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MODELING AS A
PREVOCATIONAL HORTICULTURAL TRAINING METHOD
WITH TRAINABLE MENTALLY RETARDED ADULTS

by

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INTRODUCTION

Horticulture is a recognized vocation for the mentally retarded (Hiott, 1975). Horticultural training techniques used in vocational programs have been acquired from educational and vocational programs. Task analysis and behavior modification are being successfully adapted for vocational horticultural training (Copus, 1980; Morris, 1978).

Most human behavior is acquired through imitating a parent, teacher, or appropriate model. Imitative learning (modeling) is usable in teaching mentally retarded subjects correct horticultural vocational skills. Litton (1978) suggested that the ability to imitate or "do as the model does" is essential to learn most of the social and academic behaviors outlined in a mentally retarded curriculum.

This study used modeling, with verbal instruction and repetition, as a training technique in a prevocational training program for trainable mentally retarded. Language and work skills of subjects were evaluated using a Horticultural Evaluation Test.

The results of this study were prepared for publication in The Journal of Mental Deficiency.

Horticulture has been an effective tool for centuries in the rehabilitation and therapeutic treatment of institutionalized individuals (Tereshkovich, 1973). In 1899, E.R. Johnson cited the value of gardening in working with mentally retarded children (Copus, 1980). More recently, P.D. Hefley (1973) cited the following benefits of horticulture for the retarded: (1) Intellectual benefits: attainment of new skills; improved vocabulary and communication skills; an aroused sense of curiosity; increased powers of observation; vocational and prevocational training; stimulation of sensory perception. (2) Social benefits: interaction within a group; interaction outside a group. (3) Benefits of emotional growth: improved self-confidence and self-esteem; opportunities for release of aggressive drives; enthusiasm for the future through interest-promoting activities; opportunities for satisfying creative drives. (4) Physical benefits: development and improvement of basic motor skills; increased outdoor activities.

Special educators and vocational instructors should consider horticulture as a media of vocational training for the mentally retarded adult. Horticulture provides a broad spectrum of vocational skills from the job entry level (requiring such simple skills as watering and fertilizing), to a maintenance level (pruning and transplanting) and eventually to work in a horticultural business (greenhouse or landscape/lawn service). Regardless of a person's

skill level, the varying degrees of job entry skill requirements would provide a disabled individual with an opportunity for initial employment. Horticultural work is adaptable to the type or degree of disability, and more important by the person's willingness to work and contribute to the success of the business (Frith, 1981).

Jordan and DeCharms (1959) noted that the achievement motive in the retarded child is inferior to that of the normal child. Motivational level must be compensated for if learning is to be accomplished. Horticulture has strong motivational qualities as a training medium for the mentally retarded (Blackstock, undated; Relf, 1982). Also, horticulture provides a variety of stimuli to the retarded person. "Horticulture has more to interest the handicapped because it is not a routine, mechanical activity, such as stamping out parts of a product or similar function performed in sheltered workshops" (Durbin, 1973).

Along with this new interest in horticultural training comes the need for developing effective training methods. Task analysis is the general approach used in training disabled individuals in specific skills. Gold (1976) has documented the capabilities of moderately and severely retarded individuals to learn and to produce on complex tasks by using task analysis. Task analysis has been tested and proven to be effective for specific skills (Hiott, 1975; Morris, 1979; Bellamy, 1976) but has been accepted in horticulture without consideration of other methods. Could modeling, with verbal instruction and repetition, be another approach for vocational instructors to try?

Delp (1974) recommended investigating the actual work processes since many jobs can be simplified to be workable at a lower level. Tate (1974) describes a successful training program which used demonstration and repetition as training techniques. The job was broken down into steps to be used in an assembly line manner. Individuals were trained for one skill in the assembly line by the supervisor first demonstrating the skill two or three times. The worker was then talked through the task several times. The program was so successful that other products were added and many more workers were hired.

Miller (1970) described a pilot program in which mentally and physically disabled students are learning basic skills of yard, garden and home maintenance. The instructors taught by demonstrating how a task is performed and working with the students until the task is learned. "For these students, repetition is very important" (Miller, p.54, 1970).

Litton (1978) stated that modeling is essential in learning most of the social and academic behaviors outlined in the mentally retarded curriculum. "It is particularly important to note that once imitative responses were established, they generalized to include imitations that had never been specifically reinforced or trained. In other words, the retarded subjects had learned to imitate" (Litton, p.78, 1978).

Another need created from the acceptance of horticulture as a training area in prevocational and vocational programs is evaluation. After the initial evaluation, Copus (1980) suggests the program

personnel should explore long-range expectations for the trained in light of his/her potential balanced with the training program's capability of fulfilling that potential. Pascalides (1978) stated that the greenhouse structure itself may be used as a pre-test environment for new clients. The client is guided through various horticultural tasks, evaluated and instructional objectives can be formulated.

This study (1) developed a prevocational Horticultural Evaluation Test to measure language identification skills and physical/mental abilities of trainable mentally retarded adults and (2) tested the effectiveness of modeling with verbal instruction and repetition as a training technique for trainable mentally retarded in a horticultural prevocational setting.

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METHOD

Subjects

Subjects were 28 trainable mentally retarded adults (13 men, 15 women). Based on the Wechsler Adult Intelligence Scale or the Stanford-Binet Intelligence Scale, client scores ranged from 28-73 with the mean score being 53.

Eight subjects (6 men, 2 women) attended the trainable mentally retarded class within a public middle school system. Their ages ranged from 16 to 19, with the average age being 18. All had been involved in a prevocational program for one year. None had received formal training in horticulture.

Twenty subjects (7 men, 13 women) were from a work training center with two to nine years involvement at the center. Their ages ranged from 21 to 67, with the average age being 36. Seven of the workers were in an existing prevocational horticultural training program at the center, the other thirteen had not received horticultural training. All subjects were expected to remain at the training center throughout their working career.

Horticultural Evaluation Test (H.E.T.)

In developing the Horticultural Evaluation Test, input was obtained from horticultural therapy staff, horticulture faculty and greenhouse growers to determine the basic skills required to work in a greenhouse. Information was collected on the basic horticultural materials and equipment that should be known by employees working within a greenhouse.

As shown in Table I, thirteen greenhouse supplies and tools and five horticultural plant parts were selected for the identification section of the H.E.T. Eight work skills were identified. The identification and work skill sections tested horticultural knowledge, language skills and physical/mental abilities.

The H.E.T. was administered in a video-tape format to insure minimal influence and prompting by the examiner.

The identification section was scored using the following Likert scale:

- 5 = correct response
- 4 = partial identification, wrong term
- 3 = some concept of the item was shown, but
wrong term
- 2 = no idea or wrong idea, but gave a response
- 1 = gave no response.

The work skills section of the H.E.T. was initially scored on a three point scale but was converted to the following Likert scale:

- 5 = pass, the task was completed satisfactory
- 4 = partial completion of the task
- 3 = attempt, the task was attempted and an understanding of the instructions was shown
- 2 = inadequate attempt
- 1 = failure, no attempt was made

Two trained scorers were used to insure reliability. Of 1,512 scores taken, 29 varied between scorers by only one point.

Maximum points attainable using the Horticultural Evaluation Test was 135; 90 points for identification and 45 points for work skills. The Horticultural Evaluation Test is presented in Appendix A.

Experimental Design

Four groups were identified (one control group and three experimental groups):

The Control Group consisted of eight subjects from the work

TABLE I

TEST ITEMS RELATION TO CONCEPT CATEGORIES

CONCEPT	TEST ITEM
Horticultural Containers	Flat Clay Pot Plastic Pot
Planting Media	Perlite Soil Peat Moss
Horticultural Tools	Watering Can Trowel Clippers Plastic Labels Hose Hose Nozzle Warning Sign
Plant Anatomy	Roots Stem Leaf Flower Seed
Horticultural Work Skills	Writing Counting Mixing Soil Filling a Pot Pressing Soil Taking a Cutting Sticking a Cutting Watering

center who had received no previous horticultural training nor any training during the experimental time period.

The Prevocational Horticulture Trainees were seven subjects from the work center who were in a greenhouse horticultural training program.

The Public School Horticulture Trainees were eight subjects from the middle grades with no previous horticultural training, who received two weeks of horticultural training.

The Workshop Horticulture Trainees were five subjects from the work center who had received no previous horticultural training, but received two weeks of horticultural training.

The subjects from the work center who had received no previous horticultural training were randomly assigned to the Control Group or the Adult Workshop Horticulture Trainee Group. The Prevocational Horticulture Trainee Group and the Public School Horticulture Trainee Group were previously assigned.

The Control Group and Prevocational Horticulture Trainee Group completed the Horticultural Evaluation Test twice during a three week period. The Prevocational Horticulture Trainee Group continued to receive horticultural training at the work center during this period. The two experimental groups received the pre-test, horticultural training, then the post-test.

Horticulture Training

Public School Horticulture Trainees were divided into two subgroups of four. The subgroups were formed based on the subjects availability to work with the trainer. Adult Workshop Horticulture Trainees were trained as one group of five.

Six horticultural training sessions were given; three a week for two consecutive weeks, 20 minutes per session. The first three sessions were directed toward horticultural item identification. The trainer would pick up each item and say "This is called a _____" and explain what it was and/or its use. Questions and discussion were encouraged. The trainer described all items at least twice within each 20 minute session.

The last three sessions reviewed horticultural identification items, then demonstrated modeling of work skill tasks. Each subject had in front of him/her all items needed to perform each task. The trainer would begin by explaining the task, why it is done in the greenhouse, and then demonstrate a process, such as filling a pot with planting media.

The trainer recorded the number of times each identification item and work skill task was repeated correctly or incorrectly using a Likert scale of one to five. Other observances were recorded such as absence and behavioral problems.

Evaluation

An item analysis, providing Discrimination Index, % Correct and Kuder-Richardson statistics, was conducted on the Horticultural Evaluation Test using pre-test and post-test scores. Means were computed for each item, concept category and group test scores. A Duncan's Multiple Range Test was conducted on pre-test and post-test scores for each item.

RESULTS

The Horticultural Evaluation Test had Kuder-Richardson values of 0.96 and 0.97 on the pre-test and post-test, respectively. As shown in Table II, the Discrimination Index values were above the minimum acceptable level of 0.20 for all five concept categories except for the horticulture tools concept on the pre-test. The Discrimination Index values were above 0.20 for all concept categories on the post-test. Of the 27 items on the test, 26 (96%) had a discrimination index above 0.20 for the post-test. The % of subjects who correctly responded to the language identification items was low in all concept categories except plant anatomy on both the pre- and post-test. A high % of subjects correctly completed the horticulture work skills. The % of subjects with the correct response on the H.E.T. increased two to four times from the pre- to post-test.

Language identification skills varied with the groups. As shown in Table IV, the subjects from the Public School Horticulture Trainee group were able to identify "flat", "peat moss", "plastic label", "hose nozzle", and "roots" significantly ($p < .05$) better than the control subjects. The Work Shop Horticulture Trainee subjects were able to identify "perlite", "peat moss", "hose nozzle", and "roots" significantly ($p < .05$) more correctly than the control subjects. The Prevocational Horticulture Trainee subjects identified "flat", "perlite", "peat moss", and "roots" significantly ($p < .05$) more frequently than the control subjects. With several items there was no significant difference between the groups, such as "clay pot", "plastic pot", "soil", "warning sign", "leaf", and "flower".

Horticulture work skill results were uniform across all subject groups. The level of achievement for the Public School Horticulture Trainee subjects was 4.3, the Workshop Horticulture Trainee subjects was 4.6, the Prevocational Horticulture Trainee subjects was 4.4, and the Control subjects was 3.8.

Achievement level significantly improved for the trained groups. Mean pre- and post-test H.E.T. scores for the four groups are shown in Table III. The increase in H.E.T. score from pre- to post-test for the Public School Horticulture Trainee group was highly significant ($p < .0001$). Also, significant increases in scores occurred from pre- to post-test for the Prevocational Horticulture Trainee group ($p < .006$) and the Workshop Horticulture Trainee group ($p < .07$). Control group performance did not change on pre- and post-test H.E.T. scores.

Overall level of performance for the trained groups and control groups on the post-test was 80% and 66% respectively.

The Public School Horticulture Trainee group consistently showed higher achievement throughout the study. Significant ($p < .05$) increases above other subject groups occurred on four items of the language identification section and one item on the work skills section, as shown in Table V. The Public School Horticulture Trainee group also had the most significant change from pre- to post-test scores.

The Control group consistently had the lowest scores on the pre- and post-test which was expected. Nontrained prevocational horticulture subjects had the highest score on the pre-test which was expected since

they had previous horticultural training.

"Modeling" as the training method, increased the % of subjects responding correctly to the H.E.T. items and increased the H.E.T. scores significantly.

DISCUSSION

The H.E.T. was developed to assess the horticultural skills of trainable mentally retarded adults. The reliability and types of questions contained on the H.E.T. were found to accurately measure subjects horticulture knowledge and skills.

The video-tape format for giving the test was effective. The subjects were very attentive to the television, giving little attention to the scorers. The consistent Discrimination Index values, above the accepted minimum, may be related to the use of video-tape in testing.

Several of the subjects have low verbal skills which was shown by the low % of subjects who got the language identification items correct on the Horticultural Containers, Planting Media, and Horticultural Tools concepts. Also, with many of the items in these concept categories, the subjects showed they knew how to use the item but did not know the specific term chosen for this test. For example, several identified "soil" as "dirt", "trowel" as "spade" and "warning sign" as "danger".

Trainable mentally retarded subjects are aware of plants within their environment. Subjects scored highest on Plant Anatomy concept categories. Plant parts; i.e., leaves, stems, etc. are universally

understood and part of the horticultural language of trainable mentally retarded.

The six items on which the groups varied were novel items, not commonly seen. For instance, with plant anatomy items, most subjects were familiar with "leaf", "flower", and "seed" but responses varied greatly for "roots", the part of the plant not seen. These items also had the largest change from pre- to post-test for the experimental groups which support the novelty concept.

Communication may be a problem for mentally retarded. However, through modeling it was clear that they can understand and follow instructions. A high % of the subjects scored well on the work skill items showing that the instructions were understood and could be physically completed.

Modeling, as a horticultural training method, is successful for trainable mentally retarded adults. The two experimental groups receiving the modeling had significant increases in scores from pre- to post-test. The Prevocational Horticulture Trainee group had significant increases in test scores, but not as great of changes occurred as did for the Public School Horticulture Trainee group and the Workshop Horticulture Trainee group.

The Public School Horticulture Trainee group consistently did better throughout the study. Within the three weeks between pre- and post-testing, younger subjects retained more than older subjects. Introducing horticulture early in a trainable mentally retarded subject's life such as in the prevocational program within a school system is recommended.

Before mentally retarded subjects can be placed in horticultural

positions other aspects of their work performance need evaluation. These would include work readiness skills, social skills, and psychological makeup. Further investigation is needed on the training method to determine time needed to learn each task and subsequent retention levels.

TABLE II

MEAN NUMBER OF DISCRIMINATION INDEX AND % CORRECT BY CONCEPT FOR THE
HORTICULTURAL EVALUATION TEST

<u>CONCEPT</u>	<u>DISCRIMINATION INDEX</u>		<u>% OF SUBJECTS WITH CORRECT RESPONSE</u>	
	<u>PRE-TEST</u>	<u>POST-TEST</u>	<u>PRE-TEST</u>	<u>POST-TEST</u>
<u>Language Concepts</u>				
Horticulture Plant Containers	+0.21	+0.41	7.2	26.2
Planting Media	+0.58	+0.62	19.1	38.1
Horticulture Tools	+0.12	+0.62	18.4	37.3
Plant Anatomy	+0.52	+0.52	40.9	69.3
<u>Work Skills</u>				
Horticulture Work Skills	+0.55	+0.58	54.8	68.3

TABLE III

MEAN SCORES AND CHANGE IN SCORES ON THE HORTICULTURAL EVALUATION TEST
FOR ALL RESEARCH GROUPS

GROUP	PRE-	POST-	CHANGE	T VALUE	p<.05
Public School Horticulture Trainees	87.6	110.4	22.8	10.61	0.0001
Workshop Horticulture Trainees	99.6	111.6	12.0	2.42	0.0724
Control Group	92.9	91.4	-1.5	-0.68	0.5180
Prevocational Horticulture Trainees	104.4	109.7	5.3	4.11	0.0063

Note. Maximum score = 135.

TABLE IV

POST-TEST SCORES ON SPECIFIC ITEMS FROM THE HORTICULTURAL EVALUATION TEST

ITEM	TRAINED (WITH MODELING)		NON-TRAINED	PRE-TRAINED
	Public School	Workshop	Control	Prevocational
Flat	4.3a ^z	2.6b	2.2c	4.1a
Clay Pot	4.1a	3.2a	3.4a	3.9a
Plastic Pot	3.0a	3.8a	2.9a	3.7a
Perlite	3.4b	4.2a	2.3b	3.9a
Soil	3.8a	3.6a	3.9a	4.1a
Peat Moss	4.0a	4.4a	2.3b	3.9a
Plastic Labels	4.3a	3.4b	2.1b	3.1b
Hose Nozzle	4.0a	4.2a	2.4b	3.0b
Warning Sign	3.6a	3.6a	3.0a	2.7a
Roots	3.1a	3.8a	2.6b	4.6a
Leaf	5.0a	4.2a	4.0a	4.6a
Flower	5.0a	4.2a	4.3a	4.6a

^zMeans in the same row with the same letter are not significantly different from one another ($p < .05$, D.M.R.T.).

Note. Maximum score for each item = 5.0.

TABLE V

MEAN CHANGES OF SPECIFIC ITEMS FROM THE HORTICULTURAL EVALUATION TEST

ITEM	TRAINED (WITH MODELING)		NON-TRAINED	PRE-TRAINED
	Public School	Workshop	Control	Prevocational
Flat	2.0a ^z	-0.4b	0.0b	0.4b
Clay Pot	1.4a	0.0b	0.0b	0.0b
Plastic Label	2.3a	0.4b	-0.3b	0.3b
Hose Nozzle	1.9a	1.2b	0.3b	0.0b
Taking a Cutting	1.5a	0.0b	-0.1b	0.0b

^zMeans in the same row with the same letter are not significantly different from one another ($p < .05$, D.M.R.T.).

APPENDIX A

HORTICULTURAL EVALUATION INSTRUMENT

PART ONE: IDENTIFYING GREENHOUSE SUPPLIES AND PLANT PARTS

The following are the items to be identified:

Flat
Clay pot
Plastic pot
Perlite
Soil
Peat moss
Watering can
Trowel
Clippers
Plastic Labels
Hose
Hose Nozzle
Warning Sign
Roots
Stem
Leaves
Flower
Seeds

Each item will be shown on the television screen for ten seconds and also placed in front of the subject. The tape will go into the pause mode until the subject responds to the question "What is this called?". The item will then be removed, the next item will appear on the screen and be placed in front of him/her. This is repeated for all items listed above.

PART TWO: WORK SKILL TASKS

All items for each task will be placed in front of the subject before viewing it on the television. The items are pointed to and identified on the tape as the audio is proceeding. After the instructions are completed the tape will go into the pause mode while the subject does the task. Each task will be played up to three times if the subject so requests.

Following is a list of all work skill tasks to be tested, the materials needed for each task and the audio for each task.

Task 1: Writing

Materials: label, pencil, printed label or something to copy

Audio: In front of you is a pencil and label. Use the pencil to copy this word on the label.

Task 2: Counting

Materials: a stack of pots (more than 10)

Audio: In front of you is a stack of pots. Count out 10 pots from the stack.

Task 3: Mixing Soil

Materials: equal amounts of soil, perlite and peat moss in separate piles

Audio: There are 3 piles in front of you. Mix the 3 piles together.

Task 4: Filling a Pot

Materials: planting media and a pot

Audio: In front of you is a pot and planting media. Fill the pot full with planting media.

Task 5: Pressing Soil

Materials: dibble stick(tool), pot filled with planting media

Audio: (Visual will be modeling this task). This part of the tool must go in the center of the pot then press the tool down.

Task 6: Taking a Cutting

Materials: clippers, vine that is marked

Audio: In front of you are clippers. Use the clippers to cut the plant on the mark.

Task 7: Sticking a Cutting

Materials: a cutting, a pot with a hole poked in the planting media

Audio: In front of you is a cutting and a filled pot. Point to the bottom of the cutting.

Place the bottom end of the cutting in the hole in the filled pot.

Task 8: Watering(2 steps)

Materials: water in a watering can, measuring cup with different color lines as measurement marks, potted plant

Audio: Step 1 - In front of you is a watering can, measuring cup and plant. There is water in here. Pour water to the red line in the measuring cup.

Step 2 - Pour the water from the measuring cup in to the pot.

IDENTIFYING GREENHOUSE SUPPLIES

IDENTIFYING GREENHOUSE SUPPLIES	TIME	TALLY/RESPONSE
FLAT		
CLAY POT		
PLASTIC POT		
PERLITE		
SOIL		
PEAT MOSS		
WATERING CAN		
TROWEL		
CLIPPERS		
PLASTIC LABELS		
HOSE		
HOSE NOZZLE		
WARNING SIGN		
TOTAL - GREENHOUSE SUPPLIES		
IDENTIFYING PLANT PARTS		
ROOTS		
STEM		
LEAF		
FLOWER		
SEED		
FRUIT		
TOTAL - PLANT PARTS		
TOTAL - BOTH		
	IDENTIFICATION SCORE SHEET	RATING SCALE

DATE _____

EVALUATOR _____

SUBJECT _____

CORRECT = TALLY MARK ✕

INCORRECT = NO TALLY MARK/
RECORD RESPONSE

TASK	TIME	SCORE	COMMENTS
WRITING			
COUNTING			
MIXING SOIL			
FILLING A POT			
PRESSING SOIL			
TAKING A CUTTING			
STICKING A CUTTING			
WATERING			
STEP 1			
STEP 2			
TOTAL SCORES			

RATING SCALE

PASS = 3

ATTEMPT = 2

FAIL = 1

TASK SCORE SHEET

DATE

EVALUATOR

SUBJECT

APPENDIX B

INFORMED CONSENT FORM

PROCEDURES TO BE USED FOR PROTECTION OF HUMAN RIGHTS:

Informed Consent Statement:

This study is being conducted under guidelines established by Kansas State University. This study will determine through pre- and post-testing the effectiveness of modeling as a training technique for a prevocational horticulture training program. By cooperating, your child will help provide answers to important questions; however, your child's participation is strictly voluntary and may withdraw from the study at anytime. A horticultural evaluation form will be used for the pre- and post- tests. Your child will be involved in basic horticulture activities, such as, identification of greenhouse supplies and plant parts, mixing soil, filling pots, taking cuttings, and watering. All activities conducted and tools used will be supervised with no immediate risk involved to your child. Information collected in pre- and post- testing and observations will be kept strictly confidential. Confidentiality is guaranteed; your child's name will not be associated in any public or private report of the results. You may withdraw consent and discontinue participation for your child in the study at any time.

Consent Statement:

I, the parent of the subject, have read the above statement and have been fully advised of the procedures to be used on my child in this project. I understand the potential risks involved in the project and I hereby assume them voluntarily for my child.

Subjects Name	Age	Guardian or Parent Signature	Date
_____	_____	_____	_____

If you have any questions or concerns about this project please call Candice Shoemaker at 532-5944 or Dr. Mattson at 532-6170. We will be happy to explain further and appreciate your help in this study.

APPENDIX C

PRE-TEST AND POST-TEST MEAN SCORES FOR CONCEPT CATEGORIES

PRE-TEST MEAN SCORES FOR CONCEPT CATEGORIES

<u>CONCEPT</u>	<u>GROUP</u>			
	PUBLIC SCHOOL	WORKSHOP	CONTROL	PREVOCATIONAL
Horticulture				
Plant Containers	2.5	3.1	2.9	3.7
Planting Media	3.0	3.6	3.0	3.9
Horticulture Tools	3.3	3.4	3.4	3.5
Plant Anatomy	3.5	4.0	3.7	4.1
Horticulture				
Work Skills	3.5	4.0	3.8	4.1
Total	15.8	18.1	16.8	19.3

Note. Maximum score for each concept = 5.0.

POST-TEST MEAN SCORES FOR CONCEPT CATEGORIES

<u>CONCEPT</u>	<u>GROUP</u>			
	PUBLIC SCHOOL	WORKSHOP	CONTROL	PREVOCATIONAL
Horticulture				
Plant Containers	3.8	3.2	2.9	3.9
Planting Media	3.7	4.1	2.8	4.0
Horticulture Tools	4.2	4.0	3.1	3.6
Plant Anatomy	4.1	4.1	3.8	4.3
Horticulture				
Work Skills	4.3	4.6	3.8	4.4
Total	20.1	20.0	16.4	20.2

Note. Maximum score for each concept = 5.0.

APPENDIX D
PRE-TEST AND POST-TEST % CORRECT FOR EACH ITEM OF THE HORTICULTURAL
EVALUATION TEST

PRE-TEST AND POST-TEST % CORRECT FROM EACH ITEM OF THE HORTICULTURAL
EVALUATION TEST

ITEM	PUBLIC SCHOOL		WORKSHOP		PREVOCATIONAL		CONTROL	
	PRE-	POST-	PRE-	POST-	PRE-	POST-	PRE-	POST-
1. Flat	0.0	75.0	20.0	20.0	57.1	71.4	0.0	0.0
2. Clay Pot	0.0	62.5	0.0	20.0	14.3	14.3	0.0	0.0
3. Plastic Pot	0.0	12.5	0.0	40.0	0.0	0.0	0.0	0.0
4. Perlite	0.0	37.5	40.0	80.0	57.1	57.1	0.0	0.0
5. Soil	0.0	25.0	40.0	60.0	42.9	42.9	0.0	0.0
6. Peat Moss	0.0	62.5	20.0	80.0	57.1	57.1	0.0	0.0
7. Watering								
Can	0.0	87.5	0.0	60.0	42.9	71.4	12.5	12.5
8. Trowel	0.0	12.5	0.0	60.0	0.0	0.0	0.0	0.0
9. Clippers	25.0	37.5	0.0	60.0	42.9	28.6	25.0	25.0
10. Plastic								
Label	0.0	62.5	0.0	60.0	0.0	14.3	0.0	0.0
11. Hose	87.5	100.0	80.0	80.0	85.7	85.7	87.5	75.0
12. Hose Nozzle	0.0	62.5	0.0	60.0	14.3	0.0	0.0	0.0
13. Warning								
Sign	0.0	12.5	0.0	40.0	0.0	0.0	0.0	0.0
14. Roots	0.0	37.5	40.0	60.0	85.7	85.7	25.0	25.0
15. Stem	0.0	37.5	40.0	80.0	28.6	57.1	12.5	50.0
16. Leaf	87.5	100.0	80.0	80.0	71.4	85.7	62.5	62.5
17. Flower	62.5	100.0	80.0	80.0	71.5	85.7	87.5	75.0
18. Seed	75.0	75.0	80.0	80.0	85.7	71.4	75.0	75.0
19. Writing	0.0	75.0	60.0	100.0	28.6	57.1	37.5	37.5
20. Counting	50.0	62.5	60.0	80.0	71.4	71.4	37.5	37.5
21. Mixing Soil	37.5	62.5	40.0	80.0	57.1	71.4	25.0	50.0
22. Filling								
A Pot	62.5	62.5	80.0	80.0	57.1	28.6	62.5	50.0
23. Pressing								
Soil	37.5	62.5	80.0	100.0	71.4	100.0	62.5	50.0
24. Taking a								
Cutting	37.5	87.5	80.0	80.0	71.4	71.4	62.5	62.5
25. Sticking a								
Cutting	75.0	75.0	80.0	100.0	85.7	100.0	87.5	62.5
26. Step 1								
Watering	25.0	50.0	60.0	80.0	42.9	57.1	37.5	37.5
27. Step 2								
Watering	62.5	87.5	60.0	100.0	57.1	100.0	64.3	87.5

MODELING AS A
PREVOCATIONAL HORTICULTURAL TRAINING METHOD
WITH TRAINABLE MENTALLY RETARDED ADULTS

by

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B.S. - Michigan State University, 1978

AN ABSTRACT OF A MASTER'S THESIS

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Horticulture is gaining recognition as a realistic vocation for the mentally retarded. A video tape Horticultural Evaluation Test (H.E.T.) was developed to evaluate language identification and work skills of trainable mentally retarded adults. Modeling, with verbal instruction and repetition, as a prevocational horticultural training technique was tested for effectiveness with trainable mentally retarded.

Public school and workshop horticulture trainee groups received the horticultural "modeling" training. These two groups were compared with a group involved in an existing horticultural training program and a control group, which received no training. Each of the four groups completed the H.E.T. as pre- and post-tests, at three week intervals. "Modeling" training was completed with the experimental groups in two weeks.

Kuder-Richardson and Item Analysis conducted on the H.E.T. indicated that test questions were consistently answered and understood by subjects. Less than 40% of the subjects had the correct response on the language identification items after training, showing a language deficit. Over 68% of the subjects correctly completed the work skills items after training, indicating the ability to follow instructions for a physical horticultural task.

Means were compared for each item, concept category and group test score. The trained subject scores increased, on the average, on 12 of 18 language identification items and 7 of 9 work skill items. The three groups receiving horticulture training had significant increases in post-test scores with the two groups receiving

the "modeling" training having the greatest increases. Modeling can be an effective training method in a prevocational training program for trainable mentally retarded.