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ABSTRACT

Community-referenced activities, which involve combinations of skills used in routine tasks of daily living, are critical for the independent functioning of moderately and severely handicapped persons. The paper examines the characteristics of these activities in order to extract implications for enhancing instruction. The tasks involved in such community-referenced mathematics activities as grocery shopping and using a vending machine are analyzed in the context of: (1) the length of the task (i.e., number of steps involved); (2) the responses contained in the task (e.g., motor responses, verbal responses, math skills); and (3) variations within the task, which may require a generalization training approach. (JDD)

Community-Referenced Math Activities for Moderately and Severely Handicapped Individuals

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Running head: COMMUNITY-REFERENCED MATH ACTIVITIES FOR MODERATELY AND SEVERELY HANDICAPPED INDIVIDUALS

Abstract

Community-referenced activities involve combinations of skills used in routine tasks of daily living (e.g., purchasing food; counting and bagging items in a vocational task). These tasks are critical for the independent functioning of moderately and severely handicapped persons. Consequently, community-referenced activities that will be performed upon exiting school should form the basis for functional instruction with these populations.

Community-referenced instruction differs in numerous ways from typical tabletop instruction. In order to extract implications for enhancing learning/teaching, the length of the task, responses within the task, and variations of the task will be analyzed.

Community-Referenced Math Activities for Moderately and Severely Handicapped Individuals

Community-referenced instruction reflects the belief that education for individuals with moderate to severe handicaps is only appropriate when the knowledge and behaviors that the students acquire become part of their daily routine in integrated environments (Brown, Branston, Hamre-Nietupski, Pumpian, Certo, & Gruenewald, 1979; Horner, Mc Donnell, & Bellamy, 1986). This thinking is intuitively and practically appealing. Service delivery and subsequent participation of handicapped persons should be provided in environments that are as normal as possible (Wolfensberger, 1972). In practice, the individual will not only learn a skill, but also learn the context in which to use it (Guess & Helmstetter, 1986).

This more recent shift to a community-referenced skills curriculum raises the issue of the relevance of current instructional procedures. Community-referenced activities involve skill clusters which may be extended over time and/or intertwined with collateral skills (Snell & Browder, 1986). For instance, in the course of using a vending machine in the natural environment, money, social, language, and reading skills might be involved. Such complex tasks differ in numerous ways from typical classroom activities.

Consequently, careful instructional arrangements are important since individuals with severe handicaps characteristically learn more slowly and since community-referenced activities are an instructional priority for these individuals (Wilcox & Bellamy, 1982).

To examine the adequacy of existing teaching strategies, the nature of community-referenced activities requires closer scrutiny. The intent of this article is to analyze the characteristics of these activities in order to extract implications for enhancing instruction. This discussion may produce a more deliberate selection of procedures that are applicable for use with community-referenced activities. The rationale is based upon the assumption that the goal for the learner is to perform these tasks without teacher assistance in the natural environment.

The Nature of Community-Referenced Activities

Activities for community living consist of those that occur routinely in the lives of most persons (e.g., housekeeping, recreating, shopping, working). All of these activities have functional relevance. To organize this examination of a broad range of activities, three important characteristics will be considered: (a) the length of the task; (b) the responses contained in the task; and (c) the variations within the task. Within each area, implications for teaching will be drawn.

The Length of the Task

Some tasks have a distinct beginning and end. For example, counting ten items for packaging in a vocational assembly task usually involves performing a set of responses. When the task is completed, it is repeated to assemble the next unit of work. By contrast, shopping has quite a different set of responses. When a proficient shopper buys groceries, he or she may (a) make a list at home, (b) travel to the store, (c) buy items on the list at the store, (d) travel home, and (e) put away the groceries. Which of these activities constitute grocery shopping? The few studies on teaching grocery shopping have focused on the purchase phase of this activity as an initial goal (Matson, 1981; Mc Donnell, Horner, & Williams, 1984. Independent use of this skill will also require planning, traveling, and storing skills.

Table 1 provides an example of a community-referenced math-related activity which has been analyzed into its component parts. This kind of detailed analysis of the

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Insert Table 1 about here.

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sequence of behaviors needed to complete the task is beneficial in developing lessons and guiding students to systematically reach the objective.

Teachers have several options for determining the behaviors that will be selected for initial instruction for

students with limited current skills, including:

1. Teach all steps in the task during each instructional session.
2. Separate instruction into "chunks" and teach one "chunk" (e.g., Steps 4, 5, 6, 7, 8, and 9 involving the use of money). This approach may be easier to schedule into shorter instructional sessions; however, moderately to severely handicapped students may not learn the entire set of behaviors until the chunks are linked in instruction.
3. Use isolated massed trial training for the particularly difficult steps of the task (e.g., Step 5 - Select necessary coins.) This may facilitate acquisition of these steps; however, students may also need further instruction to generalize performance of these steps into the whole activity of using a vending machine during a break.

The Responses Contained in the Task

In traditional instruction, teachers often divide a teaching schedule into training times for language, math, motor, and so forth. Community-referenced instruction has often been treated as an adjunct to this listing. However, the sets of behaviors required in community living contain all the traditional categories of instruction. For example, motor and verbal responses are embedded in the activity of grocery shopping. The grocery shopping chain requires

strength and coordination to push a shopping cart (i.e., gross motor skills), initiative and control in asking for sandwich meat at the Deli department and standing in line without drawing negative attention from others (i.e., communicative and social skills), and money skills to purchase grocery items. To maintain the flow of instruction in the community, skills are taught as they naturally occur within the activity. That is, simultaneous instructional programs are used to teach the collective skills of the activity. This type of instruction emphasizes the contextual and interrelated use of skills in naturally occuring activities.

In Table 2, the task analysis illustrates the varied responses that are incorporated within a natural community-referenced activity. For example, language training is included (e.g., Steps 6 to 9), new motor responses are trained (e.g., Steps 1, 11), and math skills are instructed (e.g., Steps 15, 16, 17, 18, 19, and 20). While purchasing a snack need not require conversation skills, these skills enrich this experience and are typical of a nonhandicapped person's behavior in this type of setting.

Insert Table 2 about here.

Teachers may select several strategies to expedite learning for moderately or severely handicapped persons, including:

1. Highlight natural cues such as the hostess saying, "Follow

me, please" or the waitress asking, "What would you like?"

2. Adapt materials to facilitate responding such as pictures in a wallet to aid conversation or single dollar bills to simplify counting.
3. Use prompts to tell, show, or guide student responding.

Variations within the Task

Beyond the numerous and varied responses required in a community-referenced activity, the task may also vary due to naturally occurring changes in the environment. For example, the grocery store may get a new type of grocery cart or a product may change in label. Response demands, too, may vary. Within the store, different sections require counting produce, ordering lunchmeat, selecting canned goods, and so forth.

When generalized responding (i.e., responding reliably across the range of natural environments and situations that the student encounters in his or her daily activities) is sought, efficient and effective procedures for teaching generalization are critical (Horner et al., 1986). Horner and his colleagues have used a generalization training approach called "general case instruction" (Horner et al., Mc Donnell et al., 1984). In this approach, variation is defined by identifying the many conditions that cue the new behaviors. For example, Mc Donnell et al. (1984) trained payment skills at cash registers and checkout counters in all

the grocery markets in Eugene, Oregon. The instructional universe included 100 markets with 4 general types of cash registers. Teaching examples that circumscribed the range of variations the student would encounter satisfied generalized responding. However, researchers need to determine how efforts can be streamlined to minimize such large investments of resources.

In Table 3, the variation within one type of activity is illustrated with examples of purchasing a meal or snack. As described, generalization skills to cope with this variation may be facilitated with training many examples.

Insert Table 3 about here.

To facilitate generalization, teachers might consider the following suggestions:

1. Provide instruction in the community at the various types of food service facilities.
2. Identify the variations the student would encounter and plan contrived, in-class instruction to reflect this sample.

Conclusion

The importance of the characteristics of community living activities is that they have implications for determining curriculum and developing instruction. If community living instruction is to move beyond teaching limited independence, entire activities need to be considered as

the "complete" goal. To improve acquisition, teachers need to analyze the math, language, and other collateral skills that combine to form community-referenced activities. Teaching strategies must be modified to accommodate the length of these activities and careful selection of training examples must be made to facilitate generalization. As the focus of community living instruction moves into true independent functioning in community settings, it becomes clear that curricular and instructional approaches should be reexamined.

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TABLE 1

A Task Analysis for Using a Vending Machine at Break Time

1. Approach vending machine area.
2. Locate soda machine.
3. Scan selections.
4. Take out change.
5. Select necessary coins.
6. Insert coins.
7. Push selection.
8. Collect change (if necessary).
9. Put change in pocket/purse.
10. Pick up soda can.
11. Remove soda tab.
12. Lift can opening to mouth.
13. Drink soda.
14. Greet friend.
15. Continue drinking.
16. Converse with friend.
17. Discard soda can.
18. Return to work area.

TABLE 2

A Task Analysis for Ordering a Snack with a Friend

1. Open door.
2. Wait for hostess.
3. Follow hostess to seat.
4. Slide in booth seat.
5. State order to waitress.
6. Acknowledge friend.
7. Initiate conversation.
8. Maintain focus on friend.
9. Reply to friend's comments.
10. Open straw.
11. Drink soda.
12. Squeeze catsup on fries.
13. Eat fries.
14. Finish soda.
15. Read check.
16. Take out money.
17. Leave tip on table.
18. Locate/Walk to cashier.
19. Pay check.
20. Collect change.
21. Replace change and wallet.
22. Exit.

TABLE 3

Examples of Setting Variations in Purchasing a Snack

Chain 1-Self Service	Chain 2 - Cafeteria Style
1. Walk to counter.	1. Wait in line.
2. Select food item.	2. State order.
3. Walk to cashier.	3. Pay cashier.
4. Wait in line(if necessary).	4. Wait for tray with food.
5. Pay cashier.	5. Take food to table.
6. Leave store with food.	

Chain 3 - Fast Food	Chain 4 - Hostess Seating
1. Wait in line.	1. Wait for hostess.
2. State order.	2. Follow hostess to table.
3. Pay casher.	3. State order to waitress.
4. Wait for tray with food.	4. Eat food at table.
5. Take food to table.	5. Wait for check.
	6. Leave tip.
	7. Locate/Pay cashier.