

Computer-Based vs. Text-Based ✓

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the title page*

Chapter One Research Proposal

Computer-Based vs. Text-Based Basic Skills Education Methods

(TRUE EXPERIMENTAL)

According to the National Adult Literacy Survey, 46 to 51 percent of American adults fall into the two lowest levels of literacy. These levels range from no literacy and quantitative skills at all to the ability to locate information in text, make simple inferences, and do simple one-step quantitative operations (Kirsch, Jungeblut, Jenkins, Kolstad, 1993).

American Society for Training and Development researchers note that the movement of American industry towards high technology production methods and greater employee involvement has created a great need for a work force with high literacy and quantitative skills (Carnevale, Gainer, Meltzer, 1990). Carnevale, et al. (1990) believe that the shrinking number of young people who are entering the work force will not be sufficient to supply industry needs; therefore, industry will have to draw from less-qualified demographic groups to obtain entry-level employees. These alternative groups are often deficient in basic skills such as reading, writing, and computation.

Both industry and the educational community are starting to address the need for adult basic education in the current work force and for future workers. John M. Patterson State Technical College, in Montgomery, Alabama, offers examples of both approaches. An on-campus adult basic education (ABE) class is offered to the general public, and the Roads Scholar program,

operated in partnership with local industry and the Montgomery Chamber of Commerce, serves the industry work force.

The Patterson College ABE class is offered at no cost to adults in the community who are interested in improving their reading, writing, language, and mathematics skills in order to pass the General Equivalency Degree (GED) examination. Entrance requirements for the ABE class include eligibility to take the GED examination and at least a third grade reading comprehension level.

Students in the Patterson ABE class use a textbook-based curriculum (Pace Learning Systems, 1987) that is tied to objectives tested by the Test of Adult Basic Education (TABE)(CTB/McGraw-Hill, 1987). The curriculum is self-paced, and a facilitator is available to provide one-on-one assistance with lessons when necessary.

Patterson College also uses a different type of ABE instruction to serve the local industry work force. The Roads Scholar program consists of a motor coach that is equipped with twelve computer workstations. The computer network in the Roads Scholar utilizes the WICAT (World Institute of Computer Aided Teaching) Advanced Instructional Management System software, which is an ABE package containing 15,000 individual lessons which range from kindergarten-level reading and math instruction to the five GED preparation subjects: literature, mathematics,

science, social studies, and writing skills (WICAT Systems, Inc., Product Guide, 1992).

The primary role of the Roads Scholar is to travel to local businesses on a regular basis and provide ABE services to employees, in an effort to upgrade the literacy and quantitative skills of the current work force. All lessons on the WICAT system are self-paced, and a facilitator is on the Roads Scholar at all times to provide instructions in computer use and offer one-on-one assistance with lessons when necessary.

Statement of the Problem

*GOOD PROBLEM STATEMENT.
CLEAR AND SUSCINCT.*

Anecdotal data suggests that the WICAT integrated learning system on the Roads Scholar appears to increase adult students' knowledge of reading, math, and language more quickly and comprehensively than the text-based system used in the on-campus ABE class. However, there is no objective data on which to make a decision about whether to purchase the WICAT integrated learning system for the ABE class. This study will attempt to quantify the differences in effectiveness between the two programs.

Purpose of the Study

CLEAR PURPOSE STATEMENT

The purpose of this study is to determine whether ABE students at John M. Patterson State Technical College attain greater objectives mastery, as measured by the TABE, after 30

hours of self-paced instruction in each of the following three areas: reading comprehension and vocabulary, mathematics computation and applications, and language mechanics and expression, by using the WICAT interactive integrated learning system, or by using the text-based delivery system currently available in the Patterson ABE class. This information will be used by college decision-makers in determining whether to convert the ABE class to a computerized education delivery system.

Significance of the Study

A government study estimates that approximately 80 percent of the work force for the year 2000 is already employed (Kirsch, et al., 1993). However, since about half the American population falls into the two lowest levels of literacy and quantitative skills (Kirsch, et al., 1993), the American work force is unlikely to be able to meet the challenges of the highly skilled jobs that will probably predominate in the next century. The biggest challenge for education right now is to improve the literacy and quantitative skills of the current work force as rapidly as possible. In order to meet this challenge, educators must use the most effective educational delivery methods available.

Computer-based education delivery methods are becoming increasingly popular among educators. However, the question arises: Is computer-based delivery more effective than the

paper, pencil, and textbook methods that have been used in the past? Can it deliver at least an equivalent level of student learning in a shorter period of time? These questions are important because a computer-based delivery system is significantly more expensive than the textbook system; however, if computer-based instruction can provide students with stronger basic skills and/or provide equivalent basic skills more quickly than textbook-based instruction, the expense of a computer-based system may be justified. A faster educational delivery system will allow more individuals to participate in the Patterson ABE class, which will aid the local economy by providing a greater number of entry-level workers with strong basic skills. The increased basic skills level of these new workers are likely to increase their productivity and their value to employers.

THIS
ADDRESSES
SIGNIFI-
CANCE OF
THE STUDY.
WELL
STATED.

Limitations of the Study

The following are potential limitations of the study:

Mortality

Since ABE programs traditionally have a high dropout rate (Quigley, 1992), mortality may be a threat to the study.

Generalizability

Because the sample is small and narrowly defined, and the educational delivery systems are quite specific, generalizability will be limited to the ~~sample~~ ^{SAMPLED} population. Since the John M. Patterson ABE program contains both evening students and day

students who tend to be different demographically from the evening students, the study will not even generalize to all John M. Patterson ABE students; however, the short duration of the study could allow it to be replicated using day students, thereby providing data that could generalize to a broader population of Patterson ABE students. — THEN WHY NOT DO THAT AND ELIMINATE

THIS LIMITATION?

Researcher bias

The researcher is the facilitator for the Roads Scholar; thus, unintentional bias may be introduced into the study.

THIS IS A SERIOUS LIMITATION. CONSIDER WAYS TO OVERCOME IT.

Methodology

Research design

The research will be conducted using the experimental pretest-posttest design. Twenty-four subjects will be selected randomly from the roster of evening students enrolled in the ABE class as of the first day of class of Fall Quarter, 1994. Twelve will be chosen at random to participate in the experimental group, and the remaining twelve will be the control group. The experimental group will be assigned to the Roads Scholar program, and the control group will remain in the ABE class.

WHY NOT INCLUDE DAY STUDENTS TOO?

Population

The population for the study will consist evening students who are voluntarily enrolled in the Patterson College ABE program. On the average, about 35 students participate in the evening ABE program each quarter.

Pretest

The complete TABE Locator and Placement tests will be administered to all 24 subjects on the first night of class for Fall Quarter, 1994. The TABE is a nationally normed battery designed to obtain objectives mastery scores for reading, language skills, and mathematics at the equivalent of Grade 2 through Grade 12. It is normed for ABE students (CTB/McGraw-Hill, Examiner's Manual, 1987). The tests will be machine scored. A t-test will be conducted on mean scores for the control and experimental groups to ensure that the groups are not significantly different. — *WHAT IF THEY ARE SIGNIFICANTLY DIFFERENT?*

Treatment

WHAT WILL YOU DO IF THEY ARE; WHAT WILL YOU DO IF THEY ARE NOT?

The experimental subjects will be provided individualized curriculum in WICAT based on a TABE objectives correlation developed by WICAT Systems, Inc. (VanHorn, 1988). Control subjects will use the Pace Learning Systems individualized curriculum that is also based on TABE objectives. Both groups of subjects will meet two evenings per week for four hours per session. Study hours for each subject will be closely tracked. Each subject will be provided 30 hours of reading comprehension and vocabulary instruction, 30 hours of mathematics computation and applications, and 30 hours of language mechanics and expression.

IF THE PREMISE IS THAT THE LONGS SCHOLAR PROGRAM CAN BE COMPLETED FASTER THAN TRADITIONAL INSTRUCTION, WHY NOT TEST THIS BY MONITORING TIME SPENT BY THE EXPERIMENTAL GROUP?

Posttest

Upon completion of all 90 hours of instruction, subjects will again take the TABE Locator and Placement tests. The tests will be machine scored.

Statistical Analysis

Means will be calculated for the TABE Locator and Placement pretests and posttests. An F-value will be computed using an ANOVA Two-Factor Factorial Design in order to determine statistical significance.

Information Dissemination

A report of the study will be written and disseminated to the president, dean of instruction, director of the ABE program, and the ABE class facilitator, as well as other interested individuals at Patterson College. Copies of the study will be made available to interested parties outside the college, as well.

Citations

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