

Refereed Articles

Job Trails: A Computer Based Skills Assessment in Five Job Domains

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Abstract

Job Trails combines functional context literacy with the use of computers. It was pilot tested in 22 sites in Pennsylvania. The goal of the pilot testing was to answer the following questions:

1. Can a functional context computer assessment be integrated into existing adult education programs?
2. Will adult learners respond positively to the assessment?
3. Will this assessment help adult learners understand the basic skills they need to improve to prepare for employment?

Adult learners and instructors responded favorably to *Job Trails*, and responses from both groups during the pilot testing indicate that the assessment could be integrated into programs.

Introduction

In 1990 President Bush and the nation's governors adopted six education goals for the year 2000. Goal Five is: "Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship" (National Education Goals Panel, 1991).

According to *America 2000: An Educational Strategy* (1991), the present-day potential workforce includes many functioning at a level too low to qualify for entry level positions. School reform would not solve the problems faced by those individuals who are already out of school, and whose basic skills levels are inadequate for employment—individuals who now may find welfare their only way to support their families.

Preparing individuals for employment is imperative both at the individual level and at the state and national level. For Pennsylvania and the United States to compete economically, the workforce must be adequately educated and trained. The question remains: How to best reach individuals with low to marginal skills?

Adult learners must be brought into an educational program and remain long enough for gains to occur. Quigley (1991) found that a major reason for non-participation of adults in education programs was that the adults had memories of past failures in school. An adult education program might be more successful if it differs from the traditional school experience.

A functional context literacy approach has been advocated as a method by which basic skills can be presented to adults in a way differing from the methods used in public schools. Functional context literacy research shows that integration of basic skills in a vocational context will increase the employability of the student (Sticht, 1987). Burghart and Gordon (1990) compared the effects of functional context programs and traditional programs in educating minority women with many barriers to employment. One program used an integrated model connecting job skills with basic skills; the other programs were run traditionally. After following the case histories of 4,000 women for six years, Burghart and Gordon found that the integrated program had a large positive impact on employment and earnings, while the other programs showed no corresponding significant impact.

Another promising trend in providing adult literacy instruction is the use of technology; recent research indicates technology-aided education can be extremely successful (Askov, 1986; Askov, Maclay, & Bixler, 1987; Brown, 1990; Maclay & Askov, 1987; Maclay & Askov, 1988). An extensive evaluation of computer-based instruction (Turner & Stockdill, 1987) shows that computers offer a "face saving" way to learn basic skills effectively and efficiently. While technology may be responsible for the loss of jobs, it may also offer the means of upgrading individuals' basic skills and enable them to find or improve employment. The computer offers the advantages not only of privacy and self-pacing, but also of familiarity with computer operations--especially when instruction is designed to fit the context of workers' needs in their present and future job situations. Comfort with computer operations enables an individual to progress more rapidly in a training program that requires use of computers (Askov & Turner, 1989).

Development of Job Trails

A newly developed basic skills assessment, *Job Trails*, combines functional context literacy with technology. It is a job-specific computer assessment at the mid-literacy level (reading grade level 4-8) in reading, writing, and math. The assessment addresses job-related basic skills in five job domains and is targeted for adults who have entry-level jobs or who aspire to obtain these jobs. The five specific

job domains represented in *Job Trails* were identified to be among the fastest growing entry-level jobs in Pennsylvania. These are health care, clerical, food service, retail sales, and maintenance.

To determine basic skills needs of entry-level employees, basic skills task analyses were performed for each selected job domain. This was accomplished by visiting job sites, interviewing supervisors, collecting forms and manuals, and reviewing training materials.

Questions were programmed on an Apple MacIntoshtm using Authorware Professionaltm and transported to an IBMtm. These analyses served as the basis for the development of the computer-assisted assessment materials. Activities which simulated real life tasks were developed by connecting individual tasks identified by the task analyses with accepted basic skills activities. The material is presented in the form of an assessment, with specific feedback given after each activity. If answers given by users are correct, they are told that they have given the correct answer and are given a reinforcing comment. If the answers are incorrect, the correct answer is given and the adult learners are shown an explanation of the problem.

Although the questions resemble tasks to be completed on the job, they are actually measures of the users' basic skills. All questions are keyed to Workplace Basic Skills Competencies developed by CASAS, a California-based, nationally validated adult education curriculum management system.

Adult learners using *Job Trails* have complete control of their progress through the courseware; the units and subunits can be completed in any order. Users can stop at any time, sign off the computer, and then pick up where they left off. Information concerning the users' progress, automatically collected on a student data disk, includes the units and subunits completed, all answers to essay-type questions, and users' basic skills scores. This information can be easily retrieved by the instructor from the *Job Trails* main menu.

When the user has completed *Job Trails*, they or their instructors can print a diagnostic chart which includes a list of the basic skills assessed in the tasks completed by the user and how well the user performed on each basic skill. If the user scores below 85 percent on any basic skill, the program automatically prints a list of print-based materials that target that basic skill.

Pilot Testing

Job Trails was installed on computers in 14 different Pennsylvania agencies in a total of 22 different sites. The goal of the pilot testing was to answer the following questions:

1. Can a functional context computer assessment be integrated into existing adult education programs?
2. Will adult learners respond positively to the assessment?
3. Will this assessment help adult learners understand the basic skills they need to improve to prepare for employment?

Over 100 adult learners used *Job Trails* at the pilot sites; 79 adult learners completed questionnaires concerning their use of the program. Twenty-four instructors were trained in the use of *Job Trails* and were interviewed at least once. Twelve instructors completed six-page questionnaires. The pilot site programs included basic literacy programs, adult basic education programs, and G.E.D. programs, so the functioning level of adult learners using *Job Trails* depended on the type of program. *Job Trails* was placed in a wide variety of environments: rural areas, small towns, suburbs, and urban areas. Pilot sites included school districts, intermediate units, Service Delivery Areas, and rehabilitation centers. Adults with disabilities were served in two sites.

Project staff installed *Job Trails* on site computers and gave initial training to all site staff. As changes were made in *Job Trails*, updates were installed and further training was given. Trainers encouraged site staff to call the institute with any questions or problems they had. Staff visited each site many times to interview instructors and adult learners and to have both groups complete questionnaires.

Institute staff modified *Job Trails* several times during the pilot testing in response to information gathered.

Results

Results were obtained through interviews with and questionnaires completed by instructors and adult learners. A minimum of one visit was made to each site after initial training. In most cases at least three visits were made to each site. Instructors and adult learners were interviewed multiple times.

Can a functional context computer assessment be integrated into existing adult education programs?

The ultimate goal of many of the pilot sites was future employment of adult learners. Even in cases where the instructional format of the pilot site did not involve functional context techniques, *Job Trails* was successfully used.

In one program, the adult learners were functioning at a reading level lower than the targeted level. At this site, tutors sat with the adult

learners as they proceeded through the program. The reports from the instructors and the adult learners from this site were positive. At sites where the adult learners were functioning at a level higher than the *Job Trails* target, the results were mixed. Some adult learners found the program interesting because it gave them insight into what they might have to do on the job. However, one adult learner who moved through the program quickly and easily reported that he already knew all the material and that it was "a waste of his time." This particular adult learner had earned his GED and was already functioning at a high level of basic skill attainment.

In general, comments on the questionnaires completed by the instructors and adult learners were positive, especially those completed after the fourth version of *Job Trails* was in use. The instructor questionnaires addressed the following: learner/computer interaction; learner control; screen design; content; and administration. On the instructor questionnaires, the most positive response for each question received a score of 1, and the least positive response received a score of 4. Questions on learner/computer interaction received an average score of 1.85; learner average score was 1.92; screen design average score was 1.98; content average score was 2.00; and administration average score was 1.67. The least positive comments came from pilot sites with adult learners whose skills were above target, which confirms that this particular assessment does not work as well with those who are already performing above its level.

Will adult learners respond positively to this form of assessment?

The responses of adult learners to questionnaires and to interviews provided the information used to answer this question. In all, 79 adult learners completed questionnaires measuring their attitude toward *Job Trails*. Two separate questionnaires were administered: a 24-item questionnaire completed by 50 adult learners who used one of the first three versions of *Job Trails*, and an 11-item questionnaire completed by 29 adult learners who had used the final version of *Job Trails*. In most pilot sites, the questionnaires were read to the adult learners as they completed them. The first questionnaire primarily included questions aimed at the refinement of the *Job Trails* program. The second questionnaire also contained questions aimed at the refinement of the *Job Trails* program, but was primarily a summative evaluation instrument.

When asked on the first questionnaire, "Which would you rather do, take a written reading and math test or use *Job Trails*?" 44 of the 50 respondents stated that they would rather use *Job Trails*. What was

surprising, however, was the unwritten response to the question when it was read to the adult learners; most did not look at *Job Trails* as a "test" but as "something I would do when I work." One adult learner argued that there was no math in the clerical module. When asked about the sections in which she had to complete an invoice, including computing sales tax and finding the total, she said, "That's not math. That's what I would do at work." When she was asked what "math" was, she answered, "That's the rows of problems you have to do in a book."

To the question, "Did you enjoy using *Job Trails*?" 39 adult learners responded, "Yes"; 10 responded, "Maybe Yes"; 0 responded, "Maybe No"; and 1 responded "No." In interviews, even when adult learners pointed out troublesome program areas, they reported that they enjoyed using the program.

Will this type of assessment help adult learners understand the basic skills they need to improve to prepare for employment?

The answers to this question was obtained through the questionnaires and interviews; two questions on the first, formative questionnaire related to this topic. To the first, "How much do you know about your job area before you used *Job Trails*?" 10 learners responded, "A lot"; 26 responded, "Some"; 10 responded, "A little"; and 4 responded, "Nothing." To the second question, "How much do you know about you job area after using *Job Trails*?" 32 learners responded, "A lot"; 8 responded, "Some"; 8 responded, "A little"; and 2 responded, "Nothing." In the second, summative questionnaire, two statements measured adult learners' perceptions of how much they learned about their job area. To the first, "*Job Trails* helped me know the reading, writing, and math I would do in a job," 16 learners responded, "Yes"; 11 responded, "Maybe Yes"; 1 responded, "Maybe No"; and 0 responded, "No." To the second statement, "I understand job duties more after using *Job Trails*," 18 learners responded, "Yes"; 10 responded, "Maybe Yes"; 1 responded, "Maybe No"; and 0 responded, "No." These responses indicate that the adult learners believed that the computer-assisted assessment helped them learn more about the skills they would need on a job.

Some written responses to the question, "What was the best thing about *Job Trails*?" also add insight into the perceptions of the adult learners. A woman at a rehabilitation center wrote: "It helped me learn about the clerical profession [*sic*] and it will make my learning just a little easier." A woman for whom English is a second language wrote: "What I like best about *Job Trails* is that it helps me understand what type of jobs I would need to know concerning clerical."

Conclusions

Instructors and adult learners can be helpful in the development of a computer-assisted, functional context assessment.

The instructors and adult learners in the pilot sites were active participants in the formative evaluation of *Job Trails*. Their comments and ideas led directly to changes in the program which made it substantially more usable.

A computer-assisted, functional context assessment was successfully used in a variety of adult basic education programs.

Job Trails was pilot tested in 22 different sites. The variety of environments included adult learners who were on welfare, the disabled, the deaf, and learners for whom English was a second language. Reports from the various programs were favorable. Reports from urban areas did not differ from reports from rural areas. Instructors of individuals who are disabled found the program just as useful as other instructors; adult learners with disabilities could successfully use *Job Trails* and were enthusiastic about the program. It was successful with high level ESL students.

The full potential of Job Trails is not yet known.

During this project, *Job Trails* underwent many modifications in response to information collected in the first, formative evaluation. Several versions of the program were installed in site computers and tested. The latest version of the program has additional new features. It was installed in April and May, 1991, but has not been on site long enough to collect sufficient data to determine its full impact. More research is needed to fully assess the impact *Job Trails* has on programs and adult learners, and longitudinal data will be necessary to determine if the package made significant differences in the training and employment of users. Even so, the preliminary data show that computer assisted, functional context assessment is useful in adult basic education programs, and is readily accepted by both instructors and adult learners.

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