IMPROVING KANNADA READING PERFORMANCE OF EDUCABLE MENTALLY RETARDED CHILDREN

ERIC (NCERT) PROJECT REPORT

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INTRODUCTION

Context, Need and Importance

Since 1920, a considerable body of research evidences have been accumulated on the reading characteristics and methods of teaching of the educable mentally retarded children. Analyses of such evidences by Duna (1954), Kirk (1964) and Cegelka and Cegelka (1970) suggest certain trends which have important consequences in understanding the reading characteristics of educable mentally retarded children. Though there are several, a few of them which have significant implications on the reading characteristics consist of the following:

- mildly retarded, as a group, does not read upto mental age expectancy, but attain close to it by attending regular grades, followed by special day schools and classes and residential facilities.

- in oral reading, the retarded are inferior to normals of the same mental age in word-attack skills. The significant errors committed by them are faulty vowel and omission of sound and the less significant errors are addition of sound and repetition. They are also inferior in the use of context clues.

- mildly retarded children who are given an extended period of reading readiness and oral language stimulation until they have a mental age of six to eight tend to catch up to those whose formal reading instruction was begun at the chronological age of six years.

- research evidences do not demonstrate the superiority of one method of teaching reading – phonic or aesthetic, over another. The emerging trend, rather suggests selection of a suitable method of teaching reading specific to the child by the teacher.

In addition to the above findings the observations of other investigators regarding the children wild milder level of learning handicap including mild mental retardation are also noteworthy. A large body of research has confirmed the learning handicapped students often experience enormous difficulty in learning and developing automaticity at the level of word identification (Ackerman and Dykman, 1982; Stanovitch, 1983). In cognitive – Behavioural Training Methods using comprehension strategies it was observed that students who were not able to decode rapidly could not make impressive gains in comprehension as compared to peers who were fast decoders. Palinscar and Brown (1984) trained students to read grade-appropriate words more than 80 words per minute with less than two errors before attempting to train them to monitor their comprehension. This implies that gains in comprehension can sometimes be obtained by training mildly handicapped students to identify words more rapidly.

The above observations reveal that reading comprehension is considerably related to speed and accuracy of word recognition. In fact, Educable Mentally Retarded (EMR) children have greater difficulty in establishing associations between sounds and symbols and rapid recognition of words which in turn are likely to contribute to difficulty in comprehension. Perhaps, special reading readiness programmes can be designed for improving their reading skills. It is equally true that such a readiness programme need not ensure complete success since all the retarded cannot be taught through a single method. Differences in reading characteristics or EMR have made it extremely difficult to teach them reading, especially in countries like India for want of

- special schools/classes for mentally retarded children.

- adequate time on the part of teachers of regular schools to give individual attention due to considerably high teacher-pupil ratio.

- instructional materials and experimentally validated procedures which take into consideration the salient features of the languages concerned.

- trained personnel to deal with such children.

In the context of universalisation of elementary education, the education of the mentally retarded assumes greater significance. Besides, the recent concern on the integration of education of children with different levels of capabilities emphasises on the attainment of maximum socialization among such children. If such an ideal has to be realized there is a need to try out instructional materials and procedures which are effective across different categories of children. This highlights the need to adopt the non-categorical approaches in classrooms. The non-categorical approaches are based on the rationale that the traditional types of students cannot be separated precisely and accurately into categories and such separations are not useful in prescribing educational practices with differential probabilities of success.

Theoretically, students classified as learning disabled (LD), educable mentally retarded (EMR) and emotionally disturbed (ED) have measurably different and behavioural characteristics. An educable mentally retarded student has a lower IQ (range 50-75) with academic achievement rate and social development rate, substantially below that of his or her pears. A learning disabled student has an average or above-average IQ test performance showing unusual scatter and academic achievement deficits in specific areas as compared

with overall assessed aptitude. An emotionally disturbed student has conduct/personality problems that may or may not be accompanied by academic deficits.

In reality, however, there are numerous similarities among the three groups along the dimensions of underachievement, personal adjustment, and adaptive behaviour. Researchers over the past two decades have been permeated with evidences indicating that psychometric categorization of students is limited both in reality and in practical applicability. Kaufman (1981) using the Wechsler Intelligence Scale for Children (Revised) found that students labelled as learning disabled, educable mentally retarded, emotionally disturbed, reading disabled and normal had similar verbal/performance discrepancies. A number of researchers have observed that children classified as learning disabled, educable mentally retarded or emotionally disturbed share common academic difficulties, particularly in the area of reading. (Kirk, 1964; Stona & Rowley, 1964; Zax, Cowen, Rappaport, Beach & Laird, 1968; Stennett, 1969; Weinstein, 1969; Cegelka & Cegelka, 1970; Larsen & Hammill, 1975).

Morsink (1984) analysed the recommendations of specialists in the fields of learning disability, EMR and emotionally disturbed through a review of major texts written between 1974 and 1984. The analysis revealed that the recommendations of the specialists were focused on methods that matched children's behaviours rather than their categories. In other words, the specialists were of the opinion that mildly handicapped students in any category may have academic deficits, and if they do, they should be taught basic skills. According to them children in any of these categories need more concrete materials, more practice and more specific feedback on their performances. In fact, evidences from studies on normal learners (Walberg, 1984), non-classified students with low socio-economic backgrounds (Stevens & Rosenshine, 1981) and students who have unlabelled reading disabilities

(Gettinger, 1982) as well as the evidences drawn from research syntheses on mildly handicapped students both in regular classes (Larrivee, 1982; Watg & Birch, 1984a, 1984b) and in special classes (Jenkins & Mayhall, 1976; Sindelar & Deno, 1978) suggest certain common elements of instruction for different categories of children. The effective remedial programme, for instance, for learning disabled, educable mentally retarded, and emotionally disturbed should include teacher-directed instruction, extensive opportunities for active academic responding with feedback, contingent reinforcement for appropriate behaviour and instruction adapted to individual needs. Invariably, teacher-directed instruction is identified as instruction that is planned and presented by the teacher (Morsink, Thomas & Smith-Davis, 1987). It is academically focused, systematic, and presented in sequential order of difficulty, beginning with student's present level of achievement. It is characterised by teacher modeling, asking low-order questions and presentation in group setting (Gettinger, 1982) or in tutorial mode (Jenkins & Mayhall, 1976). Teacher-directed instruction is contrasted with instruction that consists of brief teacher responses to the questions raised by learners while working independently.

Direct instruction, a specific example of teacher directed instruction, has been found effective across the three categories (Barrott, 1965; Isaacs & Stannett, 1980; Stephens, 1980; Cotton & Savard, 1982; Englemann & Carnine, 1982; Epstein & Cullinan, 1982).

Active academic responding is defined as a measurable response on the part of a learner-written or manipulative or verbal or gestural or their combinations that follows a teacher's question or request for performance (Morsink, Thomas & Smith-Davis, 1987). It may include independent work sheet or work-book completion, provided that this activity is closely and continuously supervised. It has been shown that mildly handicapped students

require more learning time, more trials to criterion and more practice than normal learners (Fisher & Zoaman, 1973; Heron & Skinner, 1981). It was also shown that either one-to-one instruction with a teacher or peer, or verbally interactive small-group instruction can increase students' opportunities for active responding (Gettinger, 1982; Kaufman et al., 1986). The important element in this context is the provision of controlled practice with positive teacher or peer tutor feedback (Cox & Wilson, 1981; Gable, Hendrickson, Shores & Young, 1983; Wang & Birch, 1984) rather than smaller class size.

Contingent reinforcement is related to behaviour management while teacher feedback focuses on academic performance. Academic feedback is specific and   may be used either to confirm or correct student's accuracy while contingent reinforcement is positive rather than corrective. Contingent reinforcement includes clear statements of rules, planned ignoring of inappropriate behaviour and positive reinforcement of alternative (acceptable) behaviour demonstrated by the student (Morsink, Thomas & Smith-Davis, 1987).

The cluster of methods known as adaptive instruction includes those which match individual student's needs for repeated practice, lower reading levels or simplified language and specific learning strategies that enable students to monitor their understanding of print materials.

Available evidences from researches on effective methods of teaching EMR (Algozzine, 1984), emotionally disturbed (Valcante, 1984) and learning disabled (Morsink, Branscum & Boone, 1984) students suggest that the same methods have been used successfully with students in all the three categories. Moreover, it has been observed by some of the investigators that the procedure used was effective for some students but not for others within the same samples studies. However, research reports do not indicate whether the

programmes tried out by the investigators included all the elements recommended for the teaching of EMR, learning disabled and emotionally disturbed).

Based upon the above discussion on the elements of effective remedial programme drawn from the recommendations of various investigators it can be hypothesised that the remedial programme which is effective in any one of the three is also effective in the other categories. It is also true, as evident from the above studies, that a single procedure may not be effective for all the children who belong to the same category. The main concern, in this context, is to develop common procedures for all the children who belong to a particular category and identify its effectiveness in teaching all children belonging to other categories. The remedial reading programme developed by Ramaa (1985) includes majority of the elements which are assumed to be responsible for the effectiveness of remedial programmes and it was also found effective in improving Kannada reading performance among different kinds of dyslexics. The present study aims at trying out the same programme in improving Kannada reading performance of EMR children.

REVIEW OF RELATED STUDIES

The studies which attempted to assess the reading abilities of mentally retarded in comparison with bright children and normal children as well as the studies which attempted to evaluate the effectiveness of specific methods of teaching reading to EMR were reviewed and discussed below.

A clear perspective of the reading abilities of mentally retarded children can be obtained if studies are conducted based on comparisons between mentally retarded and normal children. Such a comparison needs an appropriate basis on which mentally retarded can be equated with other groups. Whether the basis should be chronological age or mental age or intelligence quotient or combination of them is an important issue which needs to be considered. This question can be answered based on the results of a study conducted by Morphett and Washburne (1962) using samples drawn from the schools of Winnetka, Illinois

from 1928 to 1929. Morphett and Washburne (1962) in their study tested 141 children entering first grade to determine mental age and IQ progress in reading during the year using twenty-one-stops in first year reading and sight word scores. Normal reading progress was determined in relation to the number of sight words learned. After correlating the various measures used it was found that mental age showed the greatest degree of relationship to reading achievement. Some of the important observations of the experiment are:

- correlations between mental age and ability to read, as measured by reading progress and sight-word scores showed a fairly high degree of relationship. The correlations ranged from 0.50 to 0.65.

- mental age alone showed a larger degree of correlation with reading progress than did the intelligence quotient or the average of mental and chronological ages.

- when the Detroit test was used as a basis for determining mental age groups, the children who had a mental age of six years and six months made far better progress than did the less mature children and practically as satisfactory progress as did the children of a higher mental age.

- when mental age was measured by the Stanford Revision of the Binet-Simon scale, the children with a mental age of six years and six months showed better progress in reading than those of less maturity, but they made less satisfactory progress than those whose mental age was six months greater. The gain in ability upto six years and six and six months of mental age, however, was much greater than the subsequent gain.

- a repetition of the experiment in 1929-30 with different teachers, different children and different tests confirmed the earlier experiment in all its basic conclusions.

Based on the results of such experiments Marphatt and Washburne (1962) recommended the use of mental age as the criterion for measuring readiness and further suggested that the results of such a study can be treated as rule-of-thumb predicting success in learning to read. The above study revealed that children attain reading readiness at the mental age of 6-6½ years.

A number of studies have attempted to compare the mental abilities of bright and dull children of similar mental age with the intention of verifying the usefulness of mental age as a unit of measurement. Results of the studies conducted by Almack & Almack (1921), Micrehee (1939), Lewis (1940) and Thomas (1946), for instance, suggest that, in general, bright children achieve below, and dull children achieve above levels consistent with their indicated mental ages. Bliessher (1954) after reviewing such studies has commented that a direct comparison of the achievement of bright and dull children with approximately the same mental ages would show results favouring the latter. Further, it was pointed out that the older, low IQ-children have been in school longer and have been exposed to instruction in certain specific reading skills not taught in the lower grades. The review did highlight the limitation that most of the investigations of the relationship between brightness and over-and under-achievement have failed to take into consideration regression effects resulting from lack of reliability in the mental age measures which would account for some of the observed differences. Besides it was indicated that ceiling and floor effects and procedures used is extrapolating age and grade scales on standard reading tests may also be responsible for finding very little over-achievement among high IQ groups and under-achievement among groups of low IQ pupils. Thus, assuming equal variability of reading age scores and mental age scores, it is virtually impossible for a pupil at or near the 99th percentile on an

intelligence test to 'over-achieve' or a pupil near the first percentile to 'under-achieve'. Ramasheshan's (1950) study did not show any significant difference between groups with some mental age but with different chronological ages on three subjects measuring the ability to read and interpret material in specific content areas. Similarly Unsickar's (1950) findings did not suggest any significant difference between the groups matched on the basis of California mental ages.

Bliesther's (1954) study of dull and bright children varying in IQs but approximately equal mental ages did suggest that:

- bright children are significantly superior to dull children of comparable mental ages with respect to total reading comprehension and the specific abilities like locating or recognising factual details, recognising main ideas, drawing inferences and conclusions, memory for factual details, perception of relationships among definitely stated ideas and listening comprehension.

- reading rates of bright and dull children of comparable mental ages appear to be approximately the same when comparable degrees of understanding of material read are attained, with a wide range in rate being found in both groups.

- bright and dull children tend to be alike with respect to ability in word recognition and word meaning. Bright children are significantly superior to dull children of comparable mental ages with respect to the relatively more complex, intellectual and comprehension abilities.

From the above discussion, it can be observed that studies which have attempted by compare dull and bright children of almost equal mental ages are very limited in number.

Moreover lack of consensus on the results of reading abilities is strikingly visible. In spite of such contradictions there is more support to say that there is no significant differences among children with different IQs but with almost equal mental ages.

Besides the above cited studies, a considerable number of studies are there which compare mentally retarded with normals in the areas of learning, perceptual and social factors. For instance, Blackman and Heintz (1966) reviewed studies conducted in the area of perceptual processes during 1963-65 and reported that the findings of existing studies still leave unsettled the issue of whether the mildly nonorganic-retarded individual manifests perceptual deficits relative to his normal counterpart. Further they have observed that a host of studies which have examined the cognitive process like perception, discrimination skills, learning sets, transfer, concept formation and retention suggested the general finding that all these processes function in the mentally retarded, through frequently they are less affective as compared to normals. But the reason to such an observation may be due to the usage of chronological age for matching groups rather than mental age. However, such attempts are appreciable as the motivation for this line of research has been the desire to infer an underlying physiological anomaly among mentally retarded and also to have psychological foundations for special education of retarded group.

Studies of Merrill (1924) and Berrett (1965) show that on the whole, mentally retarded children learn to read upto their mental age reading grade expectance, as the children of normal or superior intelligence do. However, this is possible only with the help of an extended period of reading readiness and oral language stimulation (Dunn, 1954; Kirk, 1964; Cegelka and Cegelka, 1970). Moreover, research has not demonstrated that any one method of teaching reading-phonic, lack and say or kinesthetic – to mildly retarded, as a

group, is universally superior to another. Blackman and Heintz (1966) pointed out that the failures of such methods are due to the fact that they have been developed more or less independently of the unique patterns of learning disabilities manifested by mentally retarded individuals. Based on such observations and recommendations it can be hypothesized that the remedial reading programme which is effective for different types of dyslexics is equally effective in improving reading performance among educable mentally retarded.

National conferences on the education of the disabled and International conferences on mental retardation have clearly indicated that there are hardly any studies which have attempted to verify the hypothesis mentioned above. As such the present enquiry is structured with the focus on improving the Kannada reading performance of educable mentally retarded children.

METHODOLOGY

Objectives

- To identify the EMR children from the grades III and IV studying in Kannada medium primary schools located in Mysore city.

- To assess the reading readiness level of EMR children with 6 and more than 6 years of mental age, and to compare them with normal children of same age group.

- To identify whether the reading readiness level of EMR children is related to their Chronological Age (CA), Mental Age (MA) and/or IQ.

- To validate the effectiveness of the remedial reading programme developed for dyslexics of Kannada language in improving the reading performance among EMR children.

Hypotheses

1. There is no significant difference between EMR and normal children of same mental age in their reading readiness level taken as a whole and its constituent factors – auditory discrimination, visual discrimination and vocabulary.

2. Reading readiness level of EMR is independent of their chronological age and intelligence quotient, but dependent on their mental age.

3. The remedial reading programme developed for dyslexics of Kannada language is effective in improving the Kannada reading performance among EMR children, particularly in improving the level of letter recognition, and speed and accuracy of word recognition and reading comprehension.

Sample and Data

Identification and treatment of sample and data were done at three levels.

Level I   : Identification of EMR children.

Level II   : Assessment of reading readiness.

Level III   : Remedial reading programme.

Level I: Identification of EMR children

Operationalization of the first objective is an essential condition for the attainment of subsequent objectives of the study. Realising this fact steps were taken to identify the EMR children attending the grades III and IV in Kannada medium primary schools meant for normal children and located in Mysore city. Thought there are many Kannada medium primary schools in Mysore City, only 23 such schools were chosen for the present study based on their access and feasibility for administering different tools and techniques, and implementing the remedial reading programme. Of the 23 schools, 4 belonged to the private sector and the rest were from the Government sector. By and large these schools were attended by children belonging to low socio-economic background and those belonging to socio-economic background were much less in number. The sample was drawn from these schools based on the rationale that the incidence of EMR is considerably high among children who belong to low socio-economic origin. Since such children invariably attend Government schools more number of Government schools were selected for the study.

The EMR children from 23 primary schools were identified using the following methodology.

- children studying in grades III and IV who were poor in basic operations – reading, writing and arithmetic were identified using teachers' opinion. A list consisting of 413 such children was prepared.

- the 413 children were screened for the purpose of identifying those with problems in the sensory, speech and emotional areas of behaviours. Using techniques like self-reporting, teachers opinion and informal testing such as copying, repetitions of words and simple sentences as well as observations of certain behavioural symptoms like hpyeranxiety, depression, withdrawal and aggressive behaviour, children with sensory, speech and emotional problems were eliminated.

- teachers' opinion regarding the reading performance of children were cross validated by administering Kannada oral reading test developed by Jaya Bai (1958) (Appendix 1a). The test assesses the rate of reading among primary school children. Children whose scores on the test were less than 23, the expected score for grade II children, were considered as very poor in reading as they were   1-2 years retarded in reading. Such children were retained for further screening based on the rationale that greater the reading retardation more probable will be the existence of mental retardation among such children. Teachers' opinion with respect to the children's level of performance in writing and arithmetic skills were tested using dictation and simple arithmetic problems. The observations did reveal that those who were poor in reading were also considerably poor in writing and arithmetic skills.

- later these children were administered intelligence tests to identify the level of intelligence and locate the mentally retarded children. Using coloured progressive Matrices (Raven, 1965) (Appendix 1b), children who were average and above average and intelligence were screened out and those who were below the   Grade IV (10th percentile) were treated as mentally retarded and retained for further study. The children

who were treated as mentally retarded were subsequently administered the Verbal Intelligence Test (Binot and Kamat, 1960) (Appendix 1c) to identify the educable mentally retarded among them. The children with IQs ranging from 60 ± 5 to 75 ± 5 were considered as EMR. Fifty-eight such children were selected as per the details given in table 2a.

Table 2a

Number of children excluded and retained

Criteria	Children excluded	Children retained
1. Sensory problem	0	413
2. Speech problem	6	407
3. Emotional problem	0	407
4. Rate of reading greater than the expected for Grade II children	12	395
5. Grade on CPM greater than IV	381	114
6. Irregularity in attendance	30	84
7. IQ less than 50	2	82
IQ more than 80	21	61
MA less than 6 years	3	58

Level II: Assessment of Reading Readiness

With a view to operationalize the objective No. 2 of the study, the Reading Readiness Test developed by Devaki (1978) (Appendix 1d) was administered to 58 children whose mental age was 6 years and above. The test has three subtests; vocabulary, visual discrimination and auditory discrimination. The test was administered individually and the obtained raw scores were analysed.

The reading readiness level of EMR children was compared with that of the normal children with the objective to verify the hypothesis that EMR children of mental age 6 years and above do not differ from normal children of same mental age in the reading readiness level using t-test. Performance of the groups were compared on total test as well as sub tests.

Chi-squares were calculated to identify whether the reading readiness level is independent of chronological age, mental age and/or Intelligence Quotient. As considerable degree of relationship was observed between mental age and reading readiness level coefficient of correlation was calculated for those two variables.

Level III: Evaluating the effectiveness of the remedial reading programme

The effectiveness of the remedial reading programme developed for dyslexics in improving the Kannada reading performance among EMR children with mental age 6 years and above was ascertained using experimental design. In order to control factors like maturation and school programmes which may influence the dependent variable and also to ascertain the improvement in reading due to remedial programme, a pre-test post-test control group design were used. The frame work of the design is given in table 2b.

Table 2b

Experimental design

Group	Pre-test	Treatment	Post-test
Experimental	Measurement of level of letter recognition, speed and accuracy of word recognition and level of reading comprehension.	Remedial Reading programme	Measurement of level of letter recognition, speed and accuracy of word recognition and level of reading comprehension
Control letter	Measurement of	-	Measurement of

	level of recognition, speed and accuracy of word recognition and level of reading comprehension		level of letter recognition, speed and accuracy of word recognition and level of reading comprehension.

The dependent variables were assessed using the following tests.

1. Kannada Letter Recognition Test

2. Kannada Oral Reading Test

3. Kannada Word Recognition Test

4. Kannada Reading Comprehension Test

Details of these tests are given in Appendix 1e, 1a, 1f and 1g respectively.

Sample: The remedial treatment was attempted only on those children whose reading readiness was assessed. Out of the 14 schools which had such children only 6 schools which were close to each other and had more number of EMR children were selected for experimentation. This was done with the intention of minimizing the time required for moving from school to school during remediation and also to control school and locality related variables.

Out of the 36 EMR children who were studying in the 6 schools, two comparable groups 'A' and 'B' consisting of 10 children each were drawn up. The groups were matched on sex, age, type of school, grade in which studying, mental age, reading readiness level, level of academic performance as indicated by teachers' opinion and informal testing by the investigator (for details see Table 2c).

Table 2c

Criteria of matching of groups

Sl. No.	Variables	No. of children in Group A	No. of children in Group B
1	Sex:		
	Boys	7	7
	Girls	3	3
2	Grade Attended		
	III	1	1
	IV	9	9
3	Mental Age		
	6-7 years	4	4
	7-8 years	6	4
	8-9 years	0	2
4	Reading Readiness Level		
	Above average more than M+1SD	0	1
	Average M-1SD to M+1SD	10	9
	Below Average less than M-1SD	0	0
5	Teachers' opinion about academic performance	Very poor	Very poor

The data in the table 2c illustrate that the groups were batched on the various related variables.

Pre-test

The dependent variables – level of letter recognition, speed and accuracy of word recognition and level of reading comprehension were assessed among the members of both the groups by individually administering the tests. The mean performance of the groups on these tests were compared using t-test of significance to verify the assumption that the groups do not differ from each other significantly. Results are shown in tables 2d, 2e, 2f and 2g.

Table 2d

**Number, Mean, SD and t-ratio of the two groups on
Kannada Letter Recognition Test**

Groups	Number	Mean	SD	t-ratio
A	10	56.5	23.05	1.86*
B	10	73	13.09	

* Not significant. For df 18, the table value for 0.05 level is 2.10 and for 0.01 level is 2.88.

Table 2e

**Number, Mean, SD and t-ratio of the two groups on
Kannada Word Recognition Test**

Groups	Number	Mean	SD	t-ratio
A	10	30.2	23.72	1.83*
B	10	49.4	20.65	

* Not significant.

Table 2f

**Number, Mean, SD and t-ratio of the two groups on
Kannada Oral Recognition Test**

Groups	Number	Mean	SD	t-ratio
A	10	5.5	6.48	2.36*
B	10	12.3	5.68	

* Significant at 0.05 level.

Table 2g

**Number, Mean, SD and t-ratio of the two groups on
Kannada Reading Recognition Test**

Groups	Number	Mean	SD	t-ratio
A	10	4.3	3.49	1.61*
B	10	7.2	4.31	

* Not significant.

Results in the above tables suggest that though both the groups did not differ significantly on level of letter recognition, word recognition and reading comprehension, they did differ significantly on speed of word recognition.

In fact, it is expected that the experimental and control groups should not differ significantly on pre-test scores. However, the groups did differ significantly on the speed of word recognition. Nevertheless, it can be observed from the tables that the mean performances of Group A is low as compared to that of the Group B on all the tests. Though attempts were made to equate the groups on pre-test scores on all its dimensions, it was not completely successful for the following reasons. It was not practically feasible to match the groups on all the four variables without altering the status of the groups with reference to the more basic variables like sex, mental age, rending readiness level, etc. The four measures of reading were not additive and the relative ranks of children were varied from measure to measure.

Because of these reasons and since the groups were matched on three pretest variables except one, the groups were retained for the experiment. Group A whose mean performance was low on all the tests was considered as the experimental group and the group B was treated as control group.

Control of the Intervening Variable

With a view to provide uniform treatment to all the EMR children and to avoid the influence of intervening variable like special efforts to teach them at home, the respective parents were instructed individually not to provide academic assistance either by tutoring at home or by sending them to tuition centres.

Treatment

The experimental treatment consisted of administration of the remedial reading developed for dyslexics children by Ramaa (1984), individually. The details about the nature of the programme and the administration procedure are given in the Appendix II. The remediation programme required 60-70 sessions of 45-60 minutes each. The children were allowed to learn at their own pace.

Post-test

Both the groups were assessed on the four dependent variables by administering the same set of tests individually.

Analysis of the data

The obtained data were analysed using t-test and ANACOVA. The ANACOVA was used because of the initial difference between the two groups on one of the pre-test scores. The various errors committed by the children while recognising the words during pre-test and post-test were classified and the mean frequency of each type of error was compared between the groups on pre-tests and post-tests as well as between the tests within each group.

ANALYSIS AND INTERPRETATION

Assessment of Reading Readiness among EMR Children

Comparison between EMR and Normal Children in Reading Readiness

In order to met the second objectives and to verify the hypothesis, there is no significant difference between EMR and normal children of same mental age in reading readiness level taken as a whole as well as its constituent factors, t-test of significance was used. The mean performance of EMR children of 6-7 years were compared with that of

normal children of 6-6½ years, who formed the sample for the standardization of the test (Devaki, 1978). It was assumed that the mean mental age is equal to mean chronological age among normal children and considered as equivalent. Table 3a gives the details of the analysis.

Table 3a

Mean, N, SD and t-ratio of the two groups on the total Reading Readiness Test

Type of children	Mental age	N	Mean	SD	t-ratio
Mentally retarded	6-7 years	23	83.6	15.96	2.58[*]
Normal	6-6½ years	15	96.45	13.60	

* Significant at 0.05 level.

The t-value indicates that the two groups differ significantly and the mentally retarded children of 6-7 years are inferior to normal children of 6-6½ years in reading readiness. This suggests that there exists certain lag in the development of reading readiness skills among EMR children. Further analyses were done to identify the groups differences in the three readiness skills. Details of the analyses are given in tables 3b, 3c and 3d.

Table 3b

Mean, N, SD and t-ratio of the two groups on the vocabulary subtest of the Reading Readiness Test

Type of children	Mental age	N	Mean	SD	t-ratio
Mentally retarded	6-7 years	23	17.70	2.43	2.71[*]
Normal	6-6½ years	15	18.90	1.10	

* Significant at 0.05 level.

The observed t-value is more than the table value expected at 0.05 level of significance indicating the difference method in the mean performance between the two groups is significant. This implies that development of vocabulary among EMR is at low level as compared to normal children of same mental age.

Table 3c

Mean, N, SD and t-ratio of the two groups on the visual discrimination subtest of the Reading Readiness Test

Type of children	Mental age	N	Mean	SD	t-ratio
Mentally retarded	6-7 years	23	19.48	4.83	4.28[*]
Normal	6-6½ years	15	24.70	2.50	

* Significant at 0.01 level.

It is visible from the result that there exists significant difference between EMR and normal children on visual discrimination skill and the EMR children's level of performance on visual discrimination is much less as compared to normal children.

Table 3d

Mean, N, SD and t-ratio of the two groups on the auditory discrimination subtest of Reading Readiness Test

Type of children	Mental age	N	Mean	SD	t-ratio
Mentally retarded	6-7 years	23	45.18	10.19	2.37[*]
Normal	6-6½ years	15	53.18	8.43	

* Significant at 0.05 level.

Results in table 3d reveal that there is a considerable lag in the auditory discrimination skill among EMR children as compared to normal children of same mental

age. The obtained evidences, thus, do not support the hypothesis that there is no significant difference between EMR and normal children of same mental age in their reading readiness level taken as a whole as well as its constituent parts. On the other hand, the evidences do suggest significant differences between the groups on reading readiness level whether considered as a whole or in terms of its components.

The above analyses suggest that EMR children of 6-7 years are considerably low in total reading readiness as well as in its sub-components compared to normal children of 6-6½ years. EMR children of 6-7 years of mental age are more or less equal to normal children of 4-5 years of age.

Further analysis was done to identify the mental age level of EMR children that is equivalent to the mental age of normal children of 6-6½ years of age. As such comparisons were done between normal children of 6-6½ years of age and EMR of 7-8 years of age on the reading readiness as a whole as well as on its different components.

Table 3e

**Mean, N, SD and t-ratio of the two groups on vocabulary subtest
of the Reading Readiness Test**

Type of children	Mental age	N	Mean	SD	t-ratio
Normal	6-6½ years	15	18.90	1.10	1.61[*]
EMR	7-8 years	28	19.79	2.45	

* Not significant

Though the mean performance of EMR on vocabulary subtest is marginally higher than that of normal children, the difference is not statistically significant. This indicates that

the EMR children of mental age 7-8 are equal to normal children of   6-6 years of age in

vocabulary.

Table 3f

**Mean, N, SD and t-ratio of the two groups on the visual discrimination subtest
of the Reading Readiness Test**

Type of children	Mental age	N	Mean	SD	t-ratio
Normal	6-6½ years	15	24.70	2.50	1.38[*]
EMR	7-8 years	28	23.54	2.65	

* Not significant

Results in table 3f suggest that EMR children of 7-8 years of mental age are equal to

normal children of 7-8 years of mental age are equal to normal children of   6-6 ½ years of

age in visual discrimination.

Table 3g

**Mean, N, SD and t-ratio of the two groups on the auditory discrimination subtest of the
Reading Readiness Test**

Type of children	Mental age	N	Mean	SD	t-ratio
Normal	6-6½ years	15	53.18	8.43	0.97[*]
EMR	7-8 years	28	50.29	9.70	

* Not significant

Lack of statistical significance for the difference observed between the two groups on auditory discrimination indicates that EMR children of 7-8 years of mental age are equal to normal children of 6-6½ years of age in auditory discrimination.

Table 3h

Mean, N, SD and t-ratio of the two groups on the total Reading Readiness Test

Type of children	Mental age	N	Mean	SD	t-ratio
Normal	6-6½ years	15	96.45	13.60	0.71[*]
EMR	7-8 years	28	93.46	11.05	

* Not significant

Results in table 3h indicate that the observed mean difference between the groups is not statistically significant. It implies that the EMR children of 7-8 years of mental age are equal to normal children of 6-6½ years of age in reading readiness.

The above analysis suggests that the gap between the normal children and EMR children in reading readiness as a whole and in its sub skills, has decreased at a little higher mental age. It can be noticed that the EMR of 6-7 years of mental age are equal to normal children of 4-5 years of age whereas the EMR of 7-8 years of mental age are equal to normal children of 6-6½ years of age in reading readiness.

Dependence of reading readiness on mental age, chronological age and intelligence quotient

The dependence of reading readiness on MA, CA and IQ was analysed using Chi-square. The EMR children were classified into different groups; average, below average and above average in reading readiness. The mean and SD of the scores on the total reading

readiness test were calculated to determine the out-off points. Thus a score lying between M+1SD and M-1SD is considered as average performance. A score below M-1SD is treated as below average performance and a score above M+1SD is treated as above average performance. Sicne there were only two children who were above average 2x2 table was thought to be appropriate for computing   Chi-square. Details of the analysis are given in tables 3i, 3j and 3k.

Relationship between Reading Readiness and Mental age:

Table 3i

**Contingency table showing relationship between
Reading Readiness and Mental age**

Groups	6-7.6 years	7.7-9 years	Total
Average	21 (17.83)	6 (9.16)	27
Below average	16 (19.16)	13 (9.83)	29
Total	37	19	56

$\chi^2 = 3.18$; p lies between 0.10 and 0.05 levels.

From the above table it is clear that χ^2 value is not significant either at 0.01 level or 0.05 level. This indicates that reading readiness is independent of mental age. It means that this evidence apparently does not seem to support one of the contentions, the reading readiness level of EMR children is dependent on their mental ages, of the second hypothesis. Since, the value is significant at 0.01 level, empirically it is not sound to neglect the existence of relationship between reading readiness and mental age. Accordingly, the extent of relationship between the two variables was identified by calculating coefficient of correlation.

The obtained coefficient of correlation, r=0.45, indicates a positive and moderate correlation between the two variables. This suggests that mental age to a considerable extent, has significant relationship with reading readiness. In other words the level of reading readiness increases to a considerable extent along with the increase in mental age among EMR children.

Relationship between Reading Readiness and Chronological Age:

Table 3j

**Contingency table showing relationship between
Reading Readiness and Chronological Age**

Groups	6-7.6 years	7.7-9 years	Total
Average	16 (16.39)	11 (10.60)	27
Below average	18 (17.60)	11 (11.39)	29
Total	34	22	56

$\chi^2 = 0.038$; p lies between 0.90 and 0.80 levels.

The obtained χ^2 value is insignificant and it implies that the reading readiness level of EMR children is independent of their chronological age. The evidence does support one of the contentions of the second hypothesis.

Relationship between Reading Readiness and Intelligence Quotient:

Table 3k

**Contingency table showing relationship between
Reading Readiness and Intelligence Quotient**

Groups	55-70	70-80	Total
Average	12 (10.60)	15 (16.39)	27

Below average	10 (11.39)	19 (17.60)	29
Total	22	34	56

$\chi^2 = 0.56$; p lies between 0.50 and 0.30 levels.

The lack of significance of χ^2 value indicates that the level of reading readiness is not dependent on the range of Intelligence quotient. In other words, the finding suggests that the reading readiness level of EMR children is independent of intelligence quotient. The overall finding indicates that the reading readiness level of EMR children, though is independent of chronological age and intelligence quotient, it is dependent to certain extent on the mental age.

Effectiveness of the remedial reading programme in improving the reading performance among EMR children:

The hypothesis, the remedial reading programme developed for dyslexics of Kannada language is effective in improving the Kannada reading performance among EMR children, particularly in improving the level of letter recognition, speed and accuracy of word recognition and reading comprehension, was verified with the help of data obtained through experimentation. The data were analysed using analysis of co-variance. Details of analysis are shown in tables 3l, 3m, 3n and 3o.

Effectiveness of the remedial programme in improving the accuracy of Kannada letter recognition:

Table 3l

Analysis of covariance – Kannada Letter Recognition Test

Experimental Group		Control Group	
Pre-test (X)	Post-test (Y)	Pre-test (X)	Post-test (Y)
50	96	67	94
89	99	86	88
62	97	82	90
29	97	66	75
7	67	92	98
73	90	83	85
55	100	75	80
81	100	44	44
66	85	70	60
53	90	65	70
Total 565	921	730	784
Mean 56.5	92.1	73	78.4

	Overall	
	X	Y
Totals	1295	1705
Mean	129.5	170.5

Analysis of Sums of Squares and Products

Source	df	χ^2	$\sum XY$	$\sum Y^2$
Total	19	8387.75	2011.25	4367.75
Between Classes	1	1361.25	-1130.25	938.45
Within Classes	18	7026.50	3141.60	3429.30

Reduction due to regression	1		$3141.5^2/7026.5$	1404.54
Deviation from regression	17			2024.75

Deviations   Mean Square = 2024.76/17 = 119.10

$$b = \Sigma XY/\Sigma X^2 = 3141.50/7026.50 = 0.44$$

The adjusted means

_____

$A = Y_1 - b(X_1 - X) = 92.1 - 0.44(56.5 - 129.5) = 124.22$

$B = Y_2 - b(X_2 - X) = 78.4 - 0.44(73 - 129.5) = 103.26$

_____

$$S_1^2 = S_{Y.x}^2 \left[1 - \frac{tx2}{\Sigma x^2} \right]$$

$S_1^2 = 142.0863$

$S_1 = 11.91$

$S_D = 11.91 \times \sqrt{.1} = 3.573$

$A - B = 20.96$

t-value = 20.96/3.573 = 5.86

Table value (one-tailed) at 0.10 (0.05) = 0.74

at 0.02 (0.01) = 2.54

Results in table 3l indicate that the obtained t-value is greater than that of table value expected at 0.01 level. This suggests that the mean performance of the experimental group in post-test on Kannada letter recognition test is significantly better than that of control group.

The improvement in Kannada letter recognition among children of experimental group can be attributed to the experimental treatment.

Effectiveness of the remedial programme in improving the accuracy of Kannada word recognition:

Table 3m

Analysis of covariance – Kannada Word Recognition Test (Accuracy)

Experimental Group		Control Group	
Pre-test (X)	Post-test (Y)	Pre-test (X)	Post-test (Y)
23	91	69	82
67	98	62	68
33	93	64	79
4	87	32	48
0	58	72	91
16	67	69	70
27	96	50	40
78	100	11	20
34	65	44	34
20	75	21	20
Total 302	830	494	552
Mean 30.2	83	49.4	55.2

	Overall	
	X	Y
Totals	796	1382
Mean	79.6	138.2

Analysis of Sums of Squares and Products

Source	df	χ^2	$\sum XY$	$\sum Y^2$
Total	19	11735.2	4230.4	12155.0
Between Classes	1	1834.2	-2668.8	3864.2
Within Classes	18	9892.0	6899.2	8291.6
Reduction due to regression	1		$6899.2^2/9892$	4811.86
Deviation from regression	17			3479.74

Deviations   Mean Square = 3479.74/17 = 204.69

$$b = \sum XY/\sum X^2 = 6899.2/9892 = 0.69$$

The adjusted means

_____

$A = Y_1 - b\,(X_1 - X) = 83 - 0.69\,(30.2 - 79.6) = 117.08$

$B = Y_2 - b\,(X_2 - X) = 55.2 - 0.69\,(49.4 - 79.6) = 76.03$

_____

$$S_1^2 = S_{Y.x}^2 \left[1 - \frac{tx2}{\sum x^2} \right]$$

$S_1^2 = 242.76$

$S_1 = 15.58$

$S_D = 15.58 \times \sqrt{.1} = 4.674$

$A - B = 117.08 - 76.03 = 41.05$

t-value = 41.05/4.674 = 8.78

Table value (one-tailed) at 0.10 (0.05) = 1.74

                    at 0.02 (0.01) = 2.54

Since the t-value is significant at 0.01 level it can be explained that the mean performance of the experimental group in post-test on Kannada word recognition test is significantly better than that of the control group. The implication is that the remedial reading programme is effective in improving Kannada word recognition skill among EMR children.

Effectiveness of the remedial programme in improving the speed of Kannada word recognition among EMR children:

Table 3n

Analysis of covariance – Kannada Word Recognition Test (Speed)

Experimental Group		Control Group	
Pre-test (X)	Post-test (Y)	Pre-test (X)	Post-test (Y)
2	12	20	26
14	29	8	13
2	19	11	13
0	11	11	14
0	7	18	25
3	21	14	15
4	28	21	21
21	24	2	8
7	16	10	8
2	26	8	8
Total 55	193	123	163
Mean 5.5	19.3	12.3	16.3
	Overall		
	X		Y
Totals	178		356
Mean	17.8		35.6

Analysis of Sums of Squares and Products

Source	df	χ^2	ΣXY	ΣY^2
Total	19	973.8	280.6	605.2
Between Classes	1	231.2	-102.0	45.0
Within Classes	18	742.6	382.6	560.2
Reduction due to regression	1		$302.6^2/742.6$	197.12
Deviation from regression	17			363.08

Deviations Mean Square = 363.08/17 = 21.35

$$b = \Sigma XY/\Sigma X^2 = 382.6/742.6 = 0.51$$

The adjusted means

_____

$A = Y_1 - b\,(X_1 - X) = 19.3 - 0.51\,(5.5 - 17.8) = 25.573$

$B = Y_2 - b\,(X_2 - X) = 16.3 - 0.51\,(12.3 - 17.8) = 19.105$

_____

$$S_1^2 = S_{Y.x}^2 \left[1 - \frac{tx2}{\Sigma x^2} \right]$$

$S_1^2 = 27.9685$

$S_1 = 5.28$

$S_D = 5.28 \times \sqrt{.1} = 1.584$

$A - B = 6.468$

t-value = 6.468/1.584 = 4.08

Table value (one-tailed) at 0.10 (0.05) = 1.74

at 0.02 (0.01) = 2.54

Results in table 3n indicate the significance of t-value at 0.01 level. It means that the mean performance of the experimental group is significantly better than that of the control group on Kannada oral reading test which assess the speed of Kannada word recognition. The observed improvement among EMR children of the experimental group can be attributed to the effectiveness of the remedial reading programme.

Effectiveness of the remedial programme in improving the level of reading comprehension among EMR children:

<div align="center">

Table 3o

Analysis of covariance – Kannada Reading Comprehension Test

</div>

Experimental Group		Control Group	
Pre-test (X)	Post-test (Y)	Pre-test (X)	Post-test (Y)
5	19	6	12
8	21	17	25
12	19	10	18
4	17	5	6
0	8	7	10
1	9	9	9
0	14	2	2
5	12	2	4
4	8	10	10
4	11	4	6
Total 43	138	72	102
Mean 4.3	13.8	7.2	10.2
	Overall		
	X		Y
Totals	115		240
Mean	11.5		24

Analysis of Sums of Squares and Products

Source	df	χ^2	ΣXY	ΣY^2
Total	19	349.75	318	708
Between Classes	1	42.05	-52.2	64.80
Within Classes	18	307.70	370.2	643.20
Reduction due to regression	1		$370.2^2/307.7$	445.39
Deviation from regression	17			197.81

Deviations   Mean Square = 197.81/17 = 11.63

$$b = \Sigma XY/\Sigma X^2 = 370.2/307.7 = 1.203$$

The adjusted means

_____

$A = Y_1 - b\,(X_1 - X) = 13.8 - 1.203\,(4.3 - 11.5) = 22.46$

$B = Y_2 - b\,(X_2 - X) = 10.2 - 1.203\,(7.2 - 11.5) = 15.37$

_____

$$S_1^2 = S_{Y.x}^2\left[1 - \frac{tx2}{\Sigma x^2}\right]$$

$S_1^2 = 13.21168$

$S_1 = 3.63$

$S_D = 3.63 \times \sqrt{.1} = 1.089$

$A - B = 7.09$

t-value = 7.09/1.089 = 6.51

Table value (one-tailed) at 0.10 (0.05) = 1.74

                at 0.02 (0.01) = 2.54

The obtained results in table 3o suggest better performance of the Experimental group than that of the control group on the Kannada reading comprehension test after experimental treatment. It indicates the effectiveness of the remedial reading programme in improving the level of Kannada reading comprehension among EMR children. The overall evidences suggest the effectiveness of remedial reading programme in Kannada in improving the level of letter recognition, speed and accuracy of word recognition and the level of reading comprehension in Kannada among the EMR children and thus support the hypothesis.

Error Analysis

Besides the above statistical analysis, further attempts were made to identify the effectiveness of the programme in reducing the different kinds of errors committed by EMR children while recognizing Kannada words. Though two word recognition tests were administered during experimentation, the errors committed while taking the test which assessed only the accuracy and not the speed (Kannada word recognition test) were considered. While administering the test children were allowed to recognize the words as a whole or by adopting word attacking skills viz. identifying individual letters and then blending. The actual responses given by the children were recorded.

All the errors committed by the children of experimental and control groups during pre-testing and post-testing situations were classified initially and the following types of errors were identified.

- word substitution error

- letter substitution error

- kagunitha substitution error

- blending error

- reversal error

Word Substitution Error

When a different word is substituted in the place of a stimulus word it is considered as a word substitution error. Readers commit word substitution errors only when they attempt to perceive the whole word.

Letter Substitution Error

Letter substitution error occurs when a child tries to identify individual letter and confuses it with another letter which may or may not have visual and/or auditory similarity with it.

Kagunitha Substitution Error

Kagunitha is a symbol system which represents consonantly different vowel sounds. In Kannada language, like most of the Indian languages, each consonant combines with 16 vowel sound and creates combination of sounds. Thus Kagunitha substitution error occurs when the child confuses one Kagunitha for the other. For example, ki for ke, te for to.

Sound Blending Error

Even after recognizing the letters and Kagunitha correctly, the reader may fail to blend the individual sounds properly which may prevent him in recognizing the word correctly. These errors are called sound blending errors and three types of such errors were identified. They consist of the following:

Omission of Stress Sounds

It was noticed in the study that while blending, the children sometimes omitted the stress sound. For example, 'akka' was read as 'aka' and 'katte' as 'kate', etc.

Omission/Addition of nasal sounds

Children's difficulty in blending the nasal sounds was indicated in their attempt to omit the nasal sounds. For example, 'Bundi' was read as 'Budi' and 'Thangi' was read as 'Thagi', etc. On the other hand, sometimes, the nasal sounds were added to the words where they were not required. For example, 'Mamsa'; instead of 'Masa'.

Producing different words/non-words

This type of errors occurred when the child identified every letter of the word correctly, but while blending produced altogether a different word or non-word. For example, the child identified the letters of the word 'rasa' correctly but read it as 'agasa'.

Reversal errors

Reversal errors are those errors in which the order of the sounds are reversed in the stimulus word or part of the stimulus word. Examples of such errors are 'sara' for 'rasa', 'Jayamana' for 'Yajamana'.

After the classification of errors into the various types mentioned above the frequency of occurrence of each type of errors committed by the experimental and control groups were counted separately. The mean frequency of each type of errors committed by the groups during the testing situations are given in table 3p.

Table 3p

Errors committed by the groups during pre-testing and post-testing situations

Sl. No.	Type of reading error	Mean frequency of reading error	Mean frequency of reading error

		Experimental group		Control group	
		Pre-test	Post-test	Pre-test	Post-test
1	Word Substitution Error	5.9	1.9	6.3	5.1
2	Letter Substitution Error	18.9	2.4	15.3	10.3
3	Kagunitha Substitution Error	17.6	2.9	16.8	12.1
4	Sound Blending Error				
	a) Stress sound	7.3	1.2	8.2	4.4
	b) Omission/addition of nasal sound	6.3	3.6	4.5	4.2
5	Producing different word/ non-word	3.5	0.8	2.2	2.2
6	Reversal	0.5	0.1	0.4	0.2

Data in table 3p show considerable amount of reduction in the mean frequency of each type of errors committed by the children in the experimental group as compared to those in the control group. reduction of errors committed by the children of experimental group further substantiates the effectiveness of the experimental treatment in improving the reading performance.

DISCUSSION

The study observes that the educable mentally retarded children of 6-7 years of mental age are inferior to normal children of 6-6½ years of chronological age in reading readiness level. Further analysis of performance in the three components of reading readiness – vocabulary, auditory discrimination and visual discrimination using the same groups of children reveals that the groups differ significantly on all the three components and the

mentally retarded lag behind the normal children in all the three components. The finding of the study contradicts the earlier findings. For instance, Bilisther's (1954) observation that bright and dull children tend to be alike with respect to ability in word recognition (which requires skills in auditory and visual discrimination) and word meaning (vocabulary). Nevertheless it supports the findings of the studies which compared dull children with normal children (Heintz, 1966) and found that learning and perceptual processes are effective in the case of dull children.

The lack of consensus among the findings of these studies may be due to the limitations of the studies themselves.

The studies reviewed by Heintz (1966) used chronological age as a criterion for matching the mentally retarded with the normal children. In the present study, because of non-availability of data related to the mental age of the normal children with whom the EMR children are compared, their mental age is considered to be equal to their chronological age. It will be possible that there might have been a few above average students in the group of normal children who might have magnified the observed differences between the groups. However, it appears to be too early to come to any conclusion regarding the equality of mentally retarded with the other groups (normal and bright children) with reference to reading readiness level.

The study reveals that the mentally retarded children of mental age 7-8 years are almost equal to normal children of 6-6½ years of age in the total reading readiness level as well as in all the three subcomponents. The EMR children of mental age   6-7 years are found to be equal to normal children of 4-5 years of age, EMR of   7-8 years of mental age are found to be equal to normal children of 6-6½ years of age.

This suggests that the gap between the normal children and EMR children in their reading readiness as a whole and in its component skills decreases at a little higher age. The implication is that EMR children will be ready for reading at the age of 7-8 years of mental age and not earlier from that.

The study, further, indicates that the level of reading readiness among EMR children has significant relationship with mental age and there was no such relationship with either chronological age or intelligence quotient. This finding is in line with the earlier findings (Morphett and Washburne, 1962). In Morphett and Washburne's (1962) study the reading ability to read was measured through reading progress and sight-words whereas in the present study reading ability was assessed through visual and auditory discrimination and vocabulary. The inference is that reading performance as well as readiness to read among EMR children are primarily related to MA and not to CA or IQ.

The experiment conducted to verify the effectiveness of the remedial reading programme developed for dyslexics in improving Kannada Reading Performance among EMR children, reveals that the programme is quite effective in improving the level of letter recognition, speed and accuracy of word recognition and the level of reading comprehension. The findings are in congruence with earlier studies and suggest that any remedial programme which is effective in improving reading performance among learning disable would be equally effective for EMR children. Morsink, Thomas and Smith Davis (1987) pointed out that the procedures which were successfully used across different categories of mildly handicapped children (EMR, Learning Disabled and Emotionally Disturbed) to improve their reading performance were actually failed to improve the same among all the children of a particular category. But this is not true in this study. In fact, the remedial programme that

was tried out in this study improved the reading performance of all the EMR children (N=10).

The success of the programme across the categories as well as among all the EMR children can be attributed to the fact that the remedial programme is based on the underlying processes of reading and also on the specific principles recommended by various investigators for developing remedial reading programme.

Interestingly it was noticed that without any specific attempt to improve reading comprehension among the children of the experimental group there were considerable improvement in the level of reading comprehension in comparison with the control group. This can be attributed to the improved efficiency in recognising words as a result of remediation. This finding supports the view that attempts to improve the level of word recognition among the mildly handicapped children should proceed the training in comprehension (Palinscar and Brown, 1984).

The analysis of the errors committed by the EMR children while recognising Kannada words reveals that they commit the same kinds of errors which are usually committed by dyslexics (Ramaa, 1985). The frequency of letter substitution and Kagunitha substitution errors are highest compared to the frequency of other kinds of errors indicating that even at the grades III and IV EMR children have difficulty in learning Kannada letters and kagunitha. In addition to the difficulty in associating names with the visual features of the letters (as revealed through letter substitution and kagunitha substitution errors), they have considerable difficulty in blending the sounds which is reflected in the sound blending errors committed by them. they have greater difficulty in blending sounds when stress sounds (double consonants) and nasal sounds occur in between. Like dyslexics, EMR children

produce different words/nonwords while blending the correctly identified sounds. This may be due to either deficiency in sequential memory for verbal units or lack of knowledge about the correspondence between isolated sounds and words.

The frequency of word substitution errors is less and this may be due to the fact that the EMR children of the present study were reading at the letter level and not at the word level, without which there is no scope for committing word substitution errors. The frequency of reversal errors are least among the EME children. This can be attributed to fewer attempts among EMR children to recognize the words as a whole. Besides, the list of words does not include many words which provide scope for meaningful reversal.

The remedial reading programme tried out in the study is found to be quite effective in reducing all types of errors to a considerable extent. The same programme was found to be successful in reducing the same kinds of errors among different types of dyslexics also (Ramaa, 1985).

The finding that the remedial programme is equally effective even in the case of children whose mental age is 6-7 years but whose reading readiness level is equal to that of normal children of 4-5 years has important implications. It implies that if EMR children are of 6 years of mental age, they can be exposed to reading using the kind of remedial reading programme which is tried out in this study without any prior reading readiness programme. This has important consequences in Indian context where majority of children enter primary schools without preschool training which provides the context for developing reading readiness.

It appears from the findings of the present study as well as those of the studies on remediation of dyslexics (Ramaa, 1985) that the remedial programme may be more effective

in improving Kannada reading performance among slow learners, emotionally disturbed and socially disadvantaged. A teacher can teach Kannada reading to any child who is severely retarded in reading even without knowing the cause of retardation. Besides, teachers can train parents to use the same remedial material in improving reading of their retarded children.

In general the findings of the present study support some of the theoretical assumptions and research findings related to remedial reading for mildly handicapped children. At the same time it contributes to improved methods of teaching reading to mentally retarded children. This helps in meaningful integration of different categories of mildly handicapped children for the purpose of teaching reading through the remedial programme is quite useful in improving the accuracy of word recognition, it is not so effective in increasing the sound of word recognition. There should be deliberate attempts for appealing the EMR children for rapid reading. Increased speed and accuracy of word recognition would contribute to the level of reading comprehension. However, specific efforts to increase the reading comprehension are needed. Future researches on EMR children should focus on the attainment of automaticity in reading and nature and level of comprehension of the passage read.

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APPENDIX – I

DESCRIPTION OF THE TESTS

Appendix – I(a): Kannada Oral Reading Test

The test was developed by Jaya Bai (1958) to assess the speed and accuracy of oral reading for the seven grades of primary schools from Grade II through VIII.

The preliminary test consisted of 320 Kannada words and was administered to a group of children of both the sexes. During pre-tryout stage the subjects took their own time to read those words. After pre-tryout 150 words were selected for the final tryout. For the final tryout, the selected 150 words were administered to 416 girls students of the seven grades II through VIII of the primary school. The sample was randomly drawn from seven primary schools situated in different areas of Mysore city.

In the final form, 150 words are arranged in the order of difficulty. These words are printed in 22 lines each consisting of seven words except the last line which consists of only three words. Space has been left between two words to distinguish them from the continuous matter. The subject has to read the words horizontally and soon after he finishes the last word in the previous line, he has to proceed to the first word of the next line.

It is an individually administered one minute scale. The number of correctly read words within a minute has to be noted down. One score is given for every correctly read word.

The reliability coefficient of the test final by the test-retest and odd-even split-half methods were 0.98 and 0.81 respectively.

Validity of the test was determined by calculating the coefficient of correlation between the test scores and examination marks in Kannada, and also between the test scores and the teacher's estimates which were 0.36 and 0.57 respectively.

Taken the test as a whole, it was found that the test was at 53 per cent of difficulty. This level of difficulty was a little below the accepted level (50 per cent). Though, it suggests that the test was a little easier, since the difference was not much, the author has considered that the test was more or less of 50 per cent difficulty level. norms were developed in the form of mean scores for each grade. The table below gives mean scores for each grade.

Means for different Age groups and Grades on Kannada Oral Reading Test

Grades	Mean age in years	Mean scores
II	7.3	22.7
III	8.3	36.9
IV	9.2	43.2
V	10.3	56.4
VI	11.1	65.5
VII	12.0	72.8
VIII	13.1	83.4

Appendix-I(b): Raven's Coloured Progressive Matrices

This test was developed by Raven. The coloured matrices are designed for use with young children and old people, for anthropological studies and for clinical work. They can be

used satisfactorily with people who, for any reason, cannot understand or speak, the regional language, with people suffering from physical disabilities, aphasias, cerebral palsy, or deafness, as well as with people who are intellectually sub-normal or have deteriorated. It has been also found that many dyslexic subjects, both children and adults, have had remarkable success in the Advanced Matrices Test (Raven, 1965). Miller and Wheeler (1974) have considered this test as the most "dyslexia free" of any intelligence test available because it is a test which calls for recognition of abstract relationships, but the amount which the person has to "hold in mind" at once is strictly limited, he must recognize relationship as he scans the patterns horizontally and he must recognize relationships as he scans patterns vertically but he need not scan them both at once and the number of defining properties of the correct design for completing the matrix is well within the limits of the "lead" which he can carry. But, the author has pointed out that it is not a test of "general intelligence" and therefore he has recommended the use of a vocabulary test in conjunction with it.

The three sets A, AB, B each of twelve problems constituting the coloured matrices are arranged to assess the cognitive processes of each children under   11 years of age are usually capable.

The test was administered individually by following instructions given in the manual. The responses were recorded by the investigator and scoring was done as per the instructions given in the manual.

The author has given the following classifications of persons based on the performance on this test:

Grade:

I   "intellectually superior", if his score lies at or above the 95th percentile for people of his age group.

II   "definitely above the average in intellectual capacity", if his score lies at or above the 75th percentile".

III+   if his score is greater than the median or 50th percentile.

III-   if his score is less than the median.

IV+   "definitely below average in intellectual capacity", if his score lies at or below the 25th percentile.

IV-   if his score lies at or below the 10th percentile.

V   "intellectually defective", if his score lies at or below the 5th percentile for his age group".

Instead of following the above classification rigidly, a slight modification was done in the present study. In the study children whose percentile points fell in between 25th and 10th percentiles were also considered as children with average intelligence. This is because some of the good readers included in the study also scored below 25th percentile, indicating thereby though the test is considered as culture faire, some factors might affect the performance of Indian school children on this test. Since the inhibiting factors are not known, a relaxation was made for each children considering them as having average mental ability and all the three groups of children of the study were matched accordingly.

Appendix Ic: Intelligence Scale for Indian Children

The test was developed in line with Binet scale and standardised on Indian population, precisely on the population of Karnataka region by Kamath (1960). The test

assesses intelligence among Kannada speaking population of the age group   2-22

years. It has age scale and to be administered individually.

The raw scores are to be converted into mental age. Both mental age and intelligence

quotient were computed for each child.

Appendix Id: Reading Readiness Test

The test consists of three subtests. They are

Vocabulary

Auditory Discrimination

Visual Discrimination

Vocabulary Test

This test was developed by Devaki in 1978. It measures child's vocabulary and

concept development. The words used as test items are, objects, action pictures and concepts

within the young child's experience. Words were chosen based on the following criteria.

Frequency of Occurrence

The list of 10,000 most frequent Kannada words developed at Deccan College,

Poona, was used to choose the words used on the frequency of occurrence. Out of these

words, 104 words which were 50 per cent to 100 per cent frequency were selected. Out of

these, some of the most frequent words that could be picturised were selected.

Familiarity

Some of the words were chosen from the Kannada Articulation Test developed by

Babu et al. (1973) at All India Institute of Speech Hearing, Mysore. These words were tested

for familiarity and the words were considered as familiar only when   75 per cent of the

children rated them as familiar. Some more words were chosen from the Kannada text books of primary classes.

Thus a total number of sixty eight of the most frequent words were selected and a picture vocabulary test consisting of twenty three items was constructed. Each stimulus item consisted of four words which were picturised. The pictures used were simple line drawings of objects, body parts, actions and concepts.

Description of the Text

Each stimulus card consists of four pictures. In the first part of the test, the children are asked to point out to the word spoken by the teacher and in the second part of the test, they are shown a particular picture and are asked to name it. Thus, both the expressive and receptive vocabulary of the children are tested. These two abilities are tested as good expressive vocabulary and ability to use language are basic to the process of learning to read and by testing receptive vocabulary, are would be testing the children's ability to connect the spoken words with the symbols.

Administration on the Test

The children were tested individually. The test was not a timed. The picture cards were presented to the children. The first item was used as a practice item. The pictures were presented randomly. Whenever the children named the picture correctly or showed the correct picture, they were verbally reinforced. The children were repeatedly instructed to look at the pictures carefully.

Method of Scoring

Each correct response or item was given a score of one and an incorrect item was given zero. Out of the 23 items, scores were obtained only for 22 items, as the first item was used as a practice item.

Auditory Discrimination Test

This test was developed by Kumudavalli in 1973 and restandardised by Devaki in 1978. It measures child's ability to discriminate between pairs of phonemes differing in one or two distinctive features in Kannada language.

The selection of such pairs of distinctive phonemic features depended on

a. Familiarity of the words to young children

b. Picturisability of both the members of the pair.

Thus, pairs of phonemes differing in one or two distinctive features were chosen and a list of 17 minimal pairs was drawn up.

Each word pair forms the stimulus pair which needs to be listened to requiring response in terms of identification of the same words expressed pictorials. Each such word pairs is represented by four pairs of pictures. For any word pair, say for example a-b, the response alternatives in the form of corresponding picture pairs are a-a, a-b and b-b. This arrangement of picture pairs is the same for all the items. The picture pairs of each set are pasted on a sheet of thick paper.

While administering, the subjects are shown all the pictures and asked to name them orally so as to get themselves familiarised with the words that represent them. When the children do not name the pictures, the experimenter tells its name and if the picture is ambiguous, the experimenter explains it.

The children are tested individually. The child is instructed to listen to the word pairs carefully when uttered by the examiner and point out the corresponding picture combinations given on the card. Then the examiner presents each card containing four picture combination and utters the corresponding stimulus word pair. The task should be demonstrated to the children and trials are to be given. After ensuring that the children have understood the instructions, stimulus word pairs are uttered randomly one after the other, each time presenting the child with the corresponding card containing picture combinations for giving the response. Each response is noted down as correct or wrong on a record form. This test also tests the ability of the children to give attention, to follow directions and to examine the pictures carefully. Therefore, the child has to be occasionally reminded to listen carefully and to respond carefully.

Each correct response is given one score of incorrect response zero.

The test was standardized by Devaki (1978) on the same sample including children of age group 3-6.6. The test retest reliability coefficient obtained with a time gap of 10-21 days was 0.89. Thus, the test was found to be highly reliable.

The mean scores and standard deviations for different age groups were calculated and are given below.

**Means and Standard Deviations for different Age groups on
Auditory Discrimination Test (N=100)**

Age group	Mean	SD
3.0 – 4.0	37.17	7.50
4.0 – 5.0	43.26	8.30
5.0 – 6.0	49.23	7.74

6.0 – 6.6	53.18	8.43

Visual Discrimination Test

This test was developed by Devaki in 1978. It measures child's ability to compare different shapes, letters and printed words, and to match them.

The test items were chosen by analysing the Kannada script and selecting the distinctive features of the Kannada alphabet taking into consideration of the features such as shape of the letters, length of the lines and combination of lines and curves. The sets of letters and words chosen were those that could be confused visually such as   . Each letter was compared with every other letter to find out similarities and differences among them. The items used for gross discrimination were those which differed from each other in terms of more features as in the case of distinction between   . The items used for fine discrimination were those which had more features in common and were different from each other only slightly. From the above analysis, major features which seem to be relevant were obtained. All the features that seem to be relevant have been included in this test.

The test was standardised on a sample of 100 children drawn randomly from the school going population of Mysore city. The children selected were in the age range of 3 to 6.6 years studying in Lower Kindergarten, Upper Kindergarten and First standard in seven different schools, in different areas of Mysore city.

All the children were divided on the basis of age into four groups. The interval covered in three of the groups was 12 months and in one group, the interval was six months. The age groups and the number of children in each age group are given below.

Group	Age in years	Number of children
1	3.0 – 4.0	25
2	4.0 – 5.0	30
3	50 – 6.0	30
4	6.0 – 6.6	15

The test includes thirty items. Each stimulus card consists of five to six pictures of different shapes, letters and words. The test is individually administered. During administration the children are asked to point out the two pictures which are similar. Each correct item is given score one and an incorrect one zero.

The test-retest reliability coefficient for the test with a time gap of 10-21 days was found to be 0.90. The mean scores and standard deviations for different age groups obtained for the test are given below.

**Means and Standard Deviations for different Age groups on
Visual Discrimination Test (N=100)**

Age groups	Mean	Standard Deviation
3.0 – 4.0	15.50	4.60
4.0 – 5.0	19.80	4.79
5.0 – 6.0	21.99	3.87
6.0 – 6.6	24.70	2.50

Appendix Ie: Letter Recognition Test

This test was developed by Ramaa (1985) and assesses the accuracy of Kannada letter recognition (grapheme-phoneme correspondence). It is intended to use among dyslexics.

Since this is a letter recognition test in Kannada, there should be representation of Kannada letters in such a way that all the visual and auditory differences are considered. In other words, the list of letters to be written should include all the letters of the alphabet such that all the vowel combinations with one or the other consonant are represented at least once. Apart from this criterion, since it is intended to assess the confusion, if any, between letters with similar visual and auditory, and visual-auditory features while recognising the letters, another criterion is kept in mind while selecting letters. In other words, the representations of letters were made with respect to similarity in visual features, sounds or both among the letters.

Keeping the above criteria in mind 100 symbols including Kannada letters and 'Kagunithas' were listed and were checked by a group of experts for meeting such criteria.

Thus, the final form included 100 symbols. They were arranged in 11 rows of eight letters and three more rows of four letters each.

It is an individually administered untimed test. One score is given for each correct response.

Appendix If: Kannada Word Recognition Test

This test was developed by Ramaa (1985) and assesses the accuracy of Kannada word recognition in grades III and IV.

The test includes 100 words consisting of almost all the letters of Kannada alphabet and sample of 'Kagunitha' (consonant and different sounds including vowels and diphthongs denoted by specific symbols). Each consonant combines with each of the 16 sounds leading

to 16 'Kagunithas' derived from it. The way each such consonant combines with each of the 16 sounds and represented graphically is similar for all the remaining consonants. Since a total of 35 consonants will lead to 35 x 16 'Kagunithas', only a sample of 'Kagunithas' were selected such that all the 16 sounds combinations with one or the other consonant were represented at least once. While writing the words out of the selected letters and 'Kagunithas' double consonant sounds (for example, spa) were avoided such that the average reader of grade III could easily read all the words when sufficient time was given. But, sounds like 'kka, ppa' were included. Since word recognition demands sound blending/word syntheses ability along with identification of letters, the difficulty for word recognition was increased only in terms of number of letters out of which the words were formed. Thus the words formed out of the selected symbols included 2-7 letters. The words were arranged in an increasing order of number of letters in words.

The list of 100 words was given to a few primary school teachers to see whether average readers of grade III could read them without much difficulty. There was almost no modification made and the entire list of 100 words was kept for the final form.

This is an individually administered untimed test. There is no insistence on any particular procedure to be followed while reading the word. The child could perceive the whole word or make use of word attacking skills to recognize word. One score is given for every correct response.

Appendix Ig: Reading Comprehension Test in Kannada

The test was developed by Ramaa (1985) and measures reading comprehension in Kannada among children studying in grades I to IV.

Comprehension in general and reading comprehension in particular can be considered as knowing the lexical meaning and structural meaning of the text. It can also be constructed in terms of different component skills of comprehension. Barrett has listed the following comprehension skills as constituting comprehension:

1.   Literal comprehension: involved identification of ideas and information that are explicitly stated in the selection.

2.   Reorganization: involves analysis, synthesis, and/or organisation of ideas or information explicitly stated in the selection.

3.   Inferential comprehension: involves use of ideas and information explicitly stated in the selection for making conjectures and hypotheses on the basis of one's intuition and personal experiences.

4.   Evaluation: involves evaluative judgement by comparing ideas presented in the selection with external or internal criteria.

5.   Application: involves all the previously cited cognitive dimensions of reading and deals with the psychological and aesthetic impact of the selection on the reader.

This test restricts its scope of assessment of reading comprehension to the following component skills/areas of comprehension-literal, reorganisation and inferential.

A number of passages in Kannada from popular children's literature suited to children studying in grades I through IV were selected. Each passage had all the possible questions pertaining to the literal, reorganization and inferential skills of comprehension. The passages were arranged in an order of difficulty in terms of easy access to recognize the words, knowing the meaning of words in the context, sentence structure and level of comprehension.

It was assumed that as the degree of implicitness increases and if there is scope for more number of inferential comprehension questions the level of comprehension would increase.

The passages were tried out initially on a small sample of children studying in all the grades from I through IV of primary schools. Eight passages were selected on the basis of pre-tryout such that two passages word suited for each of the four grades in terms of easy access to recognize the words, knowing their meaning in the context, sentence structure and the number of questions related to each of the three comprehension skills included in the text.

Final tryout of these passages was done on a representative sample of 120 children selected from three government and two private schools studying in grades I through IV based on the assumption that children attending those schools vary with respect to the educational standard of their parents, assistance provided by the parents to improve their reading performance as well as the type of methodology of teaching to which they are exposed to at schools. These children also satisfied condition related to their performance on Kannada oral reading test (Jai Bai, 1958). Based on the performance on this test, children were classified into different grades on speed and accuracy of word recognition. A child was classified as above average, average or below average if his reading grade was higher than, same as, or lower than the grade in which he was studying respectively. Fifty per cent of the sample from each type of school constituted average readers and the remaining 50 per cent was equally drawn from among above average and below average readers excluding zero grades (reading less than 5 words per minute on Kannada oral reading test). The grade-wise distribution of these 120 children is given below:

Grades	I	II	III	IV

| Number of children | 25 | 25 | 30 | 40 |

Reading comprehension test was administered individually to these children.

Administration Procedure

At the beginning of the test, two passages were given for training purpose, wherein, the examiner helped the child in giving the correct answer. This was thought essential because

1.   It was assumed that children are not generally trained in schools to comprehend the test though self-reading.

2.   It was observed during tryout that some children, especially of grades I and II failed to depend on the passage while giving answers to questions. They were used to give answers erratically.

The training helped them to get idea as to how to search for answers from the passages. The child was asked to read the passage loudly. It was instructed to the examine that he had to read the passage correctly and try to understand while reading so that he could answer the questions asked by the examiner immediately after reading of a particular passage. The test was administered individually. One booklet having the passages was given to the child to read and the examiner kept one for herself to observe how the child read. As the child read the passage, the examiner provided the correct word when the examiner failed to recognise it correctly. But before doing so, the examiner asked the child to observe the word carefully. After the child had read such passage, the questions pertaining to that passage were asked by the examiner one after the other. The expected answer to particular questions varied from one to four sentences in length. The oral responses to questions were

considered as correct if the content was the same as given in the key, irrespective of the sentence structure of the response. When the child failed to respond, the question was repeated once more and proceeded further whether the child responded or not after stating the question for the second time.

The examinee was allowed to look into the passage while answering, because the purpose was not to assess the memory of the content. But the examinee was not allowed to read out sentences directly from the passage as answers to particular questions. When the examinee gave incomplete answer, the examiner sought further information by asking the questions suggested in the key itself. But, the examiner avoided giving hints on the answers. The responses to the questions and the number of errors committed while reading were noted down.

Testing was caused in the following situations:

1.   When the child committed 18 mistakes in any passage, even after allowing him to re-read and the mis-read words, some where in the middle itself. This prevented in becoming the test of reading comprehension a test of oral comprehension. When the child completed the passage committing not more than 18 mistakes, questions pertaining to that passage were asked, but, the child was not permitted to take the next passage. Self corrections, mis-pronunciations and   mis-articulations were not considered as mistakes. The examinee could read by making use of word-attacking skills. When the examinee recognised all the letters individually but failed to form a word out of them, it was considered as an error.

2.   When the examinee failed to answer at least one questions of a particular passage although he committed less than 18 errors during reading. This procedure was based on the

assumption that every passage contained at least one question which could be answered by the children below the grade to which that particular passage was meant.

Usually 45 minutes were required to administer the whole test when the child's speed of reading was on par with grade norms given for word recognition test. When the child was reading slowly, the test was administered in two sittings to avoid fatigue. The child was allowed to read at his own pace.

One score was given for every correctly answered question. Total score was the sum of scores obtained in all the passages.

Percentage of children of all the four grades (I through IV) passed in each question of every passage was calculated separately (difficulty indices). Items for which there was a gradual increase in the frequency of children passed in different grades were selected and the remaining questions were rejected. Thus, the test was made a graded one. The validity of the test was established earlier also at the time of selected of the passage on the basis of pre-tryout and experts opinion. In the final form of the test, the number of questions pertaining to each passage measuring the three areas of comprehension – literal, reorganization and inferential comprehension are as follows:

Passages	Literal comprehension	Reorganisation	Inferential comprehension	Total
I	3	2	0	5
II	2	2	0	4
III	1	3	2	6
IV	1	2	3	6
V	0	2	4	6

VI	0	2	4	6
VII	0	3	6	9
VIII	0	2	6	8
Total	7	18	25	50

The maximum score one can get on this test is 50.

The selected items/questions were rescored and grade norms in the form of arithmetic means were developed on the same sample and are shown in the table below:

Means for Different Grades on Reading Comprehension Test (N=120)

Grades	I	II	III	IV
Mean Score	9	15	24	28

APPENDIX – II

DESCRIPTION OF THE REMEDIAL PROGRAMME

Principles

The following principles were kept in mind while writing the lessons and administering that them to dyslexics.

1.   Dyslexic children need to over-learn information so that it is not forgotten. Therefore, considerable time should be devoted to revision of earlier work.

2.   Since the dyslexic child forgets quickly, new material should be presented frequently and in a number of ways.

- Learning appears to be optimal if one follows the following stages.

  - recognition

  - recall

  - relearning

  - recall

- learned material should be presented in a variety of situations so that the child can generalize his knowledge.

3.   Remedial help should refer to the precise skill to be learned rather than to an assumed gross deficit. Thus, b/d confusions may well be a product of directional confusion, but it is more productive if the child is trained specifically on b/d discriminations, rather than on general direction.

4.   In selecting the child's beginning reading vocabulary, it should be made sure that the words are within the student's range of experience and different with reference to sound and visual configuration.

5.   Learning must be guided, controlled and made explicit in the early stages. This implies that training may be needed to clarify sensory experiences.

6.   Treatment must be consistent and regular.

7.   The child must be actively involved in the learning process, rather than passively assimilating. The child should be allowed to discover the rule if possible and then define it.

8.   The child should be continually busy at a 'meaningful' task during the remedial session. Immediate feedback is essential for the child to evaluate the adequacy of his response. Also, the teacher should either prevent, or immediately correct, spelling errors to ensure continual reinforcement of correct spelling patterns and thus aid assimilation and memory.

9.   Multi-sensory attack should be made using visual, auditory, tactile and kinaesthetic links supported by spoken language and verbalizations.

10.   To enable the child to become motivated the following tactics may be helpful:

- the initial part of the remedial session should involve activities on which the child should achieve success as easily as possible and this may act as a motivator.

- the learning task should be divided into subskills so that the child can master each of them easily and keep himself highly motivated throughout learning the task.

11.   A more therapeutic approach is needed, that means, teaching must inspire the non-reader to take new efforts and increase confidence. The establishment of good teacher-child relationships which encourage cooperation, hopefulness, renewed interest and enthusiasm, and a will to succeed is absolutely essential. The teacher must establish a partnership with the child in teaching.

Main Features

The main features of any remedial reading programme are not only dependent on the objectives of such a programme, the principles that form the basis for it but also on the nature of the script of any language in which the programme is developed. Thus the effectiveness of a remedial programme depends upon the extent to which the distinct features of script of any particular language are identified and made use of in planning the remedial programme. The script of Kannada language like that of most of the other Indian languages is characterised by perfect one to one correspondence. That means, almost all the distinct sounds of Kannada language are represented by distinct symbols. Thus, there are 50 symbols in the alphabet and in addition to that   36 x 16 sets of symbols representing consonant + vowel, consonant + diphthong and other sounds. Apart from this there are other symbols representing consonants. Since there is considerable visual similarity, auditory similarity and auditory-visual similarity among the different symbols of Kannada script, such a symbol system in addition to the number further increases the complexity to master it. It appears more complex to dyslexics compared to normal readers to master it, as they are deficient in visual verbal association. Hence, greater practice is needed for dyslexics to learn all those symbols. One

important advantage of such a symbol system in spite of its complexity to learn is that with a given set of letters it is possible to coin a number of different words so that sufficient practice can be given during teaching to learn them adequately. The main features of the remedial programme, principles underlying them and also the extent to which distinct features of Kannada script are made use of.

The programme that was common for all dyslexics mainly constituted teaching of Kannada alphabet, 'kagunitha' and other accessory forms and to give practice in word analysis and word synthesis, through a number of lessons. These lessons had the following characteristics.

1.   Each lesson had two specific objectives,

        a) providing opportunities to establish association between particular grapheme and phoneme.

2.   Each lesson except the first one introduced only one grapheme at a time and the first lesson had two letters to be learnt.

3.   The order of teaching graphemes does not follow the conventional sequence. Teaching of low frequency letters sometimes follows that of teaching 'kagunitha' and other accessory terms.

4.   Each lesson includes almost all the possible words coined out of the graphemes taught in that lesson, as well as those in previous lessons. The number of words in each lesson may vary from 2 to 25. Thus, there was a provision for cumulative learning and practice.

5.   The lessons were arranged in a particular order, which allowed revision and evaluation of the previous learning as well as practice for the present learning. So, the lessons should be taught in the same sequence.

6.   By learning only one new letter, the child could read many words in every lesson. Thus, the motivation of the child could be maintained at a higher level.

7.   If the child could read the first word or any lesson on his own, it suggested that, that lesson need not be taught through special efforts.

8.   The important feature was that the lessons neither followed alphabetic approach nor whole word approach completely. Since the lesson were cumulative in nature, there was adequate opportunity for the child to practice and learn new letters. The child could make use of his letter knowledge and word synthesis ability in perceiving the new words. There was also scope for practicing certain words, which might be a part of the child's sight vocabulary. The child could make use of his memory for words and word analysing ability in recognizing individual letters. Thus, learning of individual letters and words occurred simultaneously and were mutually complementary. But, here there was no need for every child to learn one particular set of sight vocabulary. There was provision for each child to remember one or more words which he found easier to remember. Thus, through these lessons it could be possible to teach different types of dyslexics who, actually, had to be taught through different approaches.

9.   The lessons were to be taught individually and allowed each child to learn at his own pace.

Planning for Treatment Procedure

After the lessons were written as above, the procedure for making use of them for remedial purposes was also outlined. Both these steps together constituted the planning phase of the treatment procedure. Although the principles that based the lessons were implied in the

actual use of the lessons, the additional learning principles were implied in the approach followed in using the lessons. As mentioned earlier (vide Chapter I), the approach was mainly multisensory. While learning each lesson, the child had to make use of auditory visual and kinaesthetic senses almost simultaneously. While learning each lesson opportunities were provided for listening, seeing, articulating orally and writing each letter.

Lesson No. 1

Specific objectives

- to learn letters 'ma' and 'ra'.

- to learn the synthesis and analysis of the word 'mara' (tree).

- to apply the letter knowledge and word synthesis ability in recognising new words.

Teaching the letter 'ma':

- The letter 'ma' written on a card should be exposed to the child and its name should be told.

- The child should be asked to copy the letter and utter its name simultaneously.

- The child should recognize the letter 'ma' mixed up with other letters, which resemble 'ma' visually, such as 'va', 'ya' and 'pa'. When the child fails in recognizing correct letter should be shown. Whether fails or succeeds in recognizing, the child should point out the differences between all these letters. This would clear visual discrimination and help in remembering the visual feature of the letter 'ma'.

- After learning to recognize, the child should write the letter without looking into the model.

- The child should recognize 'ma' among several other letters and the words also. Thus, practice in recognition and recall would help the child to remember the visual form of the letter. More than that, since the child would recognize and write the letter telling its name simultaneously, grapheme-phoneme association would be established firmly. Thus, the child would see, write and hear a letter and   learn it.

Teaching the Letter 'ra':

The steps to be followed were similar to that of teaching the letter 'ma'.

Teaching the Word 'mara':

The child should be asked to blend the sounds 'ma' and 'ra' presented auditorily. If the child would do it, he could easily perceive the letters written together as 'mara', otherwise training in word synthesis could be given as follows:

- The letters 'ma' and 'ra' written on separate cards had to be kept at a distance of about three inches apart. The child should be asked to name them separately.

- The distance between both the letters had to be gradually reduced and finally had to be kept together and should be asked the child to perceive it as a whole. The visual closure would help in auditory closure also. If the child fails, the tutor should tell the name of the word.

- The cards should be moved away and towards each other for about 3-4 times. Each time the child should tell the names of individual letters and word. The child should tell the sequence of letters in that particular word.

- The child should form the word out of letters written on cards and that were mixed up with other letters.

- The child should recognize the word among other words and should write it out without looking into the card.

- In prior to facilitate word analysis and synthesis simple devices like a card-board with slots to scan words could be male use of. One slot should be wide enough to reveal only one letter at a time whereas the other slot to see the whole word at a time. The appropriate movement of cards having words written on them, through the slot, would help in word analysis and synthesis. Written exercises like the ones below also would aid in learning letters and word analysis and synthesis.

Mara   _____   _____   _____

Ma ra   _____   _____   _____

Mara   _____   _____   _____

     All these steps would help the child to:

- remember the visual feature or letters 'ma', 'ra' and the word 'mara'.

- learn the names of 'ma', 'ra' and 'mara'.

- analyse and synthesize the word 'mara'.

Application of the above learning in the new context:

     This would be made possible by asking the child to recognize the word 'Rama' (name of a girl) which consists of the same letters constituting the word 'mara', but in a different sequence. In order to read this word the child should perceive both the letters individually and then blend them together. Success in this would confirm the achievement of specific objectives of this lesson.

Lesson No. 2

     Specific objectives:

- to learn the letter 'sa'.

- to learn the analysis and synthesis of the word 'sara' (chain).

- to apply the letter knowledge and word synthesis ability in new situation.

The first word of this lesson was 'sara'. The steps to be followed in teaching this lesson were as follows:

The card having this word should be kept in front of the child and should ask the child to name the component letters of the word. As he had already learnt in the previous lesson, he would recognize the letter 'ra'.

The tutor should form the word 'sara' with letters written on cards. The child would recognize the letter 'ra'.

The two letters written on cards should be moved apart and the child should be asked to tell how many letters are there, how many letters he had already learnt. This would motivate the child to learn the letter 'sa'.

The steps to be followed to teach the letter 'sa' and the word 'sara' were same as that of the ones described in the previous lesson. The child would make use of his present and previous learning in recognizing the remaining words of the lesson – 'rasa' (juice), 'sama' (equal), 'samara' (war). Thus, there would be adequate provision for cumulative learning and practice.

Lesson No. 3

Specific objectives:

- to learn the letter 'ga'.

- to learn the analysis and synthesis of the word 'garagasa' {Saw (N)}.

- to apply present and previous learning in new situation.

In the word 'garagasa', the child had already learnt the letters 'ra' and 'sa'. The specific objectives of this lesson could be achieved in the same way that would be followed in the previous lessons. The child would make use of his present and previous learning in recognizing the remaining words of this lesson – 'maga' (son), 'garagasa' and 'garagara' (non-words but describe the sound produced by an object).

The above planning of treatment procedures helped in the implementation of the treatment as uniform as possible for all the cases selected for remediation.