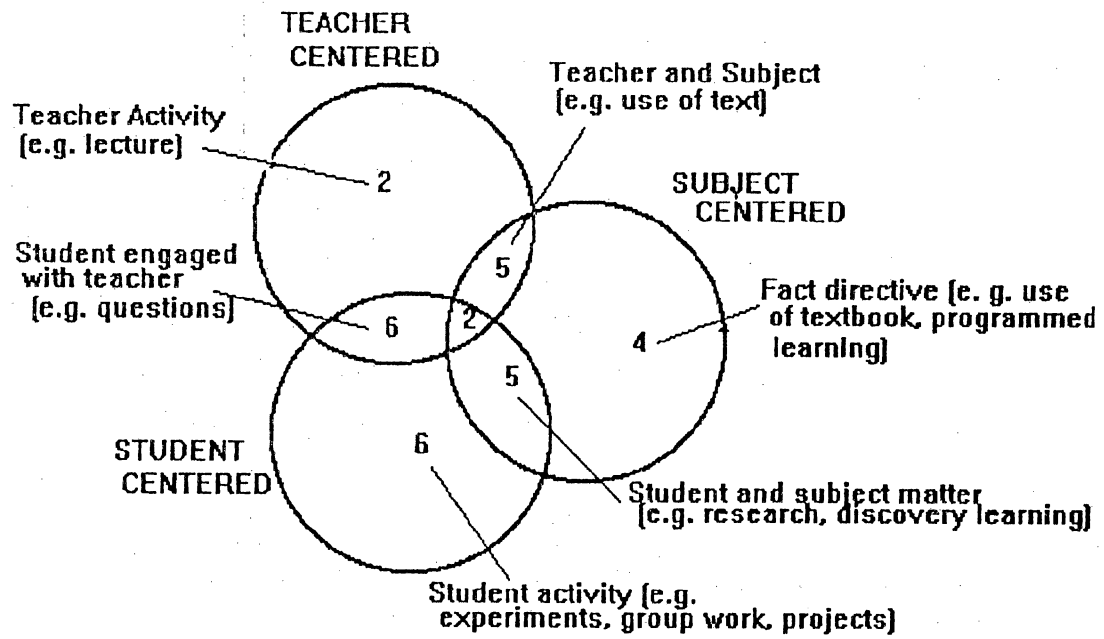


Figure 1. Teaching methods and their relative effectiveness, with the number 6 indicating high and 2 indicating low.

[A. Rogers, 1986, p. 138].

highest in effectiveness, with a rank of 6; these were the methods which involved students directly in experiments, group work, and projects.

Teaching Methods Used in Study

The following activities were developed to utilize a student-subject-centered program:

1. Class discussions which involved the students in determining exactly what computers can and cannot do. (See Appendix C).
2. Lectures which explained clearly, in plain language, how computers process data and perform calculating functions. (See Appendix D).
3. Sharing the instructor's personal experiences in learning about computers, anecdotes and stories about experiences with computers, and examples of how computers can confound and intimidate even experienced users.
4. Demonstration by instructor and students, with the assistance of an overhead projector.
5. Hands-on practice with individualized instruction.

These teaching methods were used throughout the summer quarter. Students were made aware of the

instructor's interest in their success. They were asked for their opinions about the computers. They were encouraged to share what they learned with one another and to experiment with the commands they were learning.

Individualized instruction was emphasized. Lectures were short, and centered around demonstrations on the overhead projector. After the lecture/demonstration, the instructor went from student to student, giving praise and encouragement, asking how "things were going," checking for problems, and giving individualized instruction on whatever students were working on. Students were allowed to work at their own pace, but were not allowed to fall far behind in their work.

The instructor was careful to let students see that she, too, could have problems with computers, but that all problems could be worked into a suitable solution.

Students were encouraged to care for their physical needs by taking breaks to avoid eye strain and back aches. Students who were showing high frustration levels were invited into a conversation about an unrelated subject or diverted in some other way, so that they could return to the computer refreshed.

The instructor maintained a sense of humor, helping students to laugh as often as possible.

Altogether, a learning environment was created in which students received as much knowledge as possible, as painlessly as possible. The instructor's main goal was to provide an atmosphere that was as student-centered as possible, while still being subject-centered enough for the necessary skills to be learned.

CHAPTER IV
FINDINGS AND DISCUSSION

End-of-Quarter Results

At the end of the course, the 25 students were asked to word process another memo, this time discussing what type of fear they still felt, and what, if anything, had helped them overcome their fear. (See Appendix B.) Two of the 25 who originally felt a high degree of apprehension still felt moderate fear. Those who had experienced moderate-to-low fear stated that they now had no fear of computers. Therefore, 23 of 25 students had completely overcome their fear of computers, and the other 2 had reduced their level of apprehension. This was a 92 percent rate of success, even if only the results of those who no longer felt any degree of fear was considered. (See Table 2).

		LEVEL OF FEAR	
		None	Moderate
NUMBER OF STUDENTS		23	2

Table 2. Disbursement of students by fear level at end of study.

The students (n =25) made the following grades:

GRADE EARNED	FEAR LEVEL		
	Low	Moderate	High
A	1	5	6
B	0	3	2
C	0	4	3
D	0	1	0
F	0	0	0

Table 3. Disbursement of grades by fear level.

The high grade point average (3.24 or B+) indicated that using student and student-subject teaching methods could help students overcome fear of computers and facilitate their learning of the skills necessary to succeed in becoming computer proficient.

Student Evaluations of Course

Because students are the best judges of what has actually been learned and what techniques were of the

most help to them, the following student comments, made at the end of the study, are quoted:

"One of the reasons that I am not so frightened of the computer is because my first time on working with the computer, I had a wonderful instructor who took the extra time to help me understand. She helped me to be positive and I thank her."

"The reason that I had fear in the computers was because a teacher that I had in high school said that the computers had a lot of very delicate sensors in them and if you used the computers too much that you could override the memory and that all documents would be lost, so it kind of made me a bit nervous and at the same time interested. But then I came to Phillips college and met Mrs. Escalante and she reassured me that computers are great. Thank you!"

"My instructor is an excellent teacher and I don't think they can find another teacher like her. She is the kind of teacher that goes step-by-step to make sure you have everything down and also makes sure you understand it before she continues. To say so myself, Mrs. Escalante doesn't have to change a thing"

"At Phillips College I have experienced an instructor who really cares if students comprehend the material. It is nice to know that when everyone is so

busy these days, someone still cares and will take time to help. This instructor takes the time to check all the students' work and assists them when necessary and is of great assistance!" (Escalante, 1992).

CHAPTER V

CONCLUSIONS

The following conclusions were derived from the data analysis:

Having students who expressed deep concerns about the word processing course at the beginning of the summer quarter earn grades which averaged B+ has clearly shown the value of implementing the teaching model and methods described in the foregoing chapters. The goal of teaching subject skills was clearly achieved.

Even more important is the change in student attitude, as expressed by the students themselves. Twenty-three of the 25 students studied reported no longer experiencing any fear of computers. Thus, the goal of student-centered teaching, which involves the psychological and physical needs of the student, was also achieved.

The ethnographic nature of the study gave students the opportunity to judge its success. The fact that students wrote of their pleasure with the outcome of the course was a strong testimony to the wisdom of adopting a student/subject-based method of teaching in order to reduce fear as well as teach computer skills.

RECOMMENDATIONS

Students who achieve success in their first computer courses are more likely to take other courses and learn additional programs.

An instructor's first goal should be the success of his or her students. Seeing students learn skills which improve their lives is a tremendous reward for the relatively small amount of work it takes to make a classroom student-centered.

In addition, students placed in the work force reflect upon the institutions they have attended. If, by using these teaching methods in the computer classroom, we can send out students who are above average in their work performance, we are making a strong, positive statement about our ability as a college.

It is recommended that computer instructors make themselves aware of the factors involved in adult learning and implement these suggestions into their teaching styles. Creating a more capable workforce is a tremendously important contribution to our society.

APPENDIX A

MEMORANDUM

TO: Mrs. Escalante
FROM: (Student Name)
DATE: (Today's Date)
SUBJECT: My Feelings About Computers

Answer these questions in two or three paragraphs:

1. What experience have you had with computers?
2. What are your feelings toward computers? If you have fear, at what level would you rate your fear -- high, moderate, or low?
3. What could an instructor do to help you overcome any problems you have with computers?

APPENDIX B

MEMORANDUM

TO: Mrs. Escalante
FROM: (Student Name)
DATE: (Today's Date)
SUBJECT: Post-course Feelings About Computers

In two or three paragraphs, please answer the following questions:

1. Having completed the word processing course, how do you now rate your feelings of fear about computers (low, moderate, or high)?
2. If your fear level has decreased, what reason can you give?
3. If your fear level has remained the same or increased, why?

APPENDIX C

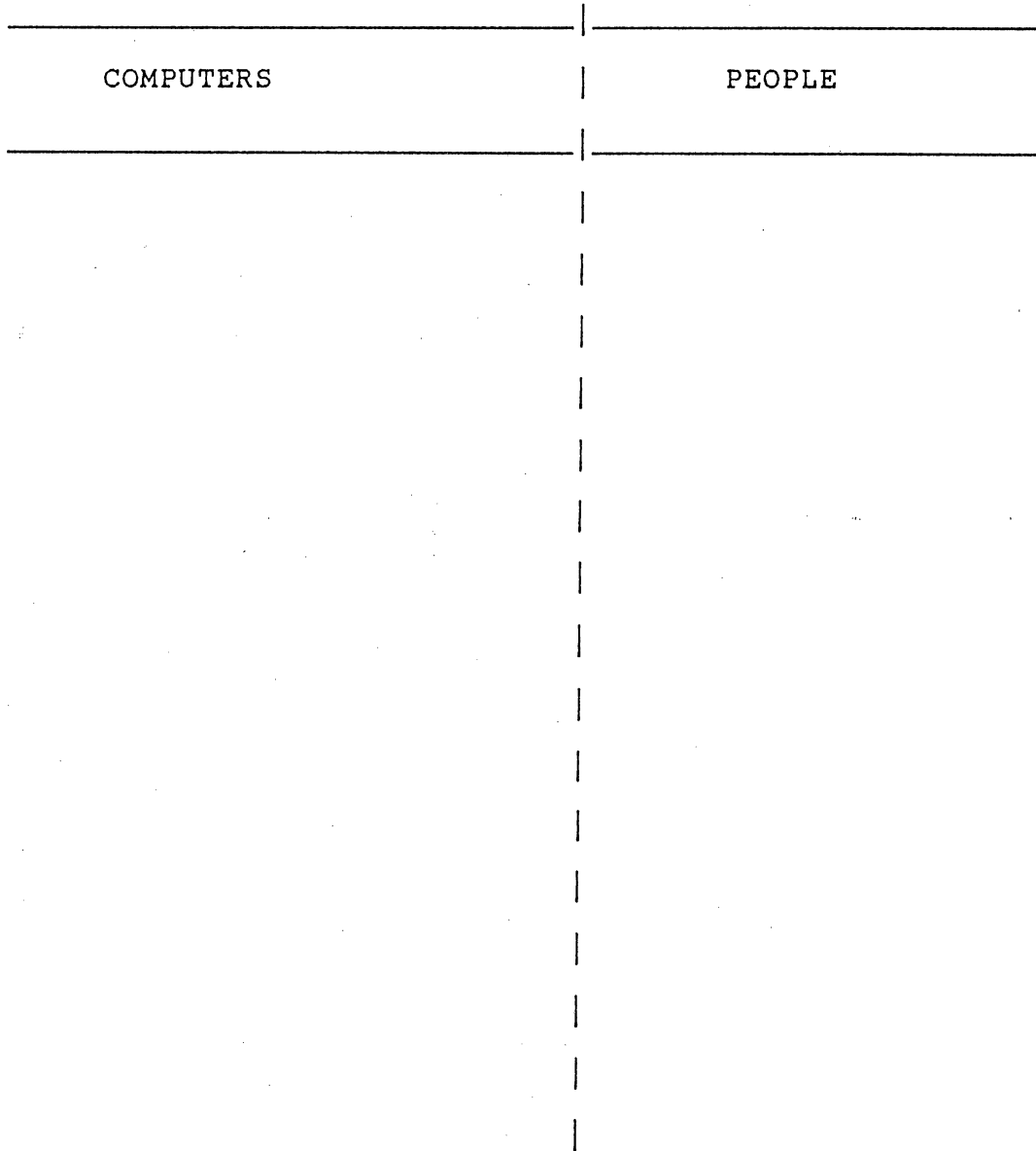
LESSON PLAN

INTRODUCTION TO COMPUTERS

Objective: Put to rest student fears that computers are smarter than humans and that they may not be able to learn how to use them.

Supplies: Chalkboard and chalk
Computer for each student
Copy of shareware program "Amy's First Primer," (Robinson, 1988) or another piece of shareware that can be easily used by someone with no experience.
Disk should include a batch file that will easily access the program.

Procedure: 1. Draw diagram on board:



2. Ask students to start giving one-word descriptions of what computers and people can do. The students usually start by stating that computers are "smart,"

and that they "think better than people." Guide the discussion into what thinking consists of, encouraging the students until they realize that computers can only calculate, and that human beings, not machines are capable of thinking. Explain how computers can only work with what human beings have input into them.

Explain that computers are either "on" or "off," and that humans always have the option of turning them off.

3. Using simple explanations, have students boot the computers and insert the floppy disks with the shareware program. Have them type in the batch command to start the program. Give basic instructions and then have the students play with the program to see how it can be used to help children have fun learning. Adult students will also have fun using the program, as it has imaginative learning games. As they "play" with this program, they will be unconsciously learning the concept of cursor movement and command control of the computer. Emphasize that they are already using the computer.

LESSON PLAN

BEGINNING WORD PROCESSING (WORDPERFECT)

Objective: To show students that they are capable of entering the WordPerfect program, typing a document, saving it, and printing it -- all in the very first class session.

Supplies: Computers for each student; overhead project attached to instructor's computer.

Formatted floppy disk for each student.

Procedure: Have students boot up their computers. Explain how to enter the WordPerfect program and have them do so.

Turn on the overhead projector and have the students type two or three lines onto their screens while you type on yours. Tell them not to worry about errors as they type; make some errors in your typing.

Use the screen to demonstrate how to move the cursor around in the document and how to correct errors. Have the students practice on their own.

Instruct the students to type another paragraph and practice moving through the document and correcting errors.

LEAVE THE ROOM FOR TEN MINUTES.

When you return, ask for questions and comments. Usually students will be enthused at this point and eager to comment on the new skills they have already developed.

Have the students type a memo to you with the subject of "Cyberphobia."

Explain that cyberphobia is a new term coined to explain the fear of computers.

The memo should include two paragraphs -
- one to tell you about their feelings and past experiences toward computers, and one to tell you what you as an instructor can do to help them overcome

any apprehension they feel and to help them become competent computer users.

As each student finishes the memo, explain how to print. Be sure each student successfully completes a printed document. Allow time, if possible, for comments; students will be excited about the fact that they have already word processed a document.

(Escalante, 1992)

APPENDIX D

SAMPLE LECTURE

HOW COMPUTERS CHANGE DATA INTO INFORMATION

Computers change data (raw facts) into information (meaningful knowledge which can be used in decision-making). This transformation from data to information, called Electronic Data Processing (EDP), involves the flow from input to processing to output.

Input is simply putting the data into the computer. For instance, a white male, known only as J. Smith, who is about 35 years old, has a tattoo on his left forearm, and has no known address, is seen committing a violent crime. Based on these raw facts, it would seem impossible to find this suspect.

However, a computer program called CNI (Central Name Index) has been written in a computer language and installed in the computers of every local law enforcement agency. Daily, facts about each person arrested or suspected of a crime are entered into this program, creating a huge data base.

To find J. Smith, a few raw facts are entered onto the CNI computer screen through an input device, which is usually a keyboard very similar to a typewriter's keyboard. "Smith" is entered as the last name and the initial "J" is entered for the first name. Then, in

the appropriate spaces, the age of 35 and the letters "WMA" (White Male Adult) are typed in. Next, the "Sound Alike" command button is pushed, telling the computer to look for every name in its data bank that could possibly be considered as a suspect.

Now begins the processing segment of the search for useful information. The internal structure of the computer includes a Central Processing Unit (CPU). The CPU consists of a Control Unit, an Arithmetic/Logic Unit (ALU), and a Storage Unit. The Control Unit oversees the entire functioning of the computer system, making sure that the commands inputted go to the right place and are properly handled. The Control Unit now sends the inputted data to the ALU, where it is classified, sorted, and summarized.

First, the ALU must go into the Storage Unit and retrieve the necessary data to classify. All of the Smiths that have been entered into the data bank, and any variations of the spelling of Smith, are found. Then the Arithmetic/Logic Unit finds all those Smiths whose first names begin with the letter "J". Next, all those who are 33 to 37 years old (to include anyone around the age of 35) are found. Finally, all who fit these particulars and are also white and male are found. When this classification is completed, the

names are sorted alphabetically, first by the different spellings of "Smith", then by first names. A summarized list is prepared, showing all J. Smiths with their full first names and dates of birth in a numbered sequence. The computer has completed the processing stage of EDP, retrieving, classifying, sorting, and summarizing data.

In the first stage of the output portion of EDP, this list of names is presented on the computer's monitor screen, which is similar to a television screen. The numbers of the most likely suspects are entered through the keyboard. The monitor screen now shows the final output--a complete description of each particular J. Smith chosen, including tattoos and/or scars; past criminal record; last known address and previous addresses; "responsible person" (relative, spouse, or friend); methods of operation; gang affiliations; and whether or not he has an active warrant for another crime. At this point, it can be determined by comparing the tattoo descriptions on the screen, as well as the general descriptions, which J. Smith is the most likely suspect and where he might be found. The computer can now be directed, by the pushing of the proper command key, to relay this information to the printer, another output device. The

printer makes a copy of the information on paper, so that it can be easily carried and referred to. With the output finished, the cycle of EDP has been completed.

Within just a few minutes, through the use of Electronic Data Processing and its logical, accurate flow from input to processing to output, the situation has gone from raw data (a vague idea of who committed the crime) to useful information (a definite possibility of finding and arresting the correct suspect). EDP is used in a similar manner for an almost infinite number of tasks, including accounting, medical diagnosis, control of nuclear power plants, record keeping, and computer assisted instruction.

SAMPLE LECTURE

PUTTING COMPUTERS INTO PERSPECTIVE

(Begin with, end with, or include in this lecture personal examples of your struggles with learning to adjust to computers, with learning how to use them and accept them as a part of daily life. Encourage student comments and discussion of their experiences at the end of the lecture).

The "synergistic effect" of computers and people working together to achieve what neither can do alone is the ideal, and adds many dimensions to modern life that we would not have without our use of computers. However, there is the possibility of people becoming so dependent on the use of computers that they become unable to think for themselves. This would be fatal in a case of large-scale disaster, when survival often depends entirely on oneself, since we have all seen how everything practically comes to a standstill in even small-scale power outage, while everyone waits for the computers to come back on.

Computers can be programmed to do things we don't want to do, giving us time to do other things. They don't need lunch breaks, and, if programmed accurately, don't make mistakes in computation the way people do.

this is a boon to big business, small business, and the individual who can't balance a checking account.

In written communication, as well as personal writing, word processing is a wonderful means of writing quickly and accurately. Word processing makes creating neat, attractive communication an easy reality.

Businesses can also use computers to obtain the very latest in decision-making information, which can mean big money. Businesses can use computers to analyze employee problems, and to cut down on scheduling and traveling needs by having meetings-by-computer.

On the con side, we have to remember that computers are finite, while the human brain has an infinity of ideas, which shouldn't be wasted just because a computer is faster and easier to use. A computer cannot give personal service when a problem comes up. Clerical workers have developed a tendency to hide behind computers and claim they can't help with problems because "the computer did it," or "the computer says so." This is a common source of poor relations between businesses and their customers.

In personal life, it has become common for people to computerize their mailing lists so that their

computers can send letters, announcements, and Christmas cards to their friends. This promotes an artificial view of friendship and causes alienation by having computers mediate between people. In business, a computerized form letter modified and sent to a customer or client may not get as much attention as the one which was obviously personally dictated and which addresses the actual situation problem of the individual.

Computers have also created fear in many people -- the fear of being controlled by a machine they don't understand. When people don't understand something, they do fear it, and fear breeds hatred. With continuous education, we can learn to understand and control computers. Then we can enjoy the true potential that computers can have in our lives.

(Escalante, 1992)

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