Use of a Microcomputer with Residents and Staff at a State Institution Serving Mentally Retarded Persons

Mary Lou Lyon

The lack of appropriate leisure skill opportunities for adult residents at large state residential facilities is a well documented problem (Baker, 1980; Ingalls, 1978). Because this group of residents is predominantly older, fewer and fewer materials marketed for leisure or play time can be used by them, considering their handicapping conditions and developmental status (Certo, Schleien, & Hunter, 1983). The dilemma rages because games, books and toys made for adults are most likely too complex and therefore not fun, while materials for children are not appropriate for adults and may quickly lose their appeal.

One possibility for increasing leisure skills opportunities is through the use of microcomputers. In the student library at Murdoch Center in Butner, a Commodore 64 microcomputer has been made available to all residents on campus. For the past six months, efforts have been made to encourage use of the microcomputer with announcements in several campus newsletters and an active "spreading-of-the-word" by enthusiastic participants.

But why computer training with mentally retarded residents? Computers fit many of the desired qualifications for leisure skill activities: age-appropriate, non-edible, able to increase or decrease in level of difficulty, multi-sensory (visual, tactile, auditory), non-sexist, safe and fun. Other advantages of using computers versus people as a diversion are immediate feedback and the computer's limitless patience.

There has not been much effort made to work with persons who are severely handicapped using computers due to the inaccessibility of machines, the complexity of operation and the lack of available programs which are feasible for a severely physically or mentally retarded group. With recent technological advances, special devices are now becoming available which make computers more accessible to even the most physically handicapped persons. For instance, special devices allowing a person to operate the computer with a push button switch, blow switch or infra-red detector are on the market. In addition, computers can be programmed to talk with an electronic female or male voice and adapted with raised braille dots, making it accessible to persons who are blind (Keating, 1984). Many more programs are also being developed for all ages and ranges of ability, making the selection of games and activities which can be used for fun and teaching on the computer more diverse.

The purpose of this study was to help evaluate the potential applicability of computer use with residents at Murdoch Center. Classes were arranged with a number of residents to begin computer training on a weekly basis. Students ranged from 18 to 72 years, with classifications from quadriplegic and profoundly mentally retarded to moderately retarded and behaviorally disturbed.

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The goals established for the computer programming at Murdoch Center included:

1. The expansion of leisure activity opportunities for residents;
2. An increase in the amount of time residents will spend interacting with an object;
3. The provision of a reinforcing stimulus for residents;
4. An increase in residents' overall skill development (e.g., visual acuity, fine and gross motor dexterity, receptive communication, etc.);
5. The encouragement of social interactions between residents and between residents and staff; and

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6. An increase in the general use of the Student Resource Library.

There were six students who participated in the project. Residents involved in the computer training sessions finished the program at varying stages of mastery; however, all made degrees of progress and appeared to enjoy the work. Data was kept on their weekly performance to help assess the methods of training and the applicability of the selected programs.

An important factor in working with handicapped persons is documenting their medication status (Poling, 1983). Residents at state institutions are often found to be on various substances for controlling such problems as seizure activity or aggression. These medications in turn can have a profound effect on the person's behavior, depending on such things as tolerance, amounts and drug interaction effects. Drug information on each subject was documented for the duration of the project.

Method

Presented are profiles of two of the subjects involved in the study. Though one subject was higher functioning than the other, both were able to operate and enjoy the use of at least one program on the microcomputer after training. Medication histories for the subjects during the study are also included.

Subject 1. Joan was the oldest female student who participated. She has been a resident of Murdoch Center since 1964 and is 53 years old. Her classification includes severe mental retardation, spasticity and moderate diplegia (paralysis). She also has a visual impairment, most pronounced in one eye.

In reviewing Joan's records for the computer programming period, her medications were found to include a potassium supplement given every day, one cap daily of Diazone and 45 cc's of Milk of Magnesia.

Before computer programming began, Joan was evaluated and found to have adequate fine motor control to press individual buttons on the computer in several locations, with some consistency. Her attending behavior was good, and she appeared to enjoy social contact and verbal praise.

Subject 2. Jerry is a 22-year-old, moderately mentally retarded male with a behavior disorder and classification of psychopath. He had been incarcerated in a number of residential facilities before being admitted to Murdoch Center in 1983.

Jerry's teachers were particularly interested in expanding his classroom and leisure skills activities, due to his generally restless behavior and tendency to create trouble when not actively involved in structured situations.

His medications at the time of programming included a daily dose of Colace, and 75 milligrams of the anti-psychotic drug, Mellaril.

Jerry was a motivated student and quickly mastered the rudimentary procedures necessary to operate the computer. Although there were instances where he regressed into "baby-talk" or inappropriate touching behavior, Jerry's overall behavior was exemplary during class periods, indicating his desire to continue in the programming.

Setting

Classes were conducted in the Student Library on campus. The library, located in the Rehabilitation Services Building, is centrally located on the Murdoch Center Campus. The library is housed in a large room on the main floor and the computer, monitor and computer programs are situated at desks in the back right hand corner.

Procedure

For the computer classes, each student met for individual work at various times between 8:30 AM and 4:30 PM, Monday through Friday, depending on their personal schedules. Each class period lasted for approximately thirty minutes.

Training with each student began with an identification of the parts of a microcomputer. Next the student was asked to assist in retrieving the program, inserting the disk into the disk drive and turning on the various parts. Depending on the physical and mental abilities of the student, the program selected was then adapted to a level which would make the computer work challenging but not impossible.

The program selected for training in this project was "Build a Face" (Quinn & Weinstein, 1982). The choice of the game as the training tool was based on the following criteria: (1) the game was suitable for adults; (2) it had simple rules; (3) it required the use of only a few keys on the computer keyboard; (4) it could be played by persons with limited motor movements; (5) it was visually attractive, and (6) it had interesting responsive reactions.

To begin the training the student was checked on the program task analysis sequence to find the step where instruction should begin. The

task analysis for the "Build a Face" program is presented in Table 1.

Results

Systematic data was kept on Section C (see Table 1) of the task analysis for each subject. Though Sections A, B and D were part of the instructional sequence during each class session,

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TABLE I
Task Analysis for playing the Microcomputer Program, "Build a Face"

A. Identifying and Readying the Computer
   1. Identifies a disk
   2. Identifies the disk drive
   3. Identifies the monitor
   4. Identifies the computer
   5. Selects the "Build a Face" program
   6. Removes disk from sleeve
   7. Inserts disk into disk drive and closes door
   8. Turns on disk drive
   9. Turns on computer
   10. Turns on monitor
B. Loading the Computer Program
   11. Wait for the word READY to appear on the monitor screen and type LOAD "*", 8 on the keyboard
   12. Press the Return key
   13. Wait for the word READY to appear on the monitor screen and type RUN on the keyboard
   14. Press the Return key
C. Playing the "Build a Face" game

15. Press 1	(to build face)
16. Press return	(to see list of features)
17. Press space bar 1 time	(to select mouth)
18. Press return	(to see mouth choices)
19. Press space bar 1-8 times	(to select a particular mouth)
20. Press return	(to see list of features)
21. Press space bar 1 time	(to select eyes)
22. Press return	(to see eye choices)
23. Press space bar 1-8 times	(to select particular eyes)
24. Press return	(to see list of features)
25. Press space bar 1 time	(to select ears)
26. Press return	(to see ear choices)
27. Press space bar 1-8 times	(to select particular ears)
28. Press return	(to see list of features)
29. Press space bar 1 time	(to select nose)
30. Press return	(to see noise choices)
31. Press space bar 1-8 times	(to select particular nose)
32. Press return	(to see list of features)
33. Press space bar 1 time	(to select hair)
34. Press return	(to see hair choices)
35. Press space bar 1-8 times	(to select particular hairdo)
36. Press return	(to see created face)

D. Turning off computer
   37. Turns off monitor
   38. Turns off computer
   39. Turns off disk drive
   40. Opens disk drive door and removes disk
   41. Replaces disk in sleeve
   42. Returns disk to shelf

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the abilities of students to accomplish these steps were quite varied. Thus adaptations were necessary, making comparisons among students difficult.

Data for Section C was analyzed using the percentage of steps completed independently during the programming sessions. As can be noted in Figure 1, Joan's performance level during baseline was very low, indicating her lack of prior exposure to microcomputer application.

After the intervention training, however, she demonstrated relatively stable gains in skill levels over the next five sessions. By the sixth session she was playing at least half of the program inde-
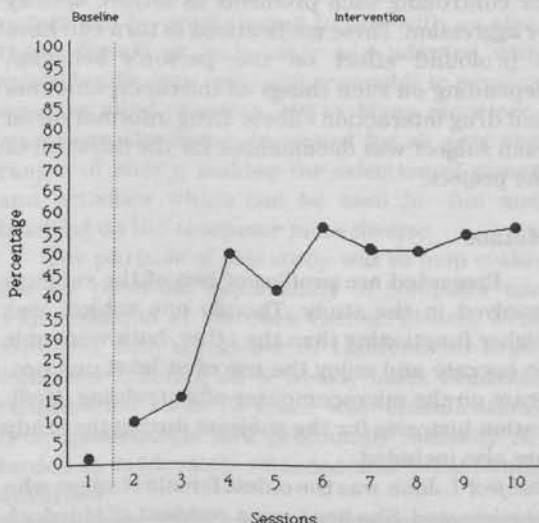

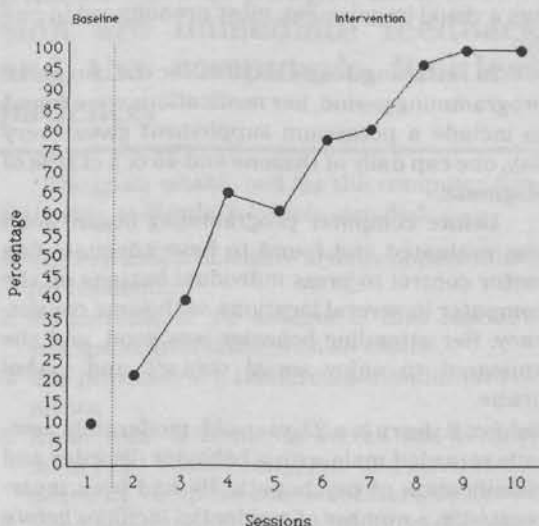Figure 1. Data for Joan across the ten sessions of the computer training.

Figure 2. Data for Jerry across the ten sessions of the computer training.

pendently, which was the rate she maintained for the remainder of the sessions.

Jerry's data for Section C shows a steady progression throughout the sessions. As stated previously, he wanted to learn and worked hard during each class period to please himself, the instructor and the unit staff who attended with him. He also displayed good retention particularly between sessions 3 and 4, as did Joan, where scores were greatly improved.

As Jerry's scores improved tremendously around the eighth session, he was asked to begin concentrating on the amount of time it was taking him to finish playing the game. Because he was able to speed up his work on Section C and make perfect scores for sessions 9 and 10, he was allowed to play other games of his choice during part of those class periods.

Both Joan and Jerry appeared to enjoy their microcomputer classes, as demonstrated by their anticipation of the sessions and their reminders to staff when classtime was approaching. They also acknowledged when asked, that playing on the microcomputer was a favored leisure skills activity.

Conclusions

The purpose of this study was to determine the extent to which institutionalized, mentally retarded adults could learn to play a game on a microcomputer, and whether work on the computer would become reinforcing and a leisure skills activity the residents would request. Using a task-analyzed instructional sequence based on a particular computer program, students were taught to identify parts of the computer. In addition, they learned how to turn the computer on and off, and how to play all or part of a selected computer game.

Results of this study support previous research findings demonstrating the ability of severely handicapped and mentally retarded persons to expand their leisure skills opportunities through the use of systematic behavioral teaching techniques (Schultz, Vogelsberg, & Rusch, 1980; Matson & Marchetti, 1980; and Schleien, Muccino, & Certo, 1984). The study further demonstrated that work on the microcomputer can be considered an appropriate leisure skills activity for an institutionalized population.

The importance of leisure skills opportunities for residents of state institutions is emphasized. By substituting positive leisure skills activities during residents' free time, negative behaviors have shown to be reduced (Horner, 1980; Wahler & Fox, 1980). The increased availability of such

Jerry works on the "Build a Face" program.

materials as suitable books, games, microcomputers and record players would greatly enhance the existence of life for those at residential facilities. At Murdoch Center, these and other items are being offered with assistance at the Student Library. Further research is needed to identify other appropriate computer games and sources of recreation which would lead to an increase in the desirability and use of libraries at all residential facilities in North Carolina.

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