CHAPTER II
REVIEW OF LITERATURE

The purpose of this chapter is to review the literature related to the use of different learning strategies in the acquisition of vocational skills by individuals with severe mental retardation and how these link with the retention/termination of jobs in competitive employment.

Learning Strategies

Researchers have focussed on the identification of various learning strategies, such as learning through the visual mode, through the auditory mode and/or combined visual and auditory modes and the self-monitoring procedures in the acquisition of vocational skills by individuals who are mentally retarded. The efficacy of these methods in the acquisition of skills is found varied. Also, the skill acquisition was known to be facilitated in a number of ways, such as -

(a) By the Organization of Input Stimuli

Jensen (1965) investigated the acquisition of serial and paired associate learning tasks, using pairs of pictures of common objects, by 40 non-retarded children and 40 adults having mental retardation. He found that the paired associate learning in both groups was facilitated largely by mediated instruction in which the pictures of objects were used for
instruction. Eight pairs of coloured pictures of common objects were used in this experiment to teach simple sentences. It was found that the subjects with mental retardation who were provided with the mediating context in the form of pictures performed significantly better on the very first trial, than a matched group of subjects with retardation who were not provided with the mediating context. Additionally the errors made by subjects, given the mediators, were only slightly fewer than that of the matched mental age non-retarded subjects who were not given mediated instruction. These findings indicated that the mentally retarded individuals required the provision of the organized mediated instruction for an optimal learning to occur.

In another study, Spitz (1966) tried to identify the appropriate methods to optimize learning through "input organization" of materials presented to individuals with mental retardation. He maintained that since individuals with mental retardation were deficient in their ability to conceptualize, store, and retrieve materials, the materials presented to these individuals needed to be well organized for an optimal learning to occur. In fact the experimenter or the teacher must by one's own ingenuity devise ways of presenting the materials in an efficiently organized manner in order to maximize the learning potential of individuals with mental retardation. He further added that the lower the I.Q. of
individuals with mental retardation, the more meaningful must be the material for these individuals to enable them to perform at the level of equal mental age non retarded individuals.

(b) The Use of Image in Recall and Recognition

The role of imagery in paired associate learning of children was investigated by Reese (1970). He maintained that paired associate learning was easily accomplished when the stimulus and response items were meaningful words rather than nonsense syllables and that the image presentation of meaningful words facilitated learning and performance. Reese cited the early research by Kohler (1929, pp 287-288), who theorized that it was easier to form visual images of meaningful paired associate words than of the nonsense material and "the visual image organizes the material in the Gestaltist sense of 'organization' and organized material is easier to remember" (p.404).

The role of image in recall and recognition supported the research findings that the pictures provided more effective stimuli than words. Paivio (1976) investigated the effect of imagery on the performance of recall and recognition memory tasks. The process of dual coding under imaginal and verbal coding conditions accounted for the difference in performance on tasks. Further, that "...the probability of dual coding is highest in the case of pictures of familiar objects, they
are likely to be labeled by the subject, next highest in the case of concrete nouns, many subjects will imagine the objects suggested by the nouns and lowest in the case of abstract nouns, subjects are least likely to image such words because they lack direct linkages with corresponding non-verbal representations" (Paivio, 1976: 109). It thus appeared that the extent of facilitation through imagery will depend on the nature of the material.

(c) Modality Learning

Studies conducted on the modes of learning among individuals with mental retardation indicated the possibility of their acquisition of skills through the visual mode (Evans, 1970), the auditory mode (Gerjuoy and Winters, 1970) and through a combined visual-auditory mode (McConkey and Green, 1973). However, there were very few studies that examined the comparative effectiveness of the visual, auditory or a combined visual-auditory mode in facilitating learning among individuals with mental retardation.

Bruininks and Clark (1972) examined the effects of pictures and words on learning among first grade children, both the mentally retarded and non retarded. Thirty-six first grade children between the ages of 6 years and 3 months and 7 years and 3 months were divided into 3 groups. The first group consisted of the disadvantaged children, who were retarded with IQs between 60 and 80. The second group consisted of
disadvantaged non-retarded children with IQs between 90 and 112, and the third group was of the advantaged non-retarded children with IQs between 90 and 112. The children were tested individually on three different paired-associate (paired nouns to minimize ease of association, hence maximizing their conceptual dissimilarity, e.g., book-cat rather than dog-cat) tasks consisting of concrete nouns. Each child received a visual presentation, an auditory presentation and a combined visual-auditory presentation. The results of this study indicated that all children responded better to visual cues than to auditory cues. Children who were retarded recalled twice as many words when presented pictorially than when presented auditorily, and their response to a combined visual-auditory presentation was also higher than to an only auditory presentation. The authors maintained that the performance of all three groups under "...visual and a combined auditory-visual modes of presentation was significantly higher" than achieved under an only auditory presentation, and added that these findings were contrary to the findings of earlier studies (Budoff and Quinlan, 1964; Carterette and Jones, 1967; Shapiro, 1966). While the earlier studies reported higher learning performance of young children under auditory presentation and better learning for older children and adults with visual presentations, the findings of this study showed that young children learned more efficiently when pictures were
employed as visual stimulus material, than the words used under auditory stimulus condition.

In another study, McConkey and Green (1973) investigated the free recall performance of twenty-four adults having mental retardation. Subjects were matched on vocabulary-age as measured by the English picture vocabulary test, chronological age, and Basic Recall Ability scores. (The B R A score consisted of the number of items correctly recalled, namely 16 unrelated items within 80 seconds after one 80 seconds visual-simultaneous presentation was made). The authors used three presentation methods: Auditory, visual-sequential and visual-simultaneous. Under visual-sequential presentation the items were presented at the rate of one item every five seconds. Under visual-simultaneous presentation all items were shown for eighty seconds. The items were chosen from four categories (fruit, clothing, animals and containers). For visual presentation, the slides of the items were made and projected, and for the auditory presentation the items were tape recorded. Subjects were divided into three groups. One group received auditory-sequential presentation, the second group received visual-sequential presentation and the third group received visual-simultaneous presentation. The results indicated that the two groups, who were given visual presentations, recalled significantly more items than the group who were given auditory presentation. The authors
concluded that "...retarded subjects recall more with visual presentation than with auditory presentation" (P.97).

(d) The Use of Picture Prompts

Some studies used the picture cues as an effective learning strategy to enhance the acquisition of vocational and complex survival skills of individuals with mental retardation. These studies indicated the possibility of acquisition of such skills through a systematic training package, and also the maintenance and generalization of these to other skill areas.

Robinson-Wilson (1977) reported a study of three adults with severe retardation who were taught to prepare simple food items. The items selected for training were hot-dogs, jello and hot-chocolate. The recipe system was designed in a manner that allowed independent cooking with minimal pre-requisite skills, such as number recognition skills or a sight-word vocabulary. Pictures were used to illustrate all cooking steps, to discriminate the measurements and temperatures by colour coding, to show measurement instruments, and temperature controls. It used a standardized set of symbols so that after training the individuals could prepare a novel food item with the recipe without any assistance. The picture recipes consisted of pictures drawn on 5 X 8 inch cards, which were joined together by two rings at the top. The first card was a large colour picture of the finished product. Below the
picture was the name of the food item. The next card had a picture list of the food ingredients and the cooking and eating equipment that were to be set out. The following cards contained the recipe, and the three steps per card. Each step was separated by drawing a line. All the food products were shown in their natural colours. The cards were plastic coated and had a wood-stand that held them in an upright position. The dials of the burners were colour coded with a piece of tape of a specific shape to indicate the burner of the cooking range it regulated. Training consisted primarily of teaching the recognition of symbols for food items, the necessary equipment and manipulations. The trainees were taught how to "read" the recipe cards.

All three trainees learned to match the pictures with the items that had to be prepared and the colour codes and symbols with the equipment they represented. The trainees prepared all the three recipes using the pictures and symbols on the cards package. Data indicated a gradual increase in the percent of correct steps across trials for each recipe for the three trainees, with the initial recipe requiring more trials and more time in each case, before the criterion performance was achieved. This indicated the possibility of the utility of the picture recipe system and the possibility of a generalization of the skill to other recipes. The results of the study demonstrated that picture cue training can be effective in
teaching individuals with severe mental retardation skills and help acquire independence, necessary for the adjustment and optimal participation in one's living environment.

Sowers, Rusch, Connis and Cummings (1980) used picture cues to teach adults with mental retardation to "time-manage" themselves during lunch and break hours in a vocational setting. Three adults who had a minimal ability to tell time were trained to go to lunch and return from lunch, to go to break and return from break at the specified time. An index card having four clock face representations and the hands of the clock drawn on it was used to indicate each trainee's assigned lunch and break times. Pre-instructions were given in the form of how to perform each of the required behaviours when the "real" clock matched the faces of the clock that were drawn on the index card. Instructional feedback was given in the form of praise following correct responses, and reprimands, and repeat instruction following incorrect responses. Pre and post test measures were used in the study to determine the effectiveness of the picture cue training package in teaching the time management skills. The results of this study indicated that individuals with mental retardation, when provided with visual cues, instructions and feedback on the use of visual cues, could be trained to perform the required behaviours at the assigned times. Thus picture cue training package was found effective in the
acquisition of a survival skill that was useful in the community and in competitive employment settings.

Martin, Rusch, James, Decker and Trtol (1982) examined the effects of picture cues in the training for the completion of complex meal tasks given to three adults having mild and moderate mental retardation. The subjects were employed as kitchen labourers in the food service division of a university campus and lived in community apartments. The training was conducted in the kitchens of the apartments of the subjects. Five nutritionally balanced meals were selected for (preparation) training. Each meal was task analyzed resulting in lists of steps that ranged from 48 to 76 steps or sub tasks depending upon the complexity of the meal. The meals selected required the use of most of the basic cooking skills (i.e., frying, baking, broiling, defrosting, peeling, measuring and slicing). Two experimental phases were used: (a) pre-instruction and instructional feedback, and (b) pre-instruction, instructional-feedback and picture recipe cards.

During the first phase the trainer instructed the subject in the sequential completion of each step of the task, reviewed all steps and then told the subject to prepare the meal. Instructional feedback was given in the form of verbal praise or error correction. In phase two, the photographs of each step for the five meals, except for the stove controls which were hand drawn, were placed on laminated cards. Below
each picture was a number that indicated the card's position in the sequenced recipe and a typed statement that described the step. Pre-instruction was provided in the use of the recipe cards immediately before the preparation of the meal, and continued until all steps were reviewed. Then the subject was told to prepare the meal. Instructional feedback was given in the form of directing the subject to the correct use of the picture recipe cards, through verbal and/or physical cues when a page was not turned or was turned out of sequence.

The results of the study revealed several things. First, adults having mild and moderate mental retardation can learn to prepare complex meals through a systematic training programme using sequenced picture cues. Secondly pre-instruction and instructional feedback combined with pictorial cues helped each subject complete more steps independently across the five meals. Third, a comparison of the results of baseline procedures and the procedures including the picture cues, clearly indicated the positive effects of picture cues on the acquisition of complex tasks. Fourth, as the task required utilizing all the basic cooking skills through a number of complex steps in a sequential order using picture cues, it facilitated the training of the individuals in all areas of meal preparation. Fifth, the operation of the sequenced picture cues as the mediating variables enabled the individuals to control their performance within a chain of
complex behaviours. Finally, and most importantly this training package resulted in the acquisition of a complex survival skill which was paramount for their independent functioning. If adults having mental retardation had to live and function in the community, they needed to have the mastery of such skills for independent functioning.

The effects of picture prompts on the acquisition, generalization and maintenance of complex vocational tasks were investigated by Wacker and Berg (1983). The participants in this study were five high school students with moderate and severe mental retardation. Four tasks were chosen: two training tasks (a black valve assembly and a circuit board assembly) and two generalization tasks (a double red valve assembly and a packaging task). These tasks were chosen for the following reasons.

1. They were routinely used by the staff to teach the students various types of assembly operations.

2. The method used by staff in setting up the tasks daily involved considerable staff time; the parts had to be sequentially organized into separate containers.

3. The double valve assembly and packaging task was usually conducted in a group because these two tasks were considered too complex for a single student to perform.

The study used picture prompts to determine if:
1. The need for sequentially organizing the parts by the staff could be eliminated and,
2. If the picture prompts could help in the completion of complex tasks by a single student independently.

The picture prompts consisted of pictures for each task bound into separate books. The pictures were organized sequentially indicating the steps to be completed (e.g., the part to be selected by the student, how to fit the selected part with another part) until all steps in the sequence were completed. The results indicated that the picture prompts were an effective method to train the students in the assembly of complex objects. The sequencing of pictures for steps of each task eliminated the need of the staff to perform the time consuming job of setting up individual tasks. The setting of pictures in a sequential order depicting the parts and the steps to be followed, enabled the students to perform the entire task independently. After training, all students performed without error, both with and without picture prompts. Four out of the five students maintained their performance with 100 percent accuracy on one of the tasks over a period of two to four weeks. Results of training generalized to the two generalization tasks for three students. When picture prompts were removed all three students (60 percent) demonstrated substantial decreases in performance on the generalization tasks, but increased their accuracy of
performance when picture prompts were again reintroduced. A very brief training was required on one of the generalization tasks when picture prompts were provided to guide the performance, but it resulted in errorless performance.

The results of the investigation indicated that the picture prompts were effective in training individuals with severe mental retardation. It was economical as it saved instructors' time by eliminating the laborious processes. It promoted generalization to novel tasks. It promoted the maintenance of performance across time. Finally, in some cases the picture prompts could also be used as permanent prompts to guide the performance, when other training stimuli were removed.

Sowers, Verdy, Bourbeau and Sheehan (1985) investigated the effectiveness of picture cues and the self monitoring in a vocational setting programme for four high school students having moderate to severe mental retardation. The primary goal of the study was to investigate the extent to which the picture cue training package enhanced the work flexibility of these individuals. In contrast to the earlier studies where researchers used the same tasks and the task sequence throughout the study, in this study tasks and the order of presentation of these tasks were varied daily. The training package consisted of the photographs of vocational tasks (e.g., wash soup pots, bring in garbage cans, clean refrigerat-
tor) fixed in a pre-determined order (which varied daily) on a photo album sheet. The sheet was fixed on a clip board. A water-based pen was provided to check off the photograph after the completion of the corresponding task. The picture cue apparatus was kept in a convenient place, where the students could easily access it. Students were assigned seven tasks out of a total of thirteen tasks each day. Self-monitoring training consisted of teaching the students (1) how to match the pictures with the tasks, (2) how to complete the corresponding task, and (3) how to mark off each picture corresponding to that task.

Three training phases (A, B, and C) were used to teach the students how to use the picture cue system. During phase A, the trainer presented each of the 13 pictures to the student, named the task, and escorted him to the task. Correct responding was achieved through the provision of modelling, corrective feedback and praise for each step. Phase A ended with the student being given the picture-cue apparatus with 7 pictures inserted, and being prompted through the steps for each task during the work day. Phase B procedures were the same as in phase A, except that the students were not prompted through each step. During phase C, students were given the pictures and reminded to do each of the steps. Praise was given only after the successful completion of all the steps.
Corrective feedback was provided if an error was made on any step.

The results of this study indicated that the students learned quickly to perform the different tasks with the picture cues and were able to self-monitor their performance. In the maintenance phase, when no instructions or reminders were provided, students completed the tasks with the picture cues and monitored their performance. The effect of generalization was seen when novel pictures were presented and these students were able to perform the tasks corresponding to the novel pictures. The authors concluded that the training of individuals with mental retardation through such a self control package was a practical, efficient and effective method, and thus it should be useful for competitive employment settings.

The vocational prospects of mentally retarded individuals in India in the context of employment opportunities have been examined by some researchers. Kutty (1988) looked at the nature, classification and potential of mentally retarded persons. The author dealt with the characteristics, and potential of the mentally retarded adolescents and adults in terms of employment opportunities. Cornelius (1989) examined the possibility of restructuring of the work environment for the mentally retarded persons. Kurani (1990), in a Pre-vocational training programme for mentally handicaped
emphasised the need to develop optimum personality potential and functions of the mentally retarded individual through treatment and training. Dhamani (1990) found the Vocational training and job placement of mentally handicapped persons providing a comprehensive developmental process involving multidisciplinary approach towards vocational training and job placement. Hariprasad (1991), in his review of the Vocational training and rehabilitation for the mentally handicapped, highlighted the need for a well conceived vocational training programme towards achieving the major goal of rehabilitation of mentally retarded individuals. Cornelius (1991), talked of further approaches to the vocational training of the mentally retarded persons. Ghai and Sen (1991), in regard to the Vocational training prospects for the mentally handicapped discussed the issue of the employment of individuals with mental retardation in the context of problems of unemployment of normal workers in a developing country like India.

While all the above topics are of immense importance in the vocational training curriculum, what needs to be addressed as a priority item is the issue of 'what' facilitates learning of the vocational skill for these individuals, and 'how' to structure the task so that it facilitates learning of the skill for these individuals. In other words, two predominant aspects of learning the 'what' and 'how' are to be determined
before any training programme can be envisaged to train the mentally retarded individuals. This essentially forms the rationale of the present study. Individuals with severe and profound retardation need powerful and systematic instructional techniques. These may include specific learning strategies in the form of visual, auditory and combined visual and auditory modes. The successful use of these specific learning strategies may improve the ability of individuals with severe and profound mental retardation in the acquisition of skills needed to function more independently in their home, employment settings, the community etc.

**Competitive Employment**

The adults with developmental disabilities should be provided appropriate community-based services and the requisite job opportunities, as this would enhance their chances of acquiring economic self-sufficiency, and more importantly the right to live as normal a life as possible. The integrated employment alternatives (Elder, 1984), also termed as "supported employment", were intended to benefit individuals with severe disabilities, including those with the most severe handicaps previously denied access to the rehabilitation system" (Kregel and Wehman, 1989:294). Wehman (1988) remarked that the feature of ongoing support made supported employment different from other rehabilitation services. Szymanski, Hanley-Maxwell, and Parker (1990) called
it "support provided to enable the individual to maintain effective functioning in the work-related ecosystem."

Supported employment was a flexible service option to fit the diverse needs of the individual and the community (Bellamy, Rhodes, Mank, and Albin, 1988). However, it was used more by individuals with mild or moderate mental retardation, who had previously attended sheltered workshops or other adult day programmes.

Jobs in Competitive Employment: Provision and Retention

The inability of individuals with severe mental retardation made it difficult for them to retain employment for extended periods of time, or avoid the termination of employment. They failed frequently because of low work-speed or rate, quality of work, maladaptive behaviours, poor motivation for work, relations with peers or co-workers, relations with the supervisor, failure to follow instructions, inadequate grooming and bizarre or aggressive behaviours (Brickey, Browning, and Campbell, 1982; Foss and Peterson, 1981).

Greenspan and Schoultz (1981) analysed the reasons underlying the loss of jobs by 30 individuals with mild or moderate mental retardation. Data were collected through the examination of service records and personal interviews with case-workers, job placement staff, and former employers. The
reasons were found to be social and nonsocial. Social reasons derived from Greenspan's theoretical framework of social competence (Greenspan, 1981) included temperament (affective quality of the subject's behaviour in the work place), character (moral quality of the subject's behaviour in the work place), and social awareness (the subject's understanding of other people and work settings). Nonsocial reasons included production (quality and quantity), health, and economic layoff. Their results although not statistically significant, indicated that 17 of the 30 individuals lost their jobs primarily due to social reasons. Of these 17, 5 lost their jobs for temperamental problems, 3 for character related problems, and 9 for lack of social awareness.

Wehman and Hill (1981) examined the factors that contributed to successful competitive employment of individuals with moderate and severe handicaps. They suggested that the instructional strategies used must be sensitive to the needs of these individuals and that with appropriate instructional techniques and coordinated placement efforts the severely handicapped individuals may be able to enter the labour force. Wehman and Hill maintained that "As deinstitutionalization of moderately and severely handicapped individuals continues, it is apparent that competitive employment is a vocational option that must be considered more closely than it has been in the past. Increased wages and
benefits, the opportunity to work with non-handicapped coworkers, the opportunity for advancement, and the more normalizing attributes of a non-sheltered work environment are compelling arguments for competitive employment" (p.338).

Brickey, Campbell, and Browning (1985) probed the reasons of job retention of 53 employees who had progressed from sheltered workshop to competitive employment. They found that contrary to the frequently cited social and nonsocial reasons, most still employed persons had parents encouraging them to work competitively. Hanley-Maxwell, Rusch, Chadsey-Rusch and Renzaglia (1986) replicated the findings of Greenspan and Shoultz (1981) systematically. They examined fifty-eight job terminations via record inspection and interviews with the job placement specialist in a competitive employment training and placement project. Reasons for termination were classified, utilizing the Greenspan and Shoultz (1981) categories, into temperament character, social awareness, production, health, and economy, but the study yielded different results. Maxwell et al (1986) found that subjects lost their jobs most often for reasons of character and/or production than for social awareness reasons.

Stodden and Browder (1986) found the factors for the successful participation of individuals with mental retardation in competitive employment settings in the areas of
(a) training approach and methodology, (b) programme management, and (c) trainee characteristics.

Hill, Wehman, Hill, and Goodall (1986) investigated the causes of job termination of competitively employed persons with mental retardation over a period of six years. Of the 107 job terminations, 50 percent were employee-related (e.g., attitude problems and skill or behavioral deficits) and the other 50 percent were caused by environmental forces such as economic-recession, parental interference, and transportation etc.

Two experiments were conducted by Wacker, Fromm-Steege, Berg, and Flynn (1989) on long-term (at least six months) employment of 51 individuals with moderate mental retardation placed in 64 competitive employment positions. In experiment 1, three of the ten components of a competitive employment training package were identified to differentiate successful employees (employed for at least six months) from the unsuccessful employees. These three components were (a) client advocate, (b) collateral behaviour, and (c) follow-up plan. In experiment 2, four successful employees were further evaluated to determine whether the successful employment was related to the three components identified and included in the training package. Results indicated that any successful employment had all the three components.
Hughes and Rusch (1989) investigated the reasons of job retention by two employees with severe mental retardation. The two individuals unable to solve work-related problems independently were employed by a janitorial supply company. They were taught to use self-instruction in combination with multiple exemplar training to solve the work related problems. The first step of the self-instruction training sequence required that the appropriate task was modelled and described verbally by the trainer. In the second step the subject performed the task while the trainer instructed verbally. In step three the subject performed the task while verbally self-instructing. Results indicated that both employees learned to solve trained and untrained work-related problems. The use of the combined strategy resulted in the generalization of acquired skills to the problems that occurred throughout the workday to which employees could not respond independently. Long-term maintenance was revealed by the follow up data collected on a daily basis through observation and recording over a period of six months. Both employees continued to respond correctly to 4 or 5 trained and untrained problem situations.

Shafer, Banks, and Kregel (1991) analyzed the employment retention of 302 individuals with mental retardation placed in competitive employment. They found that the employees experienced regular movement in and out of the labour market.
and at any given time more than 30 percent of all employees remained either unemployed or were awaiting replacement. The authors did not find any significant relation between employees' level of mental retardation and their employment status.

Conclusion

Several studies comparing visual stimuli, the auditory stimuli and the combined visual and auditory stimuli to facilitate learning of individuals with mental retardation were examined. Researchers have found support for the findings that pictures provide more effective stimuli than words. Bruininks and Clark (1972) maintained that one possible explanation for higher learning performance in the visual and combined aural/visual conditions as compared to the only aural condition was that "pictures may induce greater visual imagery (mental pictures) which facilitate association of stimulus and response items" (p.565). This would imply that, if the material presented is high in "imagery" content, it may facilitate the association between what is presented and the response that should follow. Thus, imagery rather than the mode of stimulus presentation would cause superior learning when pictures are used as visual stimulus material.

Similarly, Martin et al (1982) indicated that picture cues serve as antecedent cues which individuals with mental retardation can manipulate to guide their performance. The
cues establish a look-then-do sequence that permits these individuals to have greater control on task behavior. The picture cues promote self-control since they limit the range of discriminative stimuli. Stimuli when logically sequenced also increased the likelihood of desired responses. Stable discriminative stimuli provided by the picture prompts also establish self-control which allows these individuals to guide their performance. Additionally, self-control through picture prompts on one task promotes generalization and maintenance to other tasks and settings (Wacker and Berg, 1983).

Madhavan, Menon, Kumar and Kalyan (1990), Narayan (1992), Rai
(1993) early intervention services, Dave (1990), Deshpande
and Mathur (1990), Dharitri and Murthy (1987), Girimaji
(1990), Kohli (1981), Kohli (1990), policy issues etc. Gupta
Ramalingaswamy (1981), Rohtagi (1981), the issue of learning
strategies has not been specifically addressed. This is the
issue addressed in this research to a limited extent.