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ABSTRACT

This study examined remedial/developmental studies students' attitudes toward computer aided instruction at a two-year college in central Georgia. A total of 86 students were surveyed with an instructor-developed instrument to determine if the students held positive attitudes toward using the computer, felt that computer aided instruction was beneficial in helping them to understand their current studies, and felt that computer skills learned were transferable to the workplace. Survey items related to students enjoying using the computer, finding the computer helpful in their current classes, and gaining useful skills for the workplace were significant. Results indicated that students overwhelmingly held positive attitudes toward using computers, felt that computer aided instruction was beneficial in helping them learn material being currently covered in class, and thought computer skills learned were transferable to the workplace. (Contains 28 references.) (Author)

REMEDIAL/DEVELOPMENTAL STUDIES STUDENTS' ATTITUDES TOWARD COMPUTER AIDED INSTRUCTION

by

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B.A., Virginia Polytechnic Institute and State University, 1991

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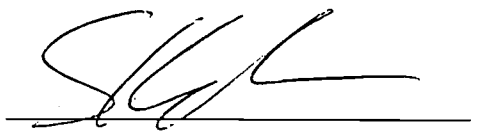

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ABSTRACT

This study examined remedial/developmental studies students' attitudes toward computer aided instruction at a two-year college in central Georgia. A total of 86 students were surveyed with an instructor developed instrument to determine if the students held positive attitudes toward using the computer, felt that computer aided instruction was beneficial helping them to understand their current studies, and felt that computer skills learned were transferable to the workplace. Survey items related to students enjoying using the computer, finding the computer helpful in their current classes, and gaining useful skills for the workplace were significant. Results indicated that students overwhelmingly held positive attitudes toward using computers, felt that computer aided instruction was beneficial in helping them learn material being currently covered in class, and thought computer skills learned were transferable to the workplace.

CHAPTER I

Introduction

Across the United States, students are entering college lacking the academic skills necessary to be successful in college course work. These students often must take remedial/developmental studies classes to either refresh or provide those skills before being allowed to take regular college classes. "Remedial education is more extensive than most people realize...Thirty percent of entering freshmen--55 percent at minority colleges--enroll in at least one remedial course" (Manno, 1995, p. 47). In addition to academic skills, these students often need additional non-academic skills since employers are looking for employees with skills that include "critical thinking, quantitative reasoning, and effective communication, along with abilities, such as the ability to find needed information and the ability to work well with others" (Twigg, 1994, p. 24) and using the computer. If these students cannot compete in the college classroom, how can they compete in a global economy?

In addition to educating and strengthening the academic skills of these students, educators of remedial/developmental studies students face budget constraints and varying levels of student abilities, interests, and backgrounds all coupled with an exceedingly

short period of time in which to build essential skills, usually 10 to 12 weeks. For these educators, computers seem like a godsend. The big push toward technology especially in remedial/developmental studies education is founded upon the very claims made by hardware and software developers: instructors can get more done in a shorter amount of time with less money. The computer can take over the drill-and-skill aspect of remedial instruction freeing up more time for the instructor to take advantage of other types of instruction such as one-on-one or cooperative learning. When providing drill-and-skill practice to the student, the software on the computer itself can help individualize and enrich the student's learning. Software can have "branches, providing instructional support appropriate for students of different ability" (Gage & Berliner, 1992, p. 473). In addition, Gage and Berliner noted that the computer can also evaluate student responses and decide whether the student needs more practice or can advance to the next level.

Remedial/developmental studies students need academic skills as well as skills to be productive in the workforce. Implementing computers in the classroom can help give instructors the time to focus on critical thinking and problem solving skills while the computer itself can help reduce student anxiety levels, focus on basic academic instruction, and develop the skills in demand by employers.

Studies have shown that computer aided instruction is effective (Berry, 1994; Maul & Spotts, 1993; Raidl, Wood, Lehman, & Evers, 1995; Reisman, 1993). Two particular studies stand out when considering the research specifically concerned with remedial/developmental studies students: Griffin's The effect of computers on secondary remedial writing in 1991 and Bliss's Technology and at-risk students: The TLTG project at Robbins in 1991. The study by Griffin addressed the issue of using computers to improve writing skills of remedial/developmental studies students. Griffin reported that he observed 86% of the subjects in the sample had extreme difficulty using the computer when given the pre-test computer paragraph writing proficiency examination. After 12 weeks of instruction and using computers for word processing and drill-and-skill work, all subjects passed the required writing proficiency exam. The use of the computer when writing increased the subject's comfort level (100%) and the content of the writing itself. One subject commented, "I like working with the computers. It provides real work experience. It has helped my writing in long-hand, especially in organizing my paragraph. Since it is easier to write on a computer, I don't mind writing" (Griffin, 1991, p. 51).

The other study released by Bliss in 1991 reported no significant gains in achievement scores of at-risk students

enrolled in science courses utilizing interactive video instruction. There was, however, a decrease in the drop-out rate. More importantly, 92% of the subjects reported that they enjoyed using the computer, and "more than three quarters (77%) agree that since taking this course, they think it is important to be able to use technology to succeed in the future" (Bliss, 1991, p.8). These results indicate that it would be beneficial to use computers with these students even if it only helps to motivate them.

Statement of the Problem

Do remedial/developmental studies students view computer aided instruction 1) in a positive manner and as helpful in their current studies and 2) the computer skills learned as useful for future employment?

Purpose of the Study

The purpose of this study was to investigate the attitudes of remedial/developmental studies students toward computer aided instruction. Of particular interest was whether or not the students held a positive attitude toward using computers and felt that computer aided instruction was helping them to better understand content currently being presented to them in class. Also of concern was whether or not students felt that computer skills learned would be transferable to the workplace.

Statement of the Hypotheses

There was a significant number of subjects who reported that computer aided instruction was helping them understand current subject matter and held a positive attitude toward using computers. There was no significant difference in the number of subjects reporting that computer skills learned were transferable to the workplace.

Definition of Terms

The following is a list of terms whose definitions are necessary in understanding the computer as it relates to remedial/developmental studies education.

Remedial/developmental studies

Courses in a program designed to improve basic academic skills in order for a student to be successful in college-level work. These courses are usually offered in the english, reading, and math content areas.

Computer aided instruction

Any area of instruction that is supplemented by or conducted with the use of computers and various software.

Assumptions

It was assumed that all students had received computer aided instruction for at least one hour per week in each remedial/developmental studies class for which they were enrolled. It was assumed that although the method of implementing computer aided instruction into the classroom

may have varied slightly among instructors, the actual hands-on experience was comparable for the purposes of this study.

Limitations of the Study

Since the study was conducted at the two-year college level, some subjects may have had more experience with the computer aided instruction in secondary schools. This could have effected the study positively for those having the most experience and negatively for those having the least. Another possible limitation of the study could be in the design of the survey. The survey responses were based on a Likert type scale (strongly agree to strongly disagree) omitting the middle response of no opinion. This was done to encourage the subjects to carefully consider their answers on the questionnaire.

Significance of the Study

This research provides information on student attitudes toward a program already in place. This information could be used to make curriculum decisions regarding the extent to which and how computer aided instruction should be implemented in the classroom, and whether or not emphasis should be placed on demonstrating the practicality of learning computer skills. The information could also indicate any changes that should be made in the software content and presentation of the existing program. Emphasis

is now being placed on educators to author tutorial software themselves. This study could be instrumental in considering design features. Finally, this research would be helpful as a resource for any one wanting to duplicate this project.

CHAPTER II

Review of the Literature

Educational Computing Today

"For the foreseeable future, computing will play an increasingly important role in human learning. However, no one yet knows exactly how great that role will eventually be, or precisely what form it will finally take" (Taylor, 1980, p. 1). Computers have been integrated into every aspect of our lives since Robert Taylor wrote his book in 1980. An individual cannot make a purchase or even visit the doctor without having experienced the influence of technology. But in the midst of the increasing use of technology, has our nation's educational system come as far as the rest of the world in integrating computers into the classroom?

As part of the nation's GOALS 2000, schools are being asked to provide increased access to computers and other learning technologies for students. "Over the last decade an estimated $2 billion has been spent on more than 2 million computers for America's classrooms" (Gelernter, 1994, p. 14). In regard to higher education,"computers are being mass-purchased and labs are being built to teach everything and anything in America's community colleges" (McGrath, 1995, p. 40).

Improvements in hardware and software since the early 80s have allowed possibilities never before imagined. Educational software is now available for all subject areas and has the capabilities of animation, sound, engaging graphics, and interaction. Even virtual reality is a reality, already being perfected for use with military and commercial pilot training programs. In fact, in many schools not only do students have access to standard computers and educational software, they have access to the world via the World Wide Web and the Internet due in part to advancements in hardware development. Data transfers from hundreds of miles away only take seconds over the same hardware that provides access to local electronic mail. These new tools developed for use in the classroom have led to a proliferation of publications, workshops, and conferences to help educators implement technology into instruction. Even individual schools are trying to help teachers adjust by offering in-service training on utilizing computer aided instruction.

How do teachers feel about integration in the classroom? Even with all of these gains, there are mixed feelings among educators on the usefulness of computers in the classroom. In 1994, David Gelernter summed up the opinions of some educators with the following:

In practice, however, computers make our worst

> educational nightmares come true. While we bemoan the decline of literacy, computers discount words in favor of pictures and pictures in favor of video. While we fret about decreasing cogency of public debate, computers dismiss linear arguments and promote fast, shallow romps across the information landscape. While we worry about basic skills, we allow into the classroom software that will do a student's arithmetic or correct his spelling. (p. 14)

Some, however, oppose this view and firmly believe in the usefulness of computers in the classroom. A study by Neiderhauser and Stoddart (1994) showed that teachers held positive attitudes about using computers although their ideas on how the computer should actually be implemented were different. Some of the teachers viewed the computer as a tool to impart knowledge while others saw computers as a way to engage the student in active learning.

Exactly how are computers being used in the classroom? As previously mentioned, some students have access to the World Wide Web and the Internet. Some of their teachers are now requiring resources for term and research papers from these sources. In some schools, a computer lab is set up as a resource center in which a student can do some drill and skill work, type a paper, and get one-on-one computer aided instruction. With the onset of multimedia, other students

are allowed to break the traditional mold of turning in a written or typed essay and instead create an audio-visual presentation of their ideas. Other schools are taking advantage of technology with distance learning by offering courses completely on-line. Students interact with the instructor via two-way video and electronic mail. The possibilities are limited only in the resources of the school and the resourcefulness of the instructor.

Considering the pervasiveness of technology into society, students must have exposure to computers and acquire the knowledge and the skill to use them in order to compete in the workforce. Skills desired by employers today include "critical thinking, quantitative reasoning, and effective communication, along with abilities, such as the ability to find needed information and the ability to work well with others" (Twigg, 1994, p. 24). Students will have to use critical thinking and reasoning skills to solve problems while using the computer to find resources and to communicate globally when they enter the workforce.

The Remedial/Developmental Studies Student

One population that can especially benefit from computer-aided instruction and at risk for computer illiteracy problems is the remedial/developmental studies student. "Remedial education is more extensive than most people realize--75 percent of U.S. colleges now offer such

courses in reading, writing, and mathematics. Thirty percent of entering freshmen--55 percent at minority colleges--enroll in at least one remedial course" (Manno, 1995, p. 47). The remedial student is the student who came to college under prepared. He has to either improve or gain basic academic skills before he can take regular college classes. In addition to the issue of preparing the student, there is the issue of cost. "For example, in 1993-94, CUNY's senior colleges spent nearly $5.4 million on non-teaching, freshman-year program like counseling and tutoring aimed at reducing the one-third drop-out rate of first-year remedial students" (Manno, 1995, p. 47). Imagine how much money is spent on the teaching programs!

Much time in remedial/developmental studies classrooms is spent on strengthening academic skills so that the student can perform college level work. What the educator faces in these classrooms are varying levels of abilities (Nelson-Denny scores in reading from the third grade reading level to the thirteenth), interests (some students are on sports scholarships and just waiting until they get picked up by a pro sports team), and backgrounds (rural to inner-city) coupled with an exceedingly short period of time in which to strengthen needed academic skills, usually ten to fourteen weeks. In addition to academic skills, remedial students need to develop learning skills. According to a

study by Bolge in 1994, the learning skills most needed by remedial/developmental studies students were analyzing, focusing, comprehending, retaining over time, and integrating. A common complaint among remedial/developmental studies educators is that there is no time to fully address academics much less address the needed learning and studying techniques.

For these educators, computers seem like a godsend. The computer can take over practice and drill instruction freeing up time for the instructor to focus on improving other skills that the student needs. Companies and consortiums are capitalizing on this need by emphasizing the amount of time and money saved. IBM has developed a complete system including the hardware and the software aimed at remediation called Desklab. A group in Florida working with IBM, Project Synergy, has organized an extensive database containing thousands of entries on software for possible use in remediation classes eliminating some of the need for time consuming software reviews. Even College Board has developed a series of software modules aimed at remediation.

The big push toward technology especially in remedial and developmental studies education is founded upon the very claims made by hardware and software developers - instructors can get more done in a shorter amount of time with less money. The computer can take over the drill-and-

skill aspect of remedial instruction freeing up more time for the instructor to take advantage of other types of instruction such as one-on-one or cooperative learning. When providing drill-and-skill practice to the student, the software on the computer can have "branches, providing instructional support appropriate for students of different ability" (Gage & Berliner, 1992, p. 473). This is very important since students in remedial/developmental studies classes have greatly varying ability levels. Gage and Berliner also noted that the computer can also evaluate student responses and decide whether the student needs more practice or can advance to the next level eliminating some of the time spent by teachers on evaluation.

The time the student spends on the computer itself should be beneficial and more conducive to learning. Many remedial/developmental studies students have difficulties with traditional style instruction due to their individual learning styles. "A recent study by Davidson and Savenye (1990; and with Orr, 1992) suggests there is a relationship between learning style and performance on computer-based instructional tasks" (Orr & Davidson, 1993, p. 3). "By means of earphones and television screens, it is possible to present material to a student in nonverbal form (pictures, diagrams, motion pictures) and in auditory form" (Gage & Berliner, 1992, p. 473) taking advantage of his preferred

individual learning style.

In addition to differing learning styles, many remedial/developmental studies students also experience anxiety about speaking out and possibly giving the wrong answer in front of the class. "The impersonal and objective quality of the computer has been cited as an advantage" (Byrnes, Forehand, Rice, Garrison, Griffin, MacFadden, & Stepp-Bolling, 1991, p. 4) since no condemning judgement is being made by the teacher or classmates. More importantly, the feedback being given is immediately taking advantage of "the teachable moment [and] the opportunity for change" (Byrnes et al., 1991, p. 4).

In addition to strengthening weak skills, remedial/developmental studies students need skills for being productive in the workforce. Due to the shifting nature of our economy, remedial/developmental students especially need these skills in order to successfully compete in the workforce if they do not continue on in college. "Steve Ehrmann of the Annenburg/CPB project has pointed out that we live in a world richer in information and in the tools for using information than most of us can exploit because we lack the skills to use them" (Twigg, 1994, p. 25). Remedial/developmental studies students are especially lacking in these skills.

In 1988, the Educational Testing Service published a

report on the results of the first nationwide survey of computer competence among American students, eight years after Taylor's book was published. The survey found that, at that time, computers were used very little in the classroom and thereby denying much needed computer skills to certain portions of the population related to socioeconomic status (LaPointe & Martinez, 1988). Another study addressed concerns about student anxiety toward computers. "Given current societal realities, such feelings might deprive individuals of career opportunities, make their lives less efficient, and hinder their professional or academic development" (Pope-Davis & Vispoel, 1993, p. 83). These students that both studies refer are likely to be in the remedial/developmental studies classrooms. Implementing computers in the classroom can help give instructors the time to strengthen critical thinking and problem solving skills while the computer itself can reduce student anxiety levels and develop the skills in demand by employers.

Attitudes Toward Computers

Studies have shown that computer aided instruction is effective (Maul & Spotts, 1993; Raidl, Wood, Lehman, & Evers, 1995; Reisman, 1993), but most researchers feel that negative attitudes toward computers and computer aided instruction of teacher and students could be detrimental to a program's effectiveness. When the first wave of technology

first began to hit education, there was resistance among instructors. "Early research often cited replacing teachers with computers as the goal" (German, 1987, p. 22). This may have discouraged teachers initially and could possibly still have a residual effect on a few even today. German further stated in his article that "the majority of teachers with access to a computer use it rarely... In short, computers seem to be viewed largely as interesting, but not understood, gadgets that are too difficult to incorporate into the existing curriculum for a benefit which is perceived to be small or even questionable"(p. 22). Since recent research is still concerned with in-service and pre-service computer training for teachers, effective use of computers in the classroom must remain a problem for schools. In a study on teachers' perspectives on computer-aided instruction, the "use of technology for instructional purposes can be differentiated into two discrete categories: some teachers believe that computers are tools that students use in collecting, analyzing, and presenting information, while others believe that computers are teaching machines that can be used to present information, give immediate feedback, and track student progress" (Niederhauser & Stoddart, 1994, p. 10-11). Surprisingly, another study (Powell & Reiff, 1993) found that although pre-service students held positive attitudes about computers in regards

to assisting the teacher and improving the education of children, their own preferences were more negative about using computers for learning and as a preferred strategy.

Students, however, seem to have held positive attitudes toward computers even during early research. "Most say that they like computers and wish that they could use them more often in school....If policy decisions were based on students'current attitudes, computer-related education would saturate the schools" (LaPointe & Martinez, 1988, p. 60). A recent study (Chirwa, 1992) reported not only positive attitudes toward using computers, but the computer exercises were perceived by the subjects as making them think. Additionally Chirwa observed what appeared to be enjoyment and motivation on behalf of the subjects using the computer. Even if the computer has no significant impact on achievement, the computer seems to influence attitudes in terms of motivating the student to look forward to further instruction or engage in learning on their own (Seymour, Sullivan, Story, & Mosley, 1987).

When considering the research concerning positive attitudes of students in remedial/developmental studies education, two particular studies stand out. In a study by Griffin in 1991 using remedial students as subjects, the issue of using computers to improve writing was addressed. Griffin reported that he observed 86% of the subjects in the

sample having extreme difficulty using the computer when given the pre-test computer paragraph writing proficiency examination. After 12 weeks of instruction using computers for word processing and drill-and-skill work, all subjects passed the required writing proficiency exam. Where initially only thirty-one percent of the subjects reported feeling very comfortable using the computer, post-test results revealed 100 percent of the subjects felt very comfortable. The subjects also indicated that using the computer was very useful for improving editing skills (77%). When using long-hand to compose paragraphs, the subjects wrote less than they did on the computer. The most insightful statement came from one of the subjects. "I like working with the computers. It provides real work experience. It has helped my writing in long-hand, especially in organizing my paragraph. Since it is easier to write on a computer, I don't mind writing" (Griffin, 1991, p. 51).

The other study, released by Bliss in 1991, reported no significant gains in achievement scores of at-risk students enrolled in science courses utilizing interactive video. There was, however, a decrease in the drop-out rate. Also, it is important to note the results of the Student Attitude Survey. In spite of the fact that almost two-thirds of the subjects reported never or almost never used a computer, 92%

reported that they enjoyed using the computer. Most significant was the following: "More than three quarters (77%) agree that since taking this course, they think it is more important to be able to use technology to succeed in the future; the remainder were neutral" (Bliss, 1991, p. 8). These results indicate that it would be beneficial to use computers with these students even if it only helps to motivate them.

Summary

When educators consider the role of technology in society at large, it would be a crime to deny students the opportunity of working with computers in the classroom. Studies have shown that using technology can help achieve significant gains in achievement scores and at the very least, improve motivation of the students to learn. When employers are demanding skills unique to technology in more and more fields, education has to answer to the public. That education is responding to these demands evident in its commitment by spending the necessary money in access to labs and training for instructors. If the trend continues to move forward, then that aspect of GOALS 2000 will be met, and America can more successfully compete in a global economy.

CHAPTER III

Methods and Procedures

Issues, Purpose, and Hypothesis

The purpose of this study was to investigate the attitudes of developmental studies/remedial students toward computer aided instruction. Of particular interest was whether or not these students held positive attitudes toward computers and felt that computer aided instruction was helping them better understand content that was currently being presented to them in class. Also of concern was whether or not the students believed the computer skills learned were transferrable to the workplace. The hypothesis was that there would be a significant number of subjects reporting that computer aided instruction was beneficial in helping them to understand the current subject matter and who held positive attitudes toward using the computer. However, there would be no significant difference in the number of subjects reporting that computer skills were transferrable to the workplace.

Description of subjects

The population of this study consisted of 333 freshmen college students who were enrolled in a remedial/ developmental studies program located in central Georgia during the fall quarter. The population included a small number of non-traditional students. Most, however, were

traditional students. All students in the population had been enrolled in at least one developmental studies/remedial class. There were three different content areas in this particular program: reading, english, and math. Due to the general and very broad scope of this study, the responses from the different content areas were not separated. All of these students were exposed to computer aided instruction for at least one hour per week in each class for which they were enrolled since computer aided instruction is an integral part of this particular school's remedial/developmental studies curriculum. The sample of this study consisted of 86 randomly selected subjects from the population. Official class rolls were collected of all sections of remedial/developmental studies classes being offered that quarter. The rolls were randomly ordered, and students were numbered consecutively. The sample was then selected using a random number table. If a subject was duplicated, the next number in the random number table was used. Subjects for the pilot survey were selected after the 86 subjects for the final survey and an additional 10 alternates were selected.

Instruments

The instrument used to assess the subject's perceptions was an instructor developed survey utilizing a Likert-type scale. Statements were constructed by reviewing and

analyzing the literature that included surveys by German (1987), Bliss (1991), Jones and Clarke (1994), and Chirwa (1992). The final draft of statements was constructed for the population and the type of information desired. The possible responses ranged from strongly agree to strongly disagree. The no opinion option was left out of the possible responses to encourage a more thought out and deliberate response from the subjects.

Procedures

The sample for the pilot survey and the final survey was selected from the population of 333 freshmen college students enrolled in remedial/developmental studies classes that fall quarter. The sample for the pilot survey was selected after the sample for the final survey was selected. All subjects were randomly drawn. There were 20 subjects selected for the pilot survey and 86 for the final survey. Ten additional subjects were selected in the event that any of the original sample could not be used. Two of the alternates had to be used for the final survey. The pilot survey was distributed to the subjects in their computer lab class during the sixth week of the quarter. Results from the pilot study indicated that no changes needed to made to the instrument. The final survey was then distributed to the subjects in their computer lab class during the seventh week. The subjects completed the survey and placed the

survey into a collection envelope in random order to ensure confidentiality. If a subject was missing from computer lab class, the instrument was given to them in the regular classroom with instructions to put the completed survey into the envelope in a central location in the computer lab. All surveys distributed were returned. After all surveys were returned, the surveys were tabulated using software, Insti-Survey (TM), designed specifically for that purpose. This method calculated the number of responses for each response category for each statement of the survey and corresponding percentages. These figures were then analyzed using chi square analysis to determine significance levels.

CHAPTER IV

Results and Discussion

Data Analysis

The researcher examined remedial/developmental studies students' attitudes toward computer-aided instruction. In October 1996, a survey was developed to measure these attitudes after reviewing previously published surveys concerning attitudes toward computers. A remedial/developmental studies program at a two year college in central Georgia was selected for inclusion in the study. The researcher included all sections of that institution's remedial/developmental studies courses being offered that fall quarter. These sections included both day and night classes.

A pilot survey consisting of fifteen Likert-type scale items was distributed to twenty randomly selected subjects. The pilot study was conducted during the sixth week of the fall quarter. The subjects were instructed to circle confusing statements and reword if they desired to do so. Responses from the pilot survey indicated that no changes needed to be made to the instrument.

The final survey was distributed to eighty-six randomly selected subjects during the seventh week of the fall quarter in the subjects' computer lab classes. To ensure confidentiality, subjects were not asked to give their names

and to place the completed survey into the collection envelope themselves. If a subject was not available during the computer lab class, the survey was distributed in the regular classroom and instructed to return the completed survey to the computer lab.

The survey instrument consisted of fifteen items which contained both positively and negatively balanced worded statements concerning attitudes toward computer aided instruction. Subjects answered each items in one of the following responses: Strongly Disagree (SD), Disagree (D), Agree (A), or Strongly Agree (SA). The Undecided or Not Applicable option was not included to encourage a more thought out and deliberate response from the subjects. A total of 86 surveys were distributed, and 86 surveys were completed and returned.

Analysis of Findings

One-dimensional chi square analysis was used to determine levels of significance on each statement of the instrument. Of the fifteen statements, all revealed levels of significance. Twelve items achieved significance at the $p<.001$ level. Statements eight, ten, and eleven achieved significance at the $p<.01$ level.

The survey consisted of the following statements.

1. I do my computer work just to get it done.

2. When using the computer, I am able to concentrate on my lessons.
3. Using the computer is boring.
4. I learn the material more quickly when using the computer.
5. Completing lessons on the computer takes too much time.
6. I enjoy using computers.
7. I would rather do my lessons with pen and paper.
8. Using computers enables me to succeed in my current classes.
9. The computer allows me to work at my own speed.
10. I have gained computer skills that I can use at various jobs.
11. I would not like to take other classes that use computers.
12. I tell my friends that the computer helps me understand my coursework.
13. I tell my friends that using the computer is not all that helpful.
14. I need to know how to use a computer to do well in future classes.
15. It is not important to know how to use computers to find a job.

Significant levels of difference were calculated for all

statements at varying *p*-levels. Table 1 shows the chi-square values and levels of significance for each survey statement.

Table 1

Survey Statement	Chi square analysis	df	*p* level
1-work just to get done	16.976	3	$p<.001$
2-concentrate using computer	50.667	3	$p<.001$
3-computer is boring	45.442	3	$p<.001$
4-learn more quickly	18.476	3	$p<.001$
5-takes too much time	32.095	3	$p<.001$
6-enjoy using computers	55.143	3	$p<.001$
7-lessons with pen & paper	22.108	3	$p<.001$
8-succeed in current classes	15.847	3	$p<.01$
9-work at own speed	46.812	3	$p<.001$
10-gained computer skills	14.529	3	$p<.01$
11-not like to take classes	12.553	3	$p<.01$
12-tell friends helps	26.381	3	$p<.001$
13-tell friends not helpful	53.118	3	$p<.001$
14-need to know how to use	36.140	3	$p<.001$
15-not important to find job	77.765	3	$p<.001$

In statement one, contributing most to this significance were the students who strongly agree with the statement that they "do their computer work just to get it done". In fact, those who chose "Strongly Agree" compared to

the others achieved significance at the level of $p<.01$ alone. This means that a significantly less number of students chose to "do their computer work just to get it done".

In statement two, those who contributed most to the significance were the students who agreed with the statement that they "are able to concentrate on my lessons when using the computer" and the students who disagreed with the statement. Those who agreed achieved significance at the $p<.001$ level and those who disagreed achieved significance at the $p<.01$. This means that a significant portion of the sample agreed that using a computer enabled them to concentrate on their lessons while a significantly less number of students disagreed with the statement.

In statement three, those who contributed most to the significance were the students who strongly agreed and strongly disagreed with the statement that "using the computer was boring". Both responses achieved significance at the $p<.01$ level. This meant that a significant number of students did not think that using the computer was boring. Only four respondents strongly agreed with the statement.

In statement four, those who contributed most to the significance were those who responded both agree and strongly disagree to the statement that they "learn the

material more quickly using the computer". Both responses achieved significance at the $p<.05$. This meant that a significant number of students responded that they agreed with the statement that they learn more quickly using the computer while a significantly less number than expected strongly disagreed with the statement.

In statement five, those who contributed most to the significance were those who responded that they disagreed with the statement that "completing lessons on the computer takes too much time". This response achieved a level of significance at $p<.001$ alone. This means that a significant number of students thought that completing lessons on the computer did not take up too much time.

In statement number six, those who contributed most to the level of significance were those who strongly agreed that they "enjoy using the computer". This response achieved at level of significance at $p<.001$. This means that a significant number of student like using the computer.

In statement seven, those contributing most to the level of significance were those who responded strongly disagree to the statement "I would rather do my lessons with pen and paper". This response achieved significance at the $p<.05$ level. This means that significant number of student would rather use the computer to do lessons than use pen and

paper.

In statement eight, those who agreed with the statement "Using computers enables me to succeed in my current classes" contributed most to the significance and achieved significance at the $p<.10$ level. This means that a significant number of students agreed with the statement.

In statement nine, those who contributed most to the level of significance were those who strongly agreed with the statement that the computer allowed them to work at their own speed. This response achieved significance at the $p<.01$ level. This means that a significant number of students think that using the computer allows them to work at their own pace.

In statement ten, those who agreed with the statement that they had gained computer skills that they can use at various jobs contributed most to the significance at a $p<.05$ level. This meant that a significant number of students think that they have gained computer skills that can be transferred to the workplace.

In statement eleven, those who contributed most to the significance level were those who strongly agreed with the statement that they would not like to take other courses that use computers. This means that fewer responded that expected that they would not like to take future courses

that included using the computer. No responses, however, were significant at the $p<.10$ level or below.

In statement twelve, those respondents who contributed most to the level of significance were those who responded that they agreed with the statement that they "tell their friends that the computer helps them understand their coursework". This response achieved significance at the $p<.001$ level. These responses indicate that a significant number of students talk to their friends about how the computer is helpful in their coursework.

In statement thirteen, the response contributing most to the significance were those who responded that they disagree and strongly agree with the statement that they "tell friends that the computer is not all that helpful". Both responses achieved significance at the $p<.001$ level. This means that a significant number of respondents disagreed with the statement. Only one student out of the sample of 86 strongly agreed with the statement.

In statement fourteen, those who contributed most to the significance were those who strongly agreed and strongly disagreed to the statement that "I need to use computers to do well in future classes". Both achieved significance at the $p<.01$ level. This means that a significant number of students strongly agreed that they need to know how to use a

computer to do well in future classes, and that a significantly less than expected number of subjects strongly disagreed with the statement.

In statement fifteen, the respondents who contributed most to the level of significance were those who responded that they strongly disagreed with the statement that "It is not important to know how to use computers to find a job". This response achieved a level of significance at the $p<.001$ level. This means that a significant number of students strongly agreed that it is important to know how to use a computer in order to find employment.

Discussion of Findings

Of the fifteen survey items, twelve achieved significance at the $p<.001$ level. Items eight, ten, and eleven achieved significance at the $p<.01$ level. Items eight, twelve, and thirteen supported the hypothesis which stated that a significant number of subjects would report that computer aided instruction was beneficial in helping them understand current subject matter. Items three, six, and seven supported the hypothesis that a significant number of respondents held a positive attitude toward computers. Items ten and fifteen contradicted the hypothesis that there would no significant difference in the number of subjects reporting that computers skills learned would be

transferrable to the workplace. The remaining items help support the hypothesis on positive attitudes toward computers.

CHAPTER V

Summary and Conclusions

Summary

The purpose of this study was to investigate the attitudes of remedial/developmental studies students toward computer aided instruction. Of particular interest was whether or not the students held a positive attitude toward using computers and felt that computer aided instruction was helping them to better understand content currently being presented to them in class. Also of concern was whether or not students felt that computer skills learned would be transferrable to the workplace. Subjects in the sample were randomly selected from the population of all remedial/developmental studies students taking at least one remedial/developmental studies course the fall quarter of 1996. These students were enrolled in a two-year college in central Georgia. In order to conduct this study, the researcher developed a Likert-type instrument to measure remedial/developmental studies students' attitudes.

Conclusion

The survey consisted of fifteen survey items. After collection and analysis, twelve items showed significance at the $p<.001$ level, and items eight, ten, and eleven achieved significance at the $p<.01$ level. These items supported the

hypothesis that a significant number of subjects would report that computer aided instruction was beneficial in helping them understand current subject matter and held positive attitudes toward using the computer. The results contradicted the hypothesis that there would be no significant difference in the number of subjects reporting that computer skills learned would be transferrable to the workplace.

Overall, the students in this study showed very favorable attitudes toward using computers. The students also felt that knowing how to use computers was a skill that would be transferrable to the workplace.

Implications

Since the students in this study showed very favorable attitudes toward using computers, serious consideration should be given to implementing computers in the classroom in programs where it is not currently available. Individual instructors should consider implementing computer aided instruction into their classes even if there are no plans to do so program or school wide since students surveyed responded that they learned more quickly using the computer and the computer allows for concentration and self-pacing. This is especially important in the remedial/developmental studies classroom of varying abilities and multiple distractions. Remedial/developmental studies students like

using the computer, and instruction should take advantage of a method of delivery that the students actually enjoy. Additional studies should possibly look at student attitudes in regard to specific software used in computer aided instruction. Although this study shows that students are favorable toward computer aided instruction, students may enjoy using the computer simply because it gives them a break from straight lecture and a change in environment if the software is not effective. People who make curriculum decisions on any level, however, should strongly consider using computers in the classroom if only for the motivation effect and so that students may learn skills that they will truly need once they enter the workforce.

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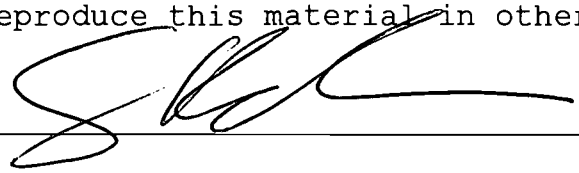
Sign Here, Please 

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