CHAPTER III

METHODOLOGY
CHAPTER III
METHODOLOGY

Problem Statement

The effectiveness of the specific learning strategies used to facilitate the learning and acquisition of vocational skills among adults having severe mental retardation will be different.

Assumptions

1. It is a common belief that individuals who are mentally retarded can perform only the simplest of tasks. Research has increasingly indicated, to the contrary the possibility of employing mentally retarded workers for performing complex tasks (Ghai and Sen 1991). The tasks included putting together of a drill machine, bicycle brakes, the plunger pulling (Evans and Spredlin, 1966), box-folding (Loos and Tizard, 1955) and marble-dropping (Tramontana, 1972). It is assumed here that even the severely mentally retarded individuals may be successfully trained for performing a complex vocational task, such as the assembly of a ball point pen.

2. Attention has been considered a pre-requisite to memory. It has been described as the absorption of cues related to a particular object or objects via the visual stimulus, or the absorption of an idea or thought via the auditory stimulus.
The human mind, as a processor of information, was known to respond primarily to verbal, meaningful information in acoustic and visual forms (Norman, 1969). The studies conducted revealed that the learning process of the severely mentally retarded individual is impaired because of the limitation of one's attention. Zeaman and House in their exhaustive researches pointed out that "...the reasons for the learning deficit do not seem to be in the area of instrumental learning, but rather in that of attention" (Zeaman and House 1963:160). McGhee (1969) concurring with this view indicated that "Zeaman and House have carried out a number of studies on discriminative learning in subnormal subjects, which convince them that the basic deficit in the subnormal individual is an attentional one" (pp.151-52). Thus, it may be assumed that the severely mentally retarded individuals can learn if "focalization and concentration" are focussed in their training, since they suffer from basic deficit of attention. This can be done by presenting to them the information in visual and acoustic forms.

3. Mentally retarded persons are unable to retain and store information and this limits the extent of their learning. Spitz (1966) maintained that since individuals with mental retardation were deficient in their ability to conceptualize, they were also unable to store and retrieve materials. The materials presented to them needed to be well organized for
optimal learning to occur. He further added that the lower the I.Q. of individuals with mental retardation, the more meaningful must be the material, to enable them to perform at the level of equal mental age of non-retarded individuals. McGhee indicated "...In Britain the work of O'Connor and Hermelin (1963) and others have laid great stress on pure short term retention as an important feature in the subnormal learning" (McGhee 1969:150-151). It is assumed here that if the training material presented is well organized (in a sequential order, broken into several steps and vividly presented) it may maximize the potential for learning by individuals with mental retardation. Additionally, the organized materials may facilitate the retention and retrieval of steps involved in the tasks, that have been learnt.

4. Individuals having a low I.Q. and falling in the severe range of mental retardation will demonstrate a low level of skill acquisition and performance, as compared to the individuals having a relatively higher I.Q. but in the severe range of mental retardation. Research has indicated that the performance on an intelligence test which determined the I.Q. of an individual was not one's ability or potential for learning. "One of the most complex issues surrounding the use of I.Q. in mental retardation pertains to the distinction between performance on an intelligence test and general
competency" (Baroff 1986:13). This implied that the level of
skill acquisition and performance are not related to the level
of I.Q. at which the individual with mental retardation is
functioning. The focus should not be "on the initial level of
performance but rather on the degree to which that level can
be raised following training" (Baroff 1986:21). Thus, it is
assumed that one's level of I.Q. may not determine the
individual's competency on the job: rather the competency on
the job may be achieved through repeated trials and exercise.

5. Research indicated that intelligence tests can be used to
identify the relative strengths and weaknesses of individuals
with mental retardation. Some individuals showed relatively
more strength on non-verbal tasks: those that involve some
motion or manual response, but do not require the use of
verbal skills. Such individuals tend to succeed more on tasks
such as "copying geometric designs, drawing pictures from a
visual pattern or identifying the missing parts in pictures"
(Kochani and Keller, 1981). However, there were others who
responded relatively easily to auditory cues. Because of the
deficits in their attention and focalisation they could better
guide their behaviour when given clear and concrete
instructions. It is assumed here that all severely retarded
individuals may not respond equally well to different modes of
learning such as the visual mode, the auditory mode or the
combined visual and auditory modes. They may show differences in their response to different modes.

6. Cattell (1986), in his experiments with 'reaction time' employed various methods for measuring the time-intervals between stimulus and response. He looked at the differences between sensory and motor responses and between discriminative and associative reactions during the "objective measurement of the time relations of human performances". The observations of individual differences made by Cattell and other researchers in 'reaction-time' with regard to various stimuli and in speed seemed to hold true also for the severely retarded individuals who showed wide variations in the time taken to respond to a given stimulus. It is assumed that all severely retarded individuals may not progress at the same rate through successive trials in the acquisition of a skill.

7. "Many individuals find it difficult to adjust into the vocational rehabilitation programme directly from classroom situation because of their low adjustment potentials, physical capabilities and new psycho-social role as a worker (emotional, social and developmental). Pre-vocational training helps in developing individual's personality from being a student to a worker" (Kurani 1990:24). Individuals living in Group Homes tend to develop a routine and a work schedule. They live with other similar individuals and are provided only the periodic support in activities of daily
living, recreation and leisure time activities. This in turn
provides to them the opportunities for social interaction and
promotes their self-confidence. It is assumed that the severely mentally retarded persons living in isolated environments such as the Group Homes may perform better on vocational skills than the severely mentally retarded persons living with their families and attending day schools.

These assumptions were used to lay down the objectives for the pilot study first and then the final study.

Objectives for the Pilot Study

1. To assess whether the individuals functioning in the severe range of mental retardation have the potential to learn a vocational skill.

2. To assess whether, given sufficient training individuals with a low I.Q. in the severe range of mental retardation can achieve the same level of success as individuals with a relatively higher I.Q. in the severe range of mental retardation.

3. To determine whether learning can best occur through the visual mode, the auditory mode and the combined visual and auditory modes.

4. To determine whether a task like assembly of a ball point pen, can be correctly task-analyzed and inter-linked in the right sequential order, by the severely mentally retarded.
5. To formulate a practical strategy for instructing the individuals through the different modes and in a manner that is most efficient for optimal learning to occur.

**Materials**

For training through the visual mode: Picture-cues were used to teach sequential steps of a task by showing the individual a picture of the first step of the task to be performed and then training the individual to sequentially use the pictures to perform the remaining steps of the task. Self-monitoring was accomplished by the individual by checking off the picture, on completion of the corresponding task.

The picture-cue system had two major components: a picture-cue apparatus and four self-management steps. The picture-cue apparatus consisted of a picture sheet, a clipboard on which the sheet was fixed and a pen. Pictures representing the task were inserted into the clipboard in the pre-assigned order. The picture-cue apparatus was placed in a convenient place, easily accessible to the individuals. Training consisted of using the picture-cues to teach sequential steps of the task. The individual was shown a picture of the first step of the task to be performed and then trained to sequentially use the pictures to perform the remaining steps of the task. Self-monitoring training consisted of demonstrating by the individual how to check off the picture, and using the pen on completion of the
corresponding task. The photographs of the task material are included in appendix I.

**Sample Identification**

In order to select a sample for the pilot study visits were made to schools for the mentally retarded individuals. These included, School for Vocational Training, Lajpat Nagar, New Delhi, Cheshire Home, New Delhi, the Okhla Centre, Okhla, New Delhi, Amar Jyoti Trust, Trans-Yamuna Colony, New Delhi and 'Sahan - The Federation for the mentally retarded', New Delhi. Among these, the Okhla Centre was selected as it appeared to be the most suitable for conducting the study.

The Okhla centre was a day-school, serving around 250 mentally retarded children and adults. The centre functioned between 9.00 a.m. and 3.00 p.m. with a break in between for lunch. The centre offered educational and training programmes to individuals based on their level of I.Q. and ability for skill acquisition. The training programmes were in areas of activities of daily living and vocations such as file-board making, chalk making, candle making and box folding. Transport facility was provided by the centre, which helped all individuals to come to the centre on a daily basis. This ensured consistency in the programmes offered by the centre which was an essential requirement for the pilot study. Several visits were made by the researcher to the centre over
a period of six months to familiarize and identify oneself with the individuals and establish a rapport with them.

The sample for the pilot study consisted of 20 individuals, all in the severe range of mental retardation. "Severe mental retardation" of the sample had been determined on the basis of I.Q. tests namely Stanford Binet Intelligence Test administered by psychologists during the past two years. Individuals with associated handicapping conditions, such as visual or hearing impairment or disabilities of gross and fine motor co-ordination were not included in this study. The sample comprised adults between 18 and 25 years of age of both sexes.

<table>
<thead>
<tr>
<th>Number of students</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of I.Q.</td>
<td>25-40</td>
</tr>
<tr>
<td>Mean I.Q.</td>
<td>30</td>
</tr>
</tbody>
</table>

Research Design and Procedure

Single subject research design was used to evaluate treatment effects across the different phases of the study. Data were collected using the ABAB design.

The duration of the pilot study was one month. During the training phase of this study verbal and physical demonstrations were given for each part of the pen to each individual, towards completion of the task. Pictures of all parts of the pen were fixed on a clip-board in a sequential order. For training through the visual mode for acquisition
of the task, each individual was asked to pick the part in the sequential order, match the part with its corresponding picture and to proceed in a 'look then do' sequence. In using the auditory mode for training, individuals were not shown any pictures; instead each part was named and repeated clearly and the individuals picked the named part and proceeded to complete the task in a sequential order.

In the initial phase of the study, training was imparted to the selected individuals five days a week, two hours each day. After a two-week period, the training was stopped and data collection was withdrawn for one week. In the fourth and last week, the A and B design was again introduced in order to assess the efficacy of the training strategy.

Results

Results showed that out of 20, 13 individuals responded better to the visual mode of instruction. They were able to see the similarity between the pictures of the pen and the parts of the pen when presented together. Indeed they picked the part, placed it alongside the corresponding picture, and established similarity before attempting the assembly sequence. If a part that they picked looked similar, but was not similar to its corresponding picture, they appeared dissatisfied, indicating that there was something wrong which they could not pinpoint. On such occasions, they sought the
help of the trainer and tried to improve their performance on successive trials.

Seven individuals, identified as having limited attention span did not focus on the pictures of the task presented to them. They engaged in different behaviours. Some just ignored the pictures and looked out of the window. When their attention was drawn to the parts of the pen, they picked the parts, not in a sequential order, but in the order they thought was right. Some found the pictures amusing and commented among themselves. However these individuals could follow the instructions when commands were given verbally. They repeated the commands after the instructor in an echolalic manner and attempted to do the task in a sequential order.

All 20 individuals when presented with pictures and simultaneously given verbal commands were found to be at relative ease and attempted to complete the task.

Conclusions

Based on the pilot study the following conclusions were drawn:

1. The severely mentally retarded have the potential to learn a vocational skill. This was based on the fact that 65 percent of the individuals were able to identify the different parts of the pen, match the parts with their corresponding
pictures and proceed with the task in a sequential order. 35 percent of the individuals who found the auditory mode more stimulating and responded to verbal instructions, were also able to proceed with the task in a sequential order.

2. Given sufficient training individuals with a low I.Q. and in the severe range of mental retardation can achieve the same level of competency as individuals in a relatively higher I.Q. This was indicated by the repeated trials on the task. Initially, 40 percent of the individuals with a lower I.Q. and in the severe range of mental retardation had difficulty in identifying the different parts of the task, to focus on the task, and complete the entire task. However, with successive trials they were able to complete the task in a 'look then do' sequence and were able to perform the task as well as their peers having a relatively higher I.Q.

3. The severely mentally retarded can learn through the visual mode, the auditory mode and the combined visual and auditory modes. As 65 percent of the individuals responded to the visual mode by being able to match the part of the task with its corresponding picture, and 35 percent responded to the auditory mode and proceeded with the task when verbal instructions were given to them. All of them felt relatively easy in performing when presented with both the visual and auditory modes. Perhaps the combination of the two modes
enhanced their ability to identify the parts and to proceed with the task.

4. The severely mentally retarded individuals also have a preferred mode of learning, through which they learn best. Like others these individuals have their preferences, aptitudes and different levels of abilities. As stated earlier, 65 percent of the individuals responded to the visual mode indicating this as their preferred mode of learning, and 35 percent to the auditory mode indicating this as more stimulating to their learning.

5. The use of the different preferred modes in the instruction of the severely mentally retarded individuals can be efficiently used in their optimal learning to occur. The visual mode involved presenting to the individuals, pictures of different parts of the task and matching the different parts of the task to its corresponding picture. The auditory mode involved transmitting to them clear instructions regarding the different parts in the correct sequence. Successive trials indicated that 90 percent of the individuals were able to conceptualize the different parts of the task with the visual and auditory stimulus provided to them, and were able to proceed in a sequential order to complete the task. Furthermore, when the training procedure was withdrawn for one week and then reintroduced, 60 percent of the individuals were able to recall most of the steps involved in the task, and the
40 percent recalled some of the steps of the task. This indicated that these modes were successful in facilitating learning and acquisition of the task i.e., assembling a ball-point pen.

**Organisation of the final study**

The final study had the following objectives.

**Objectives**

1. To investigate whether the severely mentally retarded individuals can be trained for a complex vocational task such as the assembly of a ball point pen.
2. To investigate whether the severely mentally retarded individuals can be made to learn to focus on the task if the information is presented to them in visual and accoustic form.
3. To investigate whether the severely mentally retarded individuals retain and store information if the learning material presented to them is well organized (in a sequential order, broken into several steps and vividly presented).
4. To investigate whether the level of I.Q. of the individual in the severe range of mental retardation is impaired his/her competency on the job.
5. To investigate whether all severely retarded individuals respond equally well to different modes of learning, such as the visual mode, the auditory mode or the combined visual and auditory modes.
6. To investigate whether all severely retarded individuals progress at the same rate through successive trials in the acquisition of a skill.

7. To investigate whether severely mentally retarded individuals living in isolated environments such as the Group Homes perform better on vocational skills than the severely mentally retarded individuals living with their families and attending Day Schools.

Sample Identification

A systematic survey was undertaken of the Schools, Institutes and Homes in Delhi, Hyderabad and Bangalore, serving individuals with mental retardation. The purpose of the survey was to identify the universe of individuals in the severe range of mental retardation out of which the needed sample could be drawn.

The Schools visited in Delhi were:

'Sahan' - Federation for the mentally retarded, New Delhi.

'Anchal' - New Delhi.
School for the mentally retarded - Anand Vihar, New Delhi.
YMCA - New Delhi.
SMRC - School for the Mentally Retarded Children - New Delhi.
Balwant Rai Mehta Vidya Bhavan - New Delhi.
Bharatiya Vidya Bhavan - New Delhi.
Tamanna - New Delhi.
Muskan - New Delhi, and
Cheshire Home - New Delhi.

In Hyderabad:
The National Institute for the Mentally Handicapped was visited, and

In Bangalore:

NIMHANS - National Institute of Mental Health and Neuro Sciences, Bangalore.
Association for the Mentally Handicapped, Bangalore
AshaLaya - Gedlahalli Group Home, Bangalore.
Asha Niketan - Bannerghatta, Bangalore.
Rahasya Trust - Bangalore.
Opportunity Centre - Baldwin’s School, Bangalore.
School for the Mentally Retarded - Sophia’s School, Bangalore.
Vocational Centre for Mentally Retarded - Bangalore.
Asha Kiran - Bangalore.
Home for the Mentally Retarded and Mentally Ill - run by the Dept. of Social Welfare, Bangalore, and,
Organization of Parents of Mentally Retarded Children, Bangalore.

Out of these several Schools, Institutes and Homes in the three major cities serving the needs of individuals with mental retardation, a sifting process was undertaken to eliminate those which did not suit the research requirements in terms of the types of individuals served, the type and quality of services provided and the relevant age-groups. It was noted that most of the available facilities served mildly and moderately retarded children and young adults under the age of 18 for the following reasons:

1. The Schools were set up with the intent of serving only the children and young adults.
2. Individuals above 18 years of age were considered in vocational training programmes.
3. Vocational training programmes were a few in number and were also designed to accommodate the mildly and moderately mentally retarded individuals.

4. Severely mentally retarded individuals were considered 'difficult to deal with' because of their set patterns of behaviours and lack of training in skill areas of eating, dressing and toilet-use. Additionally, as they happened to be behaviourally problematic i.e., aggressive, assaultive or destructive and there were not many professionally trained and qualified staff in behaviour management and behaviour modification available to handle such individuals, they remained neglected.

5. Lack of personnel - Professionally trained and qualified special education teachers and other professionals such as (a) Behaviour Analyst, (b) Clinical Psychologist, (c) Recreation Therapist, (d) Physical and Occupational Therapist, (e) Counsellors and Case-managers were needed to function as inter-disciplinary teams to assess and formulate programmes suited to meet the needs of individuals with mental retardation and they were few.

6. Paucity of funds - This was a major area of concern. Adequate funding was needed to design suitable educational and vocational training programmes, and a basic infrastructure was required to execute these programmes. In the absence of both,
most facilities were operating with a tight budget with a minimum number of professionally trained staff.

Given the above constraints, the selected sample got restricted to Delhi and Bangalore. Caution had to be exercised in the selection process also because the sample had to be restricted to: (1) Individuals in the severe range of mental retardation, (2) In the 18-35 age group, (3) Free of associating handicapping conditions such as visual and hearing impairment and impairment in gross and fine motor coordination, (4) Free of any health problems such as being subjected to frequent seizures and, (5) Not having behavioural problems such as being aggressive and disruptive towards others and abusive towards self.

Thus, 50 individuals were found eligible to be selected from the two cities i.e., Delhi and Bangalore. They comprised two categories called Stratum I and Stratum II here.

Individuals in Stratum I were living in residential facilities (Group Homes) and individuals in Stratum II were living with their families and attending day schools. Stratum I individuals lived as near normal life as possible and were trained and supervised in activities of daily living and in some vocational areas such as packaging, pasting labels etc. These individuals followed a daily routine and were assisted in these activities during the day. Some of them were visited by their families and also got the opportunity to go home on
special occasions. The majority of them did not have any family involvement. Individuals in stratum II were living with their families at home and attended day-schools. The day-schools provided them with some academic instruction and training in some vocations such as box folding, file board making, candle making etc. The amount of time spent in the day-schools was close to 6 hours during which they were assisted to learn and acquire skills in above areas.

Research Design

As for the pilot study, for the final research a single subject research design was used to evaluate the treatment effects across the different phases of the study. The design was chosen for the following reasons: First, it enabled the assessment of the ability to do the task independently of the ability to complete self-management steps across various phases of the experiment. Secondly, the data collected prior to, during, and following the intervention allowed measurement of changes on the task performance. Third, since the sample under study was small it was possible to hold the intervening variables constant during intervention phases. Fourth, Single-subject research design rules out major threats to internal validity since the effects of the experiment can be replicated through different design variations (e.g., ABAB design, alternating treatment design and simultaneous treatment design). Finally, it allowed
flexibility to change the nature of the design, if needed, as data are evaluated over a period of time, or to combine design elements to rule out various threats to internal validity (Kratochwill and Williams, 1988). Here an ABAB design has been used to evaluate the effects of the treatment across different phases of the study. The use of the ABAB Design permitted examining the effects of the intervention by alternating the baseline condition (A phase), when no intervention was in effect, with the intervention condition (B Phase). The effects of the intervention were clearly demonstrated when performance improved during the first intervention phase, reverted to or approached original baseline levels of performance when treatment was withdrawn, and improved when treatment was reinstated in the second intervention phase. Kazdin (1982), observed that essentially, the data in the separate phases provided information about present performance, predicted the probable level of future performance, and the extent to which predictions of performance from previous phases were accurate. By altering experimental conditions in the design, one could have several different opportunities to compare phases and to test whether performance changed due to the intervention.

It has been recognized that it will be difficult to control variability in the data caused by influences in the environment and/or within the subjects. For example, events
that are remotely related to the behaviour of the subject may not be possible to be identified but they can influence variability in behaviour; such as parting of the subject with a close friend who had shifted to another town or not being able to participate in a desired sport; within subjects problems can be in the nature of a subject having a major seizure disorder which may greatly affect his/her day to day performance on a given task (Kratochwill and Williams, 1988).

**Hypotheses**

The following hypotheses were formulated:

1. Given sufficient training, the severely mentally retarded individuals will learn and perform a complex vocational task such as the assembly of a ball point pen.

2. Since the basic deficit in individuals with severe mental retardation is of 'focalization and concentration', the learning materials presented in visual and acoustic forms will enable them to absorb the information presented.

3. If the learning materials presented to the severely mentally retarded individuals are well organized (in sequential order, broken into several steps and vividly presented) they will be able to retain and store information presented.

4. The level of I.Q. of the individual in the severe range of mental retardation will not be the determinant of his competency on the job.
5. All severely mentally retarded individuals will not respond equally well to different modes of learning, such as the visual mode, the auditory mode, or the combined visual and auditory modes.

6. All severely mentally retarded individuals will not progress at the same rate through successive trials in the acquisition of a skill.

7. Severely mentally retarded individuals living in isolated environments such as the Group Homes will perform better on vocational skills than those living with their families and attending day schools.

Variables

The variables taken into account were:

Subjects I.Q.: All subjects were in the severe range of mental retardation, I.Q. range being 25-40.

2. Acquisition of skill on the task: This was measured by the number of correct responses on each trial, after the introduction of intervention. Four trials comprised one unit. Four units i.e., 16 trials were administered to each individual using visual, auditory and the combined modes. Self-monitoring, defined as the undertaking of a designated task in the assigned sequence without a supervisory prompt or directive was used as a check on the task performance. The individuals were required to complete four self-managed steps to receive credit for an independent completion. This
included (a) return to the picture-cues after completing a
task; (b) mark off the picture corresponding to that task; (c)
touch the picture of the next task; and (d) begin that task.

Materials

The material used for the final study was the same as for
the pilot study, indicated on page 57.

Procedure:

The first phase consisted of training through the
combined visual and auditory modes: In this phase of
training, the total approach was used to train the individuals
for the vocational task of assembling the ball point pen. The
individual was shown a picture of each part of the pen and
each part was named clearly in the sequential order. The
individual was expected to pick the correct part and match the
part with the corresponding picture on the clipboard and then
in a sequential order assemble a complete pen. The trainer
flipped the pages of the pictures on the clipboard. A total
of 20 trials were given towards achieving accuracy on the
task. Four trials constituted 1 (one) unit. Five units were
administered on any given day in order to assess the
progression or regression on the task.

For the purpose of quantification each correct response
was identified with a check mark and was assigned a score of
1 (one) and an incorrect response was assigned a 0 (zero).
Testing:

Following training, the individuals were tested through the visual and auditory modes for the acquisition of the skill, to establish which of these modes or the combination of modes facilitated learning and acquisition of the task.

Acquisition of task through the visual mode: In this phase of testing, the individual was shown only pictures of each part of pen in a sequential order. He was expected to pick the part, match the part with the corresponding picture, and work in a sequential order to complete the task. The trainer flipped the picture on the clipboard. A total of 16 trials were administered and before the beginning of each trial the individual was explained the procedure involved.

Acquisition of task through the auditory mode: In this phase of testing clear instructions were given to the individual with respect to the task to be performed. Each part of the pen was named and repeated, to ensure the individual was attentive and heard the named part. The parts were named in sequential order. Careful monitoring was done with respect to attending by the individual to the parts of the pen in the sequential order. The instructions were given in the language familiar to the individual. A total of 16 trials were administered and as in the preceding phase, before the beginning of each trial the individual was explained the procedure involved.
Acquisition of skill through visual and auditory modes combined: In this phase of testing, pictures of each part of pen were presented, and the parts were also named clearly in a sequential order. The students were expected to attend to the part named, pick the part, match the part with the corresponding picture of the part and assemble the pen in a sequential order following a 'look then do' sequence. The trainer flipped the pictures on the clip-board.

'Look then Do' Sequence with Self-Monitoring: In this phase, the individual completed the task following a 'look then do' sequence. Each part of the pen was picked in a sequential order by the individual and matched with the corresponding picture on the clipboard. After assembling the part, the individual checked the picture for completion, flipped it, picked the next part and went on to the next picture. No verbal commands were given. All the steps were completed in a sequential order. Using this procedure of training, an alternating treatment was implemented to evaluate the effectiveness of two interventions for improving the acquisition of the vocational task.

The following phases of assessment and intervention were included:

1. A pre-intervention assessment of performance on task: Performance was evaluated on accuracy of each step of task completed. Accuracy of task completed included all steps of
the given task as prescribed e.g. (a) Hold barrel of pen in left hand, (b) Hold stopper of pen in right hand, (c) Screw stopper using a rotary movement to Barrel of pen, (d) Pick refill of pen, (e) Insert refill into barrel of pen, (f) Pick top nozzle of pen, (g) Screw top nozzle to the barrel (point of refill protruding) using a rotary movement, (h) Pick cap of pen, (i) Fix cap on top of nozzle of pen, (j) Place finished pen in box.

2. Intervention, consisting of the visual, the auditory, and the visual and auditory modes of training and self-monitoring training.

3. Withdrawal of the intervention for a three-week period.

4. Baseline at the end of three-weeks, to assess the retention capacity on the task.

5. Reinstating intervention.

6. Follow-up, after reinstatement of intervention.

In addition to the above, qualitative data was collected through:

(a) Behavioural observations of the individuals and
(b) interviews with the Teachers and parents of the individuals.

Day to day observations and critical incidents were recorded in a diary after each visit to the Group Homes and Day Schools. Behavioural observations of individuals with severe mental retardation were recorded and interviews with
parents of these individuals, with teachers of Day Schools and staff of Group Homes were conducted. Information about the Day Schools, the setting, class-room management, students participation in class and school activities, and information about the Group Home, facilities given to the residents in the Home, visits and involvement of the families of the residents and out door activities of the residents were collected. This information has been the major source of the qualitative data presented here.

Data Analysis

Data were analysed by using both the quantitative and qualitative methods. Data on training effects were analysed by quantitative methods using

(a) percentages
(b) Chi Square
(c) t tests
(d) ANOVA.

Qualitative data has been content analysed and the information integrated with that obtained through behavioural observations, and interviews with the respondents.