THE USE OF COMPUTERS IN VOCATIONAL ASSESSMENT

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ABSTRACT: The work of vocational assessors at Seminole Community College is reviewed. Examples of the application of modern computer technology to vocational assessment are offered with examples of computer assisted validity studies, scoring procedures, and report writing. Plans for future use of computer interactive video technology for work evaluation are discussed.

This paper will focus on the computer-assisted aspects of vocational assessment. It will outline various concepts and computer based studies which have been done at Seminole Community College. In some cases these studies have been completed and in others they are still in process, but they all illustrate the significance of computers to vocational assessment's validation, relevance to public education and rehabilitation, and to the control of the costs associated with assessment activities.

The work of the "work evaluator" is that of the scientist (Lingoes, 1979). The scientific challenge of work evaluation is to objectively compare an individual to work demands. Using a computer can offer an evaluator logical precision in this effort. The precision imposed by the computer requires that the evaluator carefully understand the nature of the data which he or she is collecting. In order to best fit information into a computer, that information should be in fundamentally yes/no formats. This is because the computer's intricate system of logic rests on electronic equivalents of yes and no.

There are many questions which can be answered about an evaluee by an evaluator in a yes versus no fashion, yet at first glance these questions may appear much more complicated. For example, task analyses provide clusters of work elements which are put together in work samples. A work sample fits into a computer's logic in the form of a question requiring a decision; e.g., "Can the evaluee successfully perform this work in competitive time?" In order to answer this question the computer may be called upon to sum how many times an evaluator observed a certain evaluee behavior or to keep track of the seconds which have elapsed from the time the evaluee stated working. By doing the above and possibly other logical manipulations of evaluator input, the computer can output scores, graphs, narratives, and whatever a good programmer can engineer.

What about work samples themselves? Can the computer be used to study the psychometric quality of work samples? In a study done at Seminole Community College (SCC) in Florida, evaluators break down their observations of evaluees into a series of yes and no questions. Examples of these questions were: Did the evaluee hold the hammer at the end of its handle without being told? Did the evaluee pick up the pieces of tin without dropping them? Was the evaluee's time to completion faster than 7 seconds?

This humble beginning has led to some startling results. When this effort started, SCC's Work Evaluation program took three weeks, employed 5 Full time staff, and required 7,000 square feet of space. When computers were brought to bear on an analysis of the efficiency of this effort, the procedures were reduced to four days, space to 1000 square feet, and personnel to two. By using computers to analyze evaluator observations in the form of yes or no statements, a good many of the observations were found to be frequently the same for almost all of the evaluees encountered. These items obviously added little to an evaluation report. Based on this analysis, observation procedures were revised.

With tighter control on how and what was observed, the computer was used to study the intercorrelations among the observations which were left. Based on the results of these factor studies, the meaning of the observations was enriched. In those evaluee cases which were tested both with the General Aptitude Test Battery (GATB) and work samples, a computer was used to assess whether GATB scores and work samples data were related. This study encouraged further use of work samples because it was found that work sampling was tapping the same general performance domains as the GATB, yet work samples yielded additional information about work style, test taking attitudes, time related endurance, etc. In this example, computing the relationship between work samples and a well researched, famous psychometric device like the GATB, yielded evidence of work samples' concurrent validity and provided statistical support for the use of work samples.

Anytime there is a great deal of information to be processed, computers are a valuable asset. In the following example from the field of Special Education, the dilemma for the evaluator is to keep track of how many correct and incorrect responses a student gives to tests given at the end of each teaching session; further, this teaching technique, known as Precision Teaching (Fox, 1982), requires a precise counting of how many seconds or minutes it takes a student to complete the response process. At SCC, records for precision teaching are kept on a computer. The computer uses this basic information to calculate the learning rates of each student for each lesson the student attempts. Other statistics regarding the student's improvement and the reliability of the student's response pattern are calculated.

Since precision teaching involves the development of a database on training outcomes and very careful control of intervening variations in the lesson plan and teacher delivery format, the records kept by precision teaching personnel are currently being used in a computer assisted study of the predictive validity of the Work Evaluation program at SCC. This is being done by means of several computer programs which relate work sample scores to learning curve results. For example, a dexterity work sample score is used as a predictor variable in a regression equation on lessons involving the use of the hands (clothing production, dent smoothing, etc.). High scores on dexterity work samples should be predictive of faster learning rates on dexterity based learning tasks.

Stated in the form of testable hypotheses, SCC is in the process of understanding the relationships of work samples scores to learning outcomes. Without computers this important aspect of vocational assessment research would be too costly and time consuming within the context of public education settings.

Besides concurrent and predictive validity studies, the computer has allowed SCC to score work samples in ways that would be far too time consuming if done with a calculator or by hand scoring. Because SCC uses a computer to record sample scores, the computer is available at the point of evaluation. This allows SCC evaluators to input behaviors witnessed during the evaluee's attempt to get through the sample. SCC has developed an instrument called a Work Sample Behavior Checklist (WSBC) which includes a panorama of behaviors witnessed by evaluators over ten years of evaluation experience. By inputting the behavior's code number, the evaluator can attach a given behavioral description to a given work sample score. This easy to do computer programming routine has added an affective dimension to work sample scores. The WSBC allows for easier report writing because it captures "discrete data" in a standardized manner. This information in conjunction with interview results, personality testing, and small group work points out key motivational issues in the evaluee.

During the ten years that SCC has utilized Work Evaluation with vocational and special needs students, literally thousands of evaluation reports have had to be written. This one activity has probably taken more time and effort and been subjected to more public scrutiny than any other aspect of the Work Evaluation process.

Computers have been used to make report writing an easier process which yields interesting and useful information to the teachers and caseworks who read the reports. This has been done in two ways: each time a report was written, records were kept of the evaluee's diagnosed learning or behavioral dilemma. The suggestions made in relation to the dilemma were also recorded. Coding was used to allow computer retrieval of suggestions in relation to specific dilemmas. After at least thirty cases with similar problems were diagnosed, the computer was used to list the suggestions given for the solution of the problems. As this process developed better and clearer relationships to presenting problems, solutions were incorporated in a prescribing catalog. This catalog is keyed to work sample score levels by use of a programming technique known as "three dimensional array". This procedure offers many of the advantages of the prescribing catalog utilized in the Individualized Manpower Training System in Florida with scores from the Tests of Adult Basic Education (CTB/McGraw-Hill, 1967).

The second way that computers have helped in the writing of reports is by use of a widely expanding area of office practice called Word Processing. Interpretive phrases which relate to work sampling scores, observed behaviors, and other aspects of a work evaluation report are given computer code numbers. When writing a report, the report writer can save a great deal of typing time by simply listing the computer codes which relate to the evaluee's performance. The report writer types in the unique aspects of the evaluee's report and then the computer connects and prints out the general coded sections of the report. These two report writing computer assists have been most helpful in getting reports out in time and with less effort.

A new vista for vocational assessment and computers is in the area of computer interactive video. SCC is in the initial phases of making its sample system one which is not only computer interactive, but also one which allows the evaluator and/or evaluee to "travel" through the sample system based on his or her successes or failures.

The journey will start with the evaluator and/or evaluee inputting the case features which are unique to the evaluee (name, address, presenting problem, questions to be answered in evaluation, etc.). The evaluee will start with a broad sample challenge which is designed like a preliminary talent assessment. Based on the evaluee's experience on this locator challenge and on the probability tables in the computer's memory, the computer will assign the next sample challenge. This process continues until the evaluee exhausts the samples which he can and wants to do. The computer will then go to the report writing mode outlined above.

The journey through samples will involve a process similar to The Singer Company (1979) in which pictures, sound, and tactile stimulation will help the evaluee understand what to do. The difference will be that instead of sound/slide, the computer will call up video segments of instructions from an interactive video disk. This will bring together the communication power of television with the wide spectrum of talent assessment capabilities of vocational assessment.

In summary, computers and vocational assessment are logical partners in testing and curriculum planning for special needs and vocational students. Computer based simulations have revolutionized training and testing in the military and industry, and now they are changing education and rehabilitation. There is little doubt that computers and vocational assessment have changed the dominance of verbal and written testing for special needs populations, and that the future will open up new and better ways to understand special students and their unique training needs.

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EMPLOYMENT THROUGH REHABILITATION TECHNOLOGY AWARENESS: A MULTIDISCIPLINARY APPROACH

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ABSTRACT: Rehabilitation engineering efforts have resulted in many new devises that can be used by persons with disabilities. This explores the ways that these technological products can be used by and for handicapped youth.

As a natural outcome of any sustained engineering effort, rehabilitation engineering has resulted in a large offering of new technology for the needs of the disabled. In addition to the products of special rehabilitation engineering centers funded nationally by the national Institute for Handicapped Research, there also exists on the market a wide range of commercial products. One need only visit the exhibit section of any national conference dealing with technology and the disabled to discover the expanse of this commercial industry and also sense its growth. For professionals in the field this means an ever increasing variety of aids and devices to overcome the handicapping conditions in almost any physical environment. This paper is concerned with the promise those technologies hold as a possible starting point for linking various professionals to meet the needs of handicapped youth. In this paper, it is also recognized that most barriers to successful vocational preparation of handicapped youth are not just barriers in the physical sense. It is hoped that special educators, vocational educators, vocational rehabilitators, and potential employers will be able to apply new technologies in simple, efficient ways to remove design barriers in learning and working environments. These professionals may have a common interest in technology because of their technical and industrial backgrounds. By solving problems through technology, it is hoped that multidisciplinary teams can go on to solve more intricate and less tangible issues dealing with employability, issues such as behaviors and attitudes. After all, employability is the one key factor needed to link a transition from school to work.

Just as a work site or job station in industry is modified to allow use by a disabled individual so must learning sites or environments be modified to meet special needs. As training in industry (sheltered