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AUTHOR Taymans, Juliana M.; And Others
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ABSTRACT

The paper reports an inter-agency cooperative project to investigate the use of different instructional data bases to determine which characteristics were most facilitative for the instruction of 14- and 15-year-old urban students with a range of abilities in a summer career exploration program. Special education and rehabilitation professionals (N=20) in a university course learned and taught the three database management software systems (Friendly Filer, Mastertype Filer, and Filing Assistant) using a customized teaching manual developed by project personnel. Files containing career information were developed for each of the software systems. Structured group instruction plus individual assistance resulted in all students being able to perform basic database manipulations, some being able to add information to existing files, and a few able to create their own files and input their own information of interest. Students rated the computer lab as their favorite activity. Recommendations included introducing novices to application programs before more traditional educational programs; having novice computer instructors work as a teaching team; and encouraging individual applications transferable to professional positions. (DB)

DATABASE INSTRUCTION FOR SPECIAL NEEDS STUDENTS: PROGRAM DESCRIPTION AND RECOMMENDATIONS FOR PERSONNEL PREPARATION

BY

JULIANA M. TAYMANS, CARL T. CAMERON & ANN MARIE COOK

THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC

INTRODUCTION

There is currently a debate going on in the literature in the field of educational computer use regarding the most realistic and useful goals in computer applications for both educators and school age students. This debate centers on the inclusion of application software (i.e. wordprocessors, spreadsheets, and data bases) as a focal point for instruction. Although the range of computer instruction in schools is rapidly expanding, studies on computer uses in schools indicate that instruction in computer applications still represents a very small percentage of computer based instruction time (Becker, 1987), especially for special needs students (McArthur, Haynes, Malouf, Taymans, Mattson, & Dreifus, 1985; Cosden, Gerber, Semmel, Goldman & Semmel, 1985). The exploration into application software use is underway, and many questions are being posed related to how application software, like word processing, spreadsheets and databases can be integrated into existing curricula. Efforts to expand upon the ways computers can and should be used in classrooms require experimental

activities and demonstration models.

This article describes a summer institute developed in conjunction with International Business Machines (IBM) which integrated university, local government and business resources for the purpose of training special education and rehabilitation professionals, and providing school age urban youth specialized skills in the use of computerized data bases.

Personnel from the Special Education Department at The George Washington University developed the Career Awareness and Work Exploration Project (CAWE) for 14 and 15 year old urban youth through a grant from the Mayor's D.C. Summer Youth Program. The purpose of the project was to give young teenagers work experience (for 3 hours a day), as well as career education class (for 1 hour a day), for seven weeks during the summer. The participants were paid minimum wage for their participation in both the work and class experiences. The focus of this article is on computer lab activities, which took place during the career education classes.

As part of the planning process for the CAWE project, personnel from IBM's Division on Educational Services were contacted for assistance in developing the computer applications for career awareness activities. The ensuing discussions developed into a cooperative effort to provide computer training to youth as well as special education and rehabilitation professionals. IBM agreed to utilize CAWE as a Summer Institute based on a twofold rationale. First of all, IBM was interested

in supporting a project that dealt with transition to work issues with city youth, many of whom were in jeopardy of dropping out of school. It had been agreed that the focus of the computer lab would be on computer application skills that could easily and obviously transfer to real job situations. It was decided that students could benefit from experiences in organizing and retrieving information, so data base software programs were chosen for students to use in the computer lab. Secondly, IBM is interested in encouraging technological expertise of professionals interacting with special needs youth and was agreeable to share its hardware and software in the development of a graduate level university course on computer applications for special education and rehabilitation professionals. IBM indicated that they would loan computer hardware and software under the auspices of their summer institute program. This loan involved the use of eleven (11) IBM PC jr's, printers, an array of software that could be used both by students and teachers, and technical assistance in setting up the computers. The initial commitment of resources by IBM allowed the CAWE computer lab concept to become a reality and served as the basis for the activities described below.

RESEARCH PROJECT

In conjunction with CAWE, the George Washington University funded a research project to investigate the use of different instructional data bases - Friendly Filer, Mastertype Filer and Filing Assistant - to determine which characteristics were most

facilitative for the instruction of students with a range of abilities, and to collect information about the potential of using computerized data bases for career exploration. The initial tasks assumed by research personnel were to develop teacher reference manuals for each of the three data bases. In addition research personnel researched and developed career files for each of the three data bases. These files contained information on occupations based on information from the The Guide to Occupational Exploration (U.S. Department of Labor, 1984), and the Dictionary of Occupational Titles (U.S. Department of Labor, 1977). Research personnel continued to be available during the actual computer lab time to assist with technical problems. As part of the research project research personnel also collected data on the behaviors of both the youth and special education and rehabilitation personnel who were instructing the groups. This observational information collected during the instructional phase is being analyzed and the subsequent research reports will be available in future publications.

PERSONNEL PREPARATION

Twenty special education and rehabilitation professionals enrolled in a summer course on computer technology. The course consisted of four evening classes of intensive course work familiarizing participants with both the computer hardware and data base software they would be using. Participants were divided into four groups for teaching purposes. Each of these

groups was responsible for learning, developing lesson plans, and finally teaching the CAWE students one of the three data bases: Friendly Filer, a beginning data base program; Mastertype Filer, an intermediate data base program; and Filing Assistant (also marketed as PFS: File) a more advanced data base program (two teacher groups were responsible for Filing Assistant).

Each course participant was given a customized teaching manual, developed by research personnel, for their data base. The manual described how the data base operated, the information in the careers file, and listed teaching ideas and activities. As part of the preparatory classes, the teaching groups worked with a member of the research staff or course instructor to identify how they would teach the data base to students. The final class consisted of each group presenting a tentative instructional schedule for the students they would be teaching, as well as a demonstration lesson, by each group, for the rest of the class.

In preparation for the actual computer lab training the groups were instructed to have a different lead teacher every day for instruction. The other teachers were to act as instructional aides This was done to ensure that all course participants took an active role in data base instruction.

Each teaching group worked as a team in both preparing and teaching lessons. Teachers had access to the computer lab for the entire day during the two weeks they taught. The teacher groups spent from one to four hours a day in planning and

evaluating their instruction. They also were responsible for developing a data base file they could use in their jobs. This activity helped the professionals become more proficient in data base manipulation since they had to plan and input their own file. Both the course instructors and teachers themselves were impressed by the amount of computer expertise the teachers developed in such a short period of time.

The CAWE students were divided into four groups and assigned to one of the groups of teachers for the data base instruction. Each group of students attended data base instruction in the computer lab for one hour a day over a nine day period.

OTHER COURSE ACTIVITIES

In addition to the instruction in database use, mini-sessions were developed by the university instructors. A series of special application introductory modules were provided, which included word processing, spreadsheets, shells and authoring programs, and relational databases. As part of the course requirements, students were required to use one of these application packages (and were encouraged to use the data base they had the most training with) to develop an application that they could use when they returned to their teaching assignment. All participants were also given basic instruction on the use of IBM hardware, in order to use laboratory equipment.

STUDENT PERFORMANCE

The diversity of students in the summer youth program was very evident in the computer lab. In regard to career awareness

skills, some students were familiar with a wide range of jobs and were able to express occupational preferences while other students obviously had very limited occupational knowledge. Likewise the basic skill level of students ranged from students proficient in reading and writing, to students who experienced great difficulty in performing basic reading and writing tasks. Although most of the students indicated that they had some computer experience in school, very few were able to perform even basic computer operations independently (i.e. to boot up a computer program).

The professionals focused the computer lab activities on making students independent computer users through very structured instruction. Initially computer lab instruction focused on such basics as disk care, keyboarding and loading programs. Students were guided step by step in the process of using menus, searching, and sorting. The professionals often started a task with a worksheet to help students learn the process as a group. The structured group instruction and the amount of assistance available from the team of professionals facilitated overall student performance. The team teaching situation in the lab allowed for individual assistance for students who excelled as well as for students who needed extra help.

As the two-week student instructional experiences progressed, all students were able to successfully perform basic data base manipulations such as searching for jobs based on

specific occupational information (i.e. salary range, working conditions, type of dress required). Many students were able to add information to already existing files while more advanced students were able to create their own files and input information of interest. Both teachers and course instructors reported that student motivation appeared high. There was a noticeable lack of behavior problems and a high degree of on-task behavior. The lab set-up and equipment enabled most students to work individually at a computer, which allowed students to spend most of the lab time working in structured hands-on activities. At the conclusion of the CAWE project, the students rated the computer lab their favorite out of the 15 activities included in the program evaluation.

DISCUSSION AND RECOMMENDATIONS

Both the university course and youth computer lab activities were experimental. Course instructors and research personnel wanted to investigate the feasibility of having professionals with little expertise in computer applications and computer based instruction become responsible for computerized instruction with brief introductory training. Course instructors and research personnel were also interested in the efficacy of having novice computer users begin by using application computer software such as data bases. Initial analysis of the course results and research findings indicate the following:

o **Having professional learn computer application programs as an initial computer experience is effective for a number of reasons.**

1. Working with a computer for data base manipulation is very interactive and requires active problem solving by the user in initial use. This experience caused the teachers to tak an active approach in working with the computer. When introducing professionals to other types of computer activities traditionally used in schools (such as game programs, or other types of CAI), the user is usually required to interact with the computer in a much more limited way which is not as conducive to problem solving and conceptualizing computer operations. In such programs, the software demands more limited user input, and the user feels less responsibility for problem solving when something goes wrong.

2. All the professionals reached independent functioning in a data base and word processing program. Through the course interactions, it became very clear to the professionals that they could use these application programs in a variety of ways both professionally and personally. This was very motivating.

3. The literature in special education computer applications supports the premise that many professionals fail to teach students how to use instructional programs and also fail to monitor student progress on the computer. By having professionals initially learn and teach application programs, this situation will not occur since there is no way an individual

can use an application program without instruction and monitoring.

Recommendation: Introduce novice computer users to computer application programs first before introducing more traditional less interactive educational programs.

o **Having professionals responsible for directly instructing students, provided a compelling motivation for them to learn the data base programs.**

A dimension of relevance and reality, which is often lacking in graduate level courses, was added by having the course based on student instruction. Although each professional group entered their instructional time with an outline of activities to be accomplished, they only had to plan in detail for one hour of instruction at a time. This was a manageable task. Being new data base users themselves, data base aspects that they found difficult to understand or manipulate were fresh in their minds which helped them provide more focused instruction.

Recommendation: Include student instruction as part of introductory computer education experiences for educators.

o **Having novice users deliver computer instruction as a team is a non-threatening means of introducing professionals to computer instruction.**

The team teaching situation proved to be a supportive means for professionals to try out computer instructional techniques.

All of the four team teaching groups spent considerable time planning and evaluating their instruction. Every lesson that was delivered was planned by the group so no individual was at risk for failing. Likewise, if a lesson was not going well, there were three members of the group, in addition to the lead instructor, who could offer individual assistance to students who needed help. Professionals were very supportive of each other and were able to effectively evaluate and modify instructional plans based on the success of the daily lessons.

Recommendation: Structure introductory computer experiences so novice computer instructors can work as a team to deliver instruction.

o Introducing professionals to additional computer application programs during mini-sessions enabled them to expand their computer skills to other areas of interest.

All twenty professionals finished the course being able to word process and manipulate one data base. The course was structured so that each professional developed a data base application relevant to his/her position. The rehabilitation professionals developed data base applications that would help them in the management of their client activities while the special education teachers developed activities that could be used for instruction of their students. All course participants were required to word process lesson plans and teaching reports which resulted in their completing the course being independent in two computer applications. Research personnel conducted exit

interviews with all course participants. Every professional, upon completion of the course, was able to discuss plans on how they were going to incorporate data base applications and word processing into their future professional plans.

Recommendation: Structure independent projects for course participants to develop individual applications which are directly transferable to their professional positions.

CONCLUSION

This article described a computer training experience which resulted from multi-agency cooperation in the provision of resources. Several implications for preparing educators to deliver computer based training were presented.

The computer lab portion of the CAWE is an excellent example of a multi-agency cooperative effort in education. Resources from IBM, the university, and the D.C. government were all combined to facilitate youth employment potential, professional training, and research in the area of computer instruction for urban youth. With the elimination of any one of these resources, the lab program could not have functioned as effectively. Due to the combination of resources the computer lab served research, professional preparation and youth employment agendas without great expense to any one agency.

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