Chapter 6

SUMMARY OF FINDINGS, CONCLUSIONS AND SUGGESTIONS

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SUMMARY OF FINDINGS, CONCLUSIONS AND SUGGESTIONS

In the light of the interpretation of data, conclusions and generalisations are formulated. This final step of research process demands critical and logical thinking in summarising the findings of the study and pairing them with the hypotheses formulated in the beginning. A preliminary analysis of the scores of the special variables was attempted, to answer the research questions posed and tested the hypotheses formulated for the study. This chapter comprises a brief summary of the study, followed by the major findings and conclusions arrived at, implications of the study and the suggestions for further research.

The purpose of the present study is to develop a MMP for minimising the Reading Miscues among the students at upper primary level with Dyslexia. On the basis of the detailed analysis of the Screening Test scores of 425 samples from primary schools, seventy six students were identified as Dyslexics. The Investigator developed a Reading Miscue Inventory (RMI) and a Reading Assessment Test (RAT) as pre-tests. RMI was used to find out the reading errors in the selected sample. Using RAT, the Investigator compared the extent of Dyslexia among the upper primary school students based on their Gender, Locality, Nature of school, Economic status and Type of the family. After developing the Multimedia Package, the effectiveness of the MMP for minimising Reading Miscues viz. Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school students with Dyslexia for the total sample, sub-samples and the various categories within the sub-sample were found out using RMI. Also, its effectiveness for enhancing the reading attainment scores of upper primary school students was found out for the total sample, sub-samples and the various categories within the experimental sample using RAT. Delayed post-test (RAT) results were compared totally and sub-sample wise to find out whether the MMP has any significant effect on the retention capacity of Dyslexic students.
6.1 The Study in Retrospect

The different aspects of the present study are summarised below under the following heads:

Restatement of the problem

DEVELOPMENT OF A MULTIMEDIA PACKAGE FOR STUDENTS AT PRIMARY LEVEL WITH DYSLEXIA.

Objectives of the study

The major objectives of the study are :-

1. To identify and confirm students with Dyslexia at upper primary level from those having Specific Learning Disabilities.

2. To prepare a Reading Miscue Inventory (RMI) to find out the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school students with Dyslexia.

3. To prepare and standardise a Reading Assessment Test (RAT) to find out the extent of reading disability among upper primary school students with Dyslexia.

4. To develop a Multimedia Package for minimising the Reading Miscues and thereby enhancing the reading ability of upper primary school students with Dyslexia.

5. To study the effectiveness of the Multimedia Package in minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school students with Dyslexia.

6. To study the effectiveness of the Multimedia package in minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school
students with Dyslexia for various categories within the sub-samples viz. Boys/ Girls, Urban/ Rural Schools, Aided/Unaided Schools, APL/ BPL Category and Joint / Nuclear family.

7. To compare the effectiveness of the Multimedia package in minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school students with Dyslexia for the sub- samples based on
   a. Gender
   b. Locality
   c. Nature of School
   d. Economic status
   e. Type of family

8. To study the effectiveness of the Multimedia Package for enhancing the reading attainment scores among upper primary school students with Dyslexia.

9. To study the effectiveness of the Multimedia Package for enhancing the reading attainment scores among upper primary school students with Dyslexia for various categories within the sub-samples viz. Boys/ Girls, Urban/ Rural schools, Aided/Unaided Schools, APL/ BPL category, and Joint / Nuclear family.

10. To compare the effectiveness of the Multimedia Package for enhancing the reading attainment scores among upper primary school students with Dyslexia for the sub- samples based on
    a. Gender
    b. Locality
    c. Nature of School
    d. Economic status
    e. Type of family
11. To study the effectiveness of the Multimedia Package in retaining the reading attainment scores among upper primary school students with Dyslexia.

12. To study the effectiveness of the Multimedia Package in retaining the reading attainment scores among upper primary school students with Dyslexia for various categories within the sub-samples viz. Boys/ Girls, Urban/ Rural area, Aided/Unaided Schools, APL/ BPL category, and Joint / Nuclear family.

13. To gather feedback regarding the Multimedia Package from experts using Package Evaluation Proforma.

**Methodology in brief**

Since the objective of the present study is to identify the Dyslexic students among those having specific learning disabilities and to prepare and validate the MMP in English for the upper primary school students with Dyslexia, *Survey cum experimental* method was taken as the method of investigation in which *single group pre-test post-test design* was selected. Through screening test, Students with Specific Learning Disabilities were identified and thereby those having Dyslexia. The Investigator adopted Normative Survey method for this purpose. The identified Dyslexics were trained by means of the Multimedia package designed for minimising their reading errors. Here, the Investigator adopted experimental method.

The population of the present study constitutes 1500 primary school students studying in V\textsuperscript{th} and VI\textsuperscript{th} standards of the English Medium Schools following state syllabus of Kerala. Students were taken from 16 schools of Ernakulam district. For the survey, stratified random sampling technique was adopted by giving due representation to factors like Gender, Locality, Type of schools, Economic status & Nature of schools. Sample obtained for the experimental part was selected from 425 primary school students. They were chosen on the basis of teacher nomination and previous academic performance by analysing the student progress records. Out of 425 upper primary school students
showing low academic performance (grade ‘C’ and below), the Investigator for the purpose of study identified 76 dyslexic samples from those having Specific Learning Disabilities. School progress records were checked to assess the details of students regarding health, family and performance in curricular and extracurricular activities of the experimental group and also to find out whether the selected sample is scholastically backward or not. An intelligence test was also administered to the experimental group to find out their level of intelligence. A checklist was administered last to 50 primary school teachers who are dealing with the sample. Through the above procedures, seventy six Dyslexic students were finally selected for experimentation. Purposive Sampling technique was adopted by the Investigator for the sample selection for experimental method. A Learning Style Inventory was administered to the sample to find out the particular learning style that can be followed by them. A Multimedia Package (MMP) was developed, standardised and validated by the Investigator by giving due weightage to the identified Learning Style. Reading Miscue Inventory (RMI) and Reading Assessment test (RAT) were administered to the experimental group before giving training with the developed MMP. After executing the Multimedia Package, RMI, RAT & Delayed RAT (three months after the administration of the package) were administered to determine the effectiveness and retention ability of the developed Package. Also, a Package Evaluation Proforma is applied to experts to know the application dynamics of the developed Package

**Tools and Materials used in the Study**

The following tools were used for the present study:

1. Student progress record.
2. Screening test
3. Checklist
4. Intelligence test
5. Reading Miscue Inventory (RMI).
6. Reading Assessment Test (RAT)
7. Learning Style Checklist.
10. General Data Sheet.

The data thus collected were tabulated and subjected to analysis using suitable statistical techniques such as computation of percentage, paired ‘t’ test, Analysis of variance (ANOVA), Analysis of Co-variance (ANCOVA), One–way Repeated Measures ANOVA and Pair-wise Multiple Comparison with Sidak Correction.

6.2 Conclusions based on the Findings of the Study

The conclusions that emerged from the results of the analysis of data according to the hypotheses formulated for the study are given under four sections.

Section A: To identify students with Dyslexia at upper primary level from those having Specific Learning Disabilities.

Section B: Effectiveness of the prepared MMP in minimising the Reading Miscues of students at upper primary level with Dyslexia using Reading Miscue Inventory (RMI) for the total sample & the various categories within the sub-samples.

Section C: Effectiveness of the prepared MMP in enhancing the reading attainment scores among the total sample & the various categories within the sub-samples using Reading Assessment Test (RAT).

Section D: Effectiveness of the prepared MMP in retaining the reading attainment scores among the total sample & the various categories within the sub-samples using Reading Assessment Test (RAT).

Section E: The responses of ‘Package Evaluation Proforma for Experts’ to depict the application dynamics of the study.

Section A: To identify students with Dyslexia at upper primary level from those having Specific Learning Disabilities.

The first hypothesis is “A considerable number of upper primary school students having specific learning disabilities show symptoms of Dyslexia”.
It pertains to the analysis of the Screening Test administered on a sample of 425 students studying in 16 schools of Ernakulam district selected (from 1500 Upper primary school students) on the basis of teacher nomination and poor academic background by checking the progress records of students.

The following conclusion is arrived at:

**Conclusion 1**

*Dyslexic students come top in the list of upper primary school students identified with Specific Learning Disabilities, the other categories being Dysgraphia, Dyscalculia, Perception difficulties and Cognitive problems.*

This conclusion is supported by the following findings of the study. Out of 425 samples, 35 students have perceptual problems, 51 exhibits writing difficulties (Dysgraphia), 76 students show reading difficulties (Dyslexia), 46 students have some type of cognitive problems and 62 students shows mathematical problems (Dyscalculia).

**Section B :** *Effectiveness of the prepared MMP in minimising the Reading Miscues of students at upper primary level with Dyslexia using Reading Miscue Inventory (RMI) for the total sample &the various categories within the sub-samples.*

The second hypothesis is “Reading Miscues of Dyslexic students at upper primary level is significantly minimised by the intervention of the Multimedia package”. On the basis of a detailed survey analysis on 1500 upper primary school students studying in sixteen schools of Ernakulam district, the Investigator selected 76 samples having Dyslexia from 425 students (having poor academic background) for implementing the developed and validated MMP. The Investigator administered a Reading Miscue Inventory (RMI) on the samples to find out the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals made in oral reading. The pre-intervention and Post intervention scores obtained through RMI are compared and thus the
effectiveness of MMP was tested. The conclusions that emerge from the results of the analysis of comparison between the pre-intervention and post-intervention scores of RMI according to the hypotheses formulated for the study are

**Conclusion 2**

The MMP is effective in minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school students with Dyslexia.

This is supported by the following findings of the study. The critical ratio obtained for the reading errors are as follows: For omission (m₁=14.2, m₂=7.8; C.R=14.85, p<0.01), addition (m₁=15.8, m₂=8.3; C.R=17.41, p<0.01), reversal(m₁=7.7, m₂=1.8; C.R=11.29, p<0.01), repetition(m₁=7.9, m₂=2.1; C.R=16.12, p<0.01), substitution(m₁=7.9, m₂=2.4; C.R=16.99, p<0.01), mispronunciation(m₁=6.3, m₂=2.0; C.R=16.06, p<0.01) & refusals (m₁=4.5, m₂=1.5; C.R=11.92, p<0.01). All these values are statistically significant. These results substantiated that the MMP is effective for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among the upper primary school students with Dyslexia.

**Conclusion 3**

The MMP is effective in minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among the various categories of upper primary school students with Dyslexia viz. Boys/ Girls, Urban/ Rural Schools, Aided/Unaided Schools, APL/ BPL Category, and Joint / Nuclear family.

The conclusion is arrived at from the following findings of the study.

- The critical ratio obtained for the reading errors of Boys are given: For omission(m₁=14.3, m₂=7.9; C.R=10.25, p<0.01), addition(m₁=15.4, m₂=8.9; C.R=12.9, p<0.01), reversal(m₁=8.2, m₂=1.8; C.R=8.55, p<0.01), repetition(m₁=8.1, m₂=1.9; C.R=12.03, p<0.01), substitution(m₁=7.5, m₂=2.3; C.R=12.81, p<0.01), mispronunciation(m₁=6.4, m₂=2.2; C.R=13.14, p<0.01) & refusals (m₁=4.7, m₂=1.6; C.R=10.26, p<0.01). All these values are
statistically significant. From these results, it can be concluded that the MMP is effective for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals of Boys among the upper primary school students with Dyslexia.

The critical ratio obtained for the reading errors of Girls are as follows: For omission (\(m_1=14, m_2=7.7\): C.R=11.58, \(p<0.01\)), addition (\(m_1=16.3, m_2=7.4\): C.R=12.96, \(p<0.01\)), reversal (\(m_1=6.9, m_2=1.8\): C.R=7.72, \(p<0.01\)) repetition (\(m_1=7.7, m_2=2.2\): C.R=10.97, \(p<0.01\)) substitution (\(m_1=8.5, m_2=2.5\): C.R=11.27, \(p<0.01\)) mispronunciation (\(m_1=6.2, m_2=1.8\): C.R=9.44, \(p<0.01\)) & refusals (\(m_1=4.3, m_2=1.4\): C.R=6.53, \(p<0.01\)). All these values are statistically significant. From these results, it can be concluded that the MMP is effective for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals of Girls among the upper primary school students with Dyslexia.

The critical ratio obtained for the reading errors of students belonging to Urban area are as follows: For omission (\(m_1=14.0, m_2=7.6\): C.R=10.75, \(p<0.01\)), addition (\(m_1=16, m_2=8.2\): C.R=14.14, \(p<0.01\)), reversal (\(m_1=7.6, m_2=1.7\): C.R=7.43, \(p<0.01\)) repetition (\(m_1=8.4, m_2=2.1\): C.R=11.12, \(p<0.01\)) substitution (\(m_1=8.4, m_2=2.5\): C.R=13.33, \(p<0.01\)) mispronunciation (\(m_1=6.4, m_2=2.1\): C.R=12.15, \(p<0.01\)) & refusals (\(m_1=4.5, m_2=1.6\): C.R=9.33, \(p<0.01\)). All these values are statistically significant. From these results, it can be concluded that the MMP is effective for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals of Dyslexic students belonging to Urban area.

The critical ratio obtained for the reading errors of students belonging to Rural area are as follows: For omission (\(m_1=14.3, m_2=8.1\): C.R=10.11, \(p<0.01\)), addition (\(m_1=15.5, m_2=8.4\): C.R=10.71, \(p<0.01\)), reversal (\(m_1=7.7, m_2=1.9\): C.R=8.64, \(p<0.01\)) repetition (\(m_1=7.4, m_2=2.0\): C.R=12.16, \(p<0.01\)) substitution (\(m_1=7.3, m_2=2.3\): C.R=10.88, \(p<0.01\)) mispronunciation (\(m_1=6.3, m_2=2.08\): C.R=10.51, \(p<0.01\)) & refusals (\(m_1=4.5, m_2=1.5\): C.R=7.66, \(p<0.01\)). All these values are statistically significant. From these results, it can be concluded that the MMP is effective for minimising the Reading Miscues such
as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals of Dyslexic students belonging to Rural area.

.subtract\thThe critical ratio obtained for the reading errors of students belonging to Aided Schools are as follows: For omission (m₁=14.3, m₂=8.2:C.R=10.13, p<0.01), addition (m₁=15.8, m₂=8.1:C.R=12.23, p<0.01), reversal (m₁=7.2, m₂=1.7:C.R=8.7, p<0.01) repetition (m₁=7.7,m₂=2.0:C.R=11.77, p<0.01) substitution (m₁=7.6,m₂=2.1: C.R=14.79,p<0.01) mispronunciation (m₁=6.6, m₂=1.9:C.R=14.38,p<0.01) & refusals(m₁=4.5,m₂=1.4:C.R=8,p<0.01). All these values are statistically significant. From these results, it can be concluded that the MMP is effective for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals of Dyslexic students belonging to Aided Schools.

.subtract\thThe critical ratio obtained for the reading errors of students belonging to Unaided Schools are as follows: For omission (m₁=14.0, m₂=7.3:C.R=11.27, p<0.01), addition(m₁=15.7, m₂=8.6:C.R=13.27, p<0.01), reversal(m₁=8.2, m₂=1.9:C.R=7.23,p<0.01)repetition (m₁=8.2, m₂= 2.1:C.R=10.92, p<0.01) substitution (m₁=8.3, m₂=2.8:C.R=9.42, p<0.01) mispronunciation (m₁=5.9, m₂=2.2:C.R=8.63, p<0.01) & refusals (m₁=4.6, m₂=1.7:10.13, p<0.01).All these values are statistically significant. From these results, it can be concluded that the MMP is effective for students coming from Unaided schools for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals.

.subtract\thThe critical ratio obtained for the reading errors of students belonging to APL Category are as follows: For omission (m₁=14.4,m₂=7.8:C.R=12.54, p<0.01), addition(m₁=16.0, m₂=8.4:C.R=15.17, p<0.01), reversal (m₁=7.6, m₂=1.7:C.R=7.94, p<0.01) repetition (m₁=8.1, m₂=2.0:C.R=10.82, p<0.01) substitution (m₁=7.9,m₂=2.4:C.R=12.6,p<0.01) mispronunciation (m₁=6, m₂=2.1:C.R=10.53,p<0.01)& refusals(m₁=4.7,m₂=1.7:C.R=10.21,p<0.01). All these values are statistically significant. From these results, it can be
concluded that the MMP is effective for students belonging to APL category for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunci-tions and Refusals.

The critical ratio obtained for the reading errors of students belonging to **BPL** Category are as follows: For omission \( (m_1=13.9, m_2=7.8; C.R=8.48, p<0.01) \), addition \( (m_1=15.5, m_2=8.1; C.R=9.76, p<0.01) \), reversal \( (m_1=7.7, m_2=1.9; C.R=8.14, p<0.01) \), repetition \( (m_1=7.7, m_2=2.1; C.R=13.37, p<0.01) \), substitution \( (m_1=7.8, m_2=2.4; C.R=11.25, p<0.01) \), mispronunciation \( (m_1=6.7, m_2=2.0; C.R=12.95, p<0.01) \) & refusals \( (m_1=4.3, m_2=1.3; C.R=6.78, p<0.01) \). All these values are statistically significant. From these results, it can be concluded that the MMP is effective for students belonging to BPL category for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunci-tions and Refusals.

The critical ratio obtained for the reading errors of students belonging to **Joint family** are as follows: For omission \( (m_1=14.5, m_2=7.7; C.R=10.39, p<0.01) \), addition \( (m_1=16.2, m_2=8.9; C.R=11.72, p<0.01) \), reversal \( (m_1=7.9, m_2=1.7; C.R=7.0, p<0.01) \), repetition \( (m_1=8.4, m_2=2.0; C.R=9.89, p<0.01) \), substitution \( (m_1=8.5, m_2=2.5; C.R=12.3, p<0.01) \), mispronunciation \( (m_1=6.5, m_2=2.1; C.R=11.32, p<0.01) \) & refusals \( (m_1=4.5, m_2=1.8; C.R=8.09, p<0.01) \). All these values are statistically significant. Hence the MMP is effective for students belonging to Joint family for minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunci-tions and Refusals.

The critical ratio obtained for the reading errors of students belonging to **Nuclear family** are as follows: For omission \( (m_1=13.9, m_2=7.9; C.R=10.6, p<0.01) \), addition \( (m_1=15.4, m_2=7.8; C.R=12.75, p<0.01) \), reversal \( (m_1=7.5, m_2=1.9; C.R=9.08, p<0.01) \), repetition \( (m_1=7.5, m_2=2.1; C.R=13.64, p<0.01) \), substitution \( (m_1=7.4, m_2=2.3; C.R=11.91, p<0.01) \), mispronunciation \( (m_1=6.2, m_2=1.9; C.R=11.34, p<0.01) \) & refusals \( (m_1=4.5, m_2=1.3; C.R=8.85, p<0.01) \). All these values are statistically significant. Hence the MMP is effective for students belonging to Nuclear family for minimising the Reading Miscues...
such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals.

**Conclusion 4**

The effectiveness of the MMP in minimising the errors such as Omissions, Substitutions, Reversals, Repetitions and Refusals among upper primary school students with Dyslexia is independent of Gender, Locality, Nature of School, Economic Status and Type of Family.

The conclusion is arrived at from the following findings of the study.

- The Analysis of Covariance of pre-test and post-test scores regarding **Omission of sound/word**, $F_{y.x}$ for the subsamples - Gender, Locality, Nature of School, Economic Status and Type of Family are 0.03; $p>0.05$, 0.62; $p>0.05$, 2.09; $p>0.05$, 0.04; $p>0.05$, & 0.82; $p>0.05$, respectively which are not significant even at 0.05 level. Also the ‘t’ value for all the sub-samples based on Gender, Locality, Nature of School, Economic Status and Type of Family obtained (0.16; $p>0.05$, 0.79; $p>0.05$, 1.45; $p>0.05$, 0.21; $p>0.05$, & 0.91; $p>0.05$ respectively) also indicated that there exist no significant differences between the various sub-samples with respect to Omission of sound/word. Thus it can be concluded that the effectiveness of the MMP for students at upper primary level with Dyslexia is independent of Gender, Locality, Nature of School, Economic Status and Type of Family in reducing their Omission errors.

- The Analysis of Covariance of pre-test and post-test scores concerning **Reversal of sound**, $F_{y.x}$ for the sub-samples Gender, Locality, Nature of School, Economic Status and Type of Family are 0.07; $p>0.05$, 0.18; $p>0.05$, 0; $p>0.05$, 0.16; $p>0.05$, & 0.52; $p>0.05$ respectively which are not significant even at 0.05 level. Also the ‘t’ value for all the sub-samples based on Gender, Locality, Nature of School, Economic Status and Type of Family obtained (0.27; $p>0.05$, 0.43; $p>0.05$, 0.06; $p>0.05$, 0.4; $p>0.05$, & 0.72; $p>0.05$ respectively) also indicated that there exist no significant differences between the various sub-samples with respect to Reversal error. Hence the
effectiveness of the MMP for students at upper primary level with Dyslexia is independent of Gender, Locality, Nature of School, Economic Status and Type of Family in reducing the error ‘Reversal of sound’.

The Analysis of Covariance of pre-test and post-test scores regarding Repetition of sound/word, \( F_{y,x} \) for the sub-samples Gender, Locality, Nature of School, Economic Status and Type of Family are 1.08; \( p>0.05 \), 0.05; \( p>0.05 \), 0; \( p>0.05 \), 0.21; \( p>0.05 \), & 0.23; \( p>0.05 \) respectively which are not significant even at 0.05 level. Also the ‘t’ value for all the sub-samples based on Gender, Locality, Nature of School, Economic Status and Type of Family obtained (1.04; \( p>0.05 \), 0.23; \( p>0.05 \), 0.05; \( p>0.05 \), 0.46; \( p>0.05 \), & 0.48; \( p>0.05 \) respectively) also indicated that there exist no significant differences between the various sub-samples with respect to Repetition error. So it can be concluded that the effectiveness of the MMP for students at upper primary level with Dyslexia is independent of Gender, Locality, Nature of School, Economic Status and Type of Family in reducing the error ‘Repetition of sound/word’.

The value of ANCOVA concerning Substitution of sound, \( F_{y,x} \) for the sub-samples Gender, Locality, Nature of School, Economic Status and Type of Family are 0.02; \( p>0.05 \), 0.1; \( p>0.05 \), 2.67; \( p>0.05 \), 0.01; \( p>0.05 \) & 0; \( p>0.05 \) respectively which are not significant even at 0.05 level. Also the ‘t’ value for all the sub-samples based on Gender, Locality, Nature of School, Economic Status and Type of Family Obtained (0.13; \( p>0.05 \), 0.33; \( p>0.05 \), 1.64; \( p>0.05 \), 0.08; \( p>0.05 \) & 0 ; \( p>0.05 \), respectively) indicated that there exist no significant differences between the various sub-samples with respect to Substitution error. Hence the effectiveness of the MMP for students at upper primary level with Dyslexia is independent of Gender, Locality, Nature of School, Economic Status and Type of Family in reducing the error ‘Substitution of sound’.

The Analysis of Covariance of pre-test and post-test scores regarding Refusal of words, \( F_{y,x} \) for the sub-samples Gender, Locality, Nature of School, Economic Status and Type of Family are 0.38; \( p>0.05 \), 0.21; \( p>0.05 \),
The ‘t’ value for all the sub-samples based on Gender, Locality, Nature Of School, Economic Status and Type of Family Obtained (0.62; p>0.05, 0.46; p>0.05, 0.79; p>0.05, 1.09; p>0.05, & 1.92; p>0.05 respectively) indicated that there exist no significant differences between the various sub-samples with respect to Refusal of words. Hence it can be concluded that the effectiveness of the MMP for students at upper primary level with Dyslexia is independent of Gender, Locality, Nature of School, Economic Status and Type of Family in reducing the Refusal of words.

**Conclusion 5**

*The MMP is significantly more effective in minimising the Addition errors made by Girls when compared to Boys.*

This conclusion is supported by the following finding.

The Analysis of Covariance of pre-test and post-test scores regarding **Addition of sound/word**, \(F_{y,x} = 11.9; p< 0.01\) is significant for the sub-sample Gender at 0.05 level. The significant F value necessitated the procedure for proceeding to check the significance of the sub-sample gender separately using ‘t’ test, which showed a value of 3.47; p<0.01, Of the two groups, Girls showed lesser scores on RMI (m₁=7.2) when compared to Boys (m₂=9.1) which suggested that the MMP is significantly more effective for **Girls** than Boys in reducing the error ‘Addition of sound/word.’

**Conclusion 6**

*The effectiveness of the MMP in minimising the Addition errors of upper primary school students with Dyslexia is independent of Locality, Nature of school, Economic status and Type of family.*

This conclusion is deducted from the following finding.
The value of ANCOVA concerning addition errors \((F_{y,x})\) for the sub-samples Locality, Nature of School, Economic Status and Type of Family are 0.47; \(p>0.05\), 0.98; \(p>0.05\), 0.02; \(p>0.05\) & 1.31; \(p>0.05\) respectively which are not significant even at 0.05 level. Also the ‘t’ value for all the sub-samples based on Locality, Nature Of School, Economic Status and Type of Family obtained 0.68; \(p>0.05\), 0.99; \(p>0.05\), 0.13; \(p>0.05\), &1.15; \(p>0.05\) respectively also indicated that there exist no significant differences between the various sub-samples with respect to Addition of sound/word. From these analyses, it can be concluded that the effectiveness of the MMP for students at primary level with Dyslexia is independent of Locality, Nature of School, Economic Status and Type of Family in reducing their Addition errors.

**Conclusion 7**

The MMP is significantly more effective in reducing the Mispronunciations made by students belonging to Aided Schools than those from Unaided Schools.

The conclusion is obtained from the finding given below.

The Analysis of Covariance of pre-test and post-test scores regarding Mispronunciation of vowel/consonant, \(F_{y,x}\) value (4.32) for the sub-sample Nature of School is significant at 0.05 level. The significant F value necessitated the procedure for proceeding to check the significance of the sub-sample, Nature of school separately using ‘t’ test, which showed a value of 2.1. Of the two groups, Aided school students showed lesser scores on RMI \((m_1=1.8)\) when compared to Unaided school students \((m_2=2.3)\) which suggested that the MMP is significantly more effective for Aided school students than Unaided school students in reducing the error ‘Mispronunciation of vowel/consonant’.

**Conclusion 8**

The effectiveness of the MMP in minimising the Mispronunciations among upper primary school students with Dyslexia is independent of Gender, Locality, Economic status and Type of family.
The conclusion is deduced from the following finding.

The Analysis of Covariance of pre-test and post-test scores regarding Mispronunciation of vowel/consonant, $F_{y,x}$ for the sub-samples Gender, Locality, Economic Status and Type of Family are 1.26; $p>0.05$, 0.08; $p>0.05$, 1.05; $p>0.05$ & 0.09; $p>0.05$, respectively which are not significant even at 0.05 level). Also the ‘t’ value for all the sub-samples based on Gender, Locality, Economic Status and Type of Family obtained (1.12; $p>0.05$, 0.28; $p>0.05$, 1.04; $p>0.05$ & 0.31; $p>0.05$ respectively) also indicated that there exist no significant differences between the various sub-samples with respect to Mispronunciation of Vowel/Consonant. From these analyses, it can be concluded that the effectiveness of the MMP for students at upper primary level with dyslexia is independent of Gender, Locality, Economic Status and Type of Family in reducing the Mispronunciation of Vowel/Consonant.

Section C: Effectiveness of the prepared MMP in enhancing the reading attainment scores among the total sample & the various categories within the sub-samples using Reading Assessment Test (RAT).

The third hypothesis is “The reading attainment scores of Dyslexic students at upper primary level is enhanced by the intervention of the MultimediaPackage”.

The conclusions that emerge from the results of the analysis of comparison between the pre-test, post-test & delayed post-test scores of RAT are as follows.

Conclusion 9

The MMP is effective in enhancing the reading attainment scores among upper primary school students with Dyslexia.

This is supported by the following finding of the study.

The mean test scores of students at upper primary level at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 38.2, 73.9 and 72.9
respectively. One way repeated measures ANOVA result \( F = 135434 \) shows that the variation in scores at different intervals of time is significant at 0.01 level. This shows that the MMP is effective and is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of students at upper primary level with Dyslexia.

**Conclusion 10**

The MMP is effective in enhancing the reading attainment scores among upper primary school students with Dyslexia for the various categories within the sub-samples viz. Boys/ Girls, Urban/ Rural schools, Aided/Unaided Schools, APL/ BPL category and Joint / Nuclear family.

This conclusion is deducted from the following findings.

- The mean test scores of **Boys** at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 36.5, 72.6 & 71.8 respectively. One way repeated measures ANOVA result \( F = 8777.24 \) shows that the variation in scores at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among Boys. The mean difference between pre-test and post-test assessment is 36.0, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of Boys at upper primary level with Dyslexia.

- The mean scores of **Girls** at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 40.6, 75.9 & 74.5 respectively. One way repeated measures ANOVA result \( F = 5285.28 \) shows that the variation in scores at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among Girls. The mean difference between pre-test and post-test assessment is 35.2, the pair-wise comparison with Sidak correction shows that the difference is statistically
significant at 0.05 level. The result shows that the MMP significantly enhanced the reading attainment scores of Girls among the students at upper primary level with Dyslexia.

- The mean scores of **Urban** students at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 37.6, 73.6 & 72.8 respectively. One way repeated measures ANOVA result (F = 10576.93) shows that the variation in scores at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among the Urban students. The mean difference between pre-test and post-test assessment is 36.0, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of Urban students at primary level with Dyslexia.

- The mean scores of **Rural** students at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 38.8, 74.2 & 73.0 respectively. One way repeated measures ANOVA result (F = 4884.31) shows that the variation in score at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among the Rural students. The mean difference between pre-test and post-test assessment is 35.4, the pair-wise comparison with Sidak Correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of Rural students at upper primary level with Dyslexia.

- The mean test scores of **Aided School** students at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 38.7, 74.3 & 73.1 respectively. One way repeated measures ANOVA result (F = 6613.7) shows that the variation in score at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of
Dyslexia among the Aided school students. The mean difference between pre-test and post-test assessment is 35.6, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of Aided School students at primary level with Dyslexia.

The mean test scores of Unaided School students at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 37.5, 73.4 & 72.7 respectively. One way repeated measures ANOVA result (F = 7674.439) shows that the variation in score at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among the Unaided School students. The mean difference between pre-test and post-test assessment is 35.9, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of Unaided School students at primary level with Dyslexia.

The mean test scores of Students belonging to APL category at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 37.8, 73.6 & 72.8 respectively. One way repeated measures ANOVA result (F = 9897.231) shows that the variation in score at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among the upper primary school students from APL category. The mean difference between pre-test and post-test assessment is 35.9, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of APL students at upper primary level with Dyslexia.

The mean test scores of Students belonging to BPL category at different stages such as before the implementation of MMP after the implementation of the programme and at a delayed stage (i.e. after three months) are 38.8, 74.3
&73.1 respectively. One way repeated measures ANOVA result (F = 4498.62) shows that the variation in score at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among the BPL students. The mean difference between pre-test and post-test assessment is 35.5, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of BPL students at upper primary level with Dyslexia.

The mean test scores of upper primary school students coming from the Joint family at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 37.4, 73.4 & 73.1 respectively. One way repeated measures ANOVA result (F = 9086.404) shows that the variation in score at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among the upper primary school students coming from the joint family. The mean difference between pre-test and post-test assessment is 35.9, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The result shows that the MMP significantly increased the reading attainment scores of upper primary school students coming from the Joint family.

The mean test scores of upper primary school students coming from the Nuclear family at different stages such as before the implementation of MMP, after the implementation of the programme and at a delayed stage (i.e. after three months) are 38.9, 74.4 & 73.0 respectively. One way repeated measures ANOVA result (F = 6065.84) shows that the variation in score at different intervals of time is significant at 0.01 level. This shows that the MMP is effective for minimising the symptoms of Dyslexia among the upper primary school students coming from the Nuclear Family. The mean difference between pre-test and post-test assessment is 35.5, the pair-wise comparison with Sidak correction shows that the difference is statistically significant at 0.05 level. The
result shows that the MMP significantly increased the reading attainment scores of upper primary school students coming from the Nuclear family.

Conclusion 11

The MMP is equally effective for enhancing the reading attainment scores of the various sub-samples of upper primary school students with Dyslexia viz. Gender, Locality, Nature of school, Economic Status and Type of family.

This conclusion is deduced from the following findings.

- The Analysis of Covariance of pre- and post-test scores of Boys and Girls showed that there was no significant difference between the means of the post-test scores of the two groups ($F_{y,x} = 0.48; p>0.05$). The adjusted means of the post-test scores of Boys & Girls students were 74.0 and 73.7 respectively. The t-value obtained ($t=0.79; p>0.05$) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of Boys and Girls.

- The Analysis of Covariance of pre- and post-test scores of Urban & Rural students showed that there was no significant difference between the means of the post-test scores of the two groups ($F_{y,x} = 0.92; p>0.05$). The adjusted means of the post-test scores of Urban & Rural Students were 74.1 and 73.7 respectively. The t-value obtained ($t=0.97; p>0.05$) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of Urban & Rural Students.

- The Analysis of Covariance of pre- and post-test scores of Aided & Unaided School students showed that there was no significant difference between the means of the post-test scores of the two groups ($F_{y,x} = 0.14; p>0.05$). The adjusted means of the post-test scores of Aided & Unaided School students were 73.8 and 74.0 respectively. The t-value obtained ($t=0.37; p>0.05$) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of Aided & Unaided School students.
The Analysis of Covariance of pre- and post-test scores of students belonging to **APL & BPL** category showed that there was no significant difference between the means of the post-test scores of the two groups \( (F_{y,x} = 0.14; \ p>0.05) \). The adjusted means of the post-test scores of students belonging to APL & BPL category were 73.8 and 74.0, respectively. The t-value obtained \( (t=0.37; \ p>0.05) \) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of students belonging to APL & BPL category.

The Analysis of Covariance of pre- and post-test scores of students belonging to **Joint & Nuclear family** showed that there was no significant difference between the means of the post-test scores of the two groups \( (F_{y,x}=0.43; \ p>0.05) \). The adjusted means of the post-test scores of students belonging to Joint & Nuclear family were 74.0 and 73.8, respectively. The t-value obtained \( (t=0.66; \ p>0.05) \) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of students belonging to Joint & Nuclear family.

**Conclusion 12**

**The MMP is equally effective for enhancing the reading attainment scores of the various sub-samples of upper primary school students with Dyslexia viz. Gender, Locality, Nature of school, Economic Status and Type of family.**

This conclusion is deducted from the following findings.

- The Analysis of Covariance of pre- and post-test scores of **Boys and Girls** showed that there was no significant difference between the means of the post-test scores of the two groups \( (F_{y,x} = 0.48; \ p>0.05) \). The adjusted means of the post-test scores of Boys & Girls students were 74.0 and 73.7, respectively. The t-value obtained \( (t=0.79; \ p>0.05) \) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of Boys and Girls.
The Analysis of Covariance of pre- and post-test scores of **Urban & Rural** students showed that there was no significant difference between the means of the post-test scores of the two groups \(F_{y,x} = 0.92; p>0.05\). The adjusted means of the post-test scores of Urban & Rural Students were 74.1 and 73.7 respectively. The t-value obtained \((t=0.97; p>0.05)\) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of Urban & Rural Students.

The Analysis of Covariance of pre- and post-test scores of **Aided & Unaided** School students showed that there was no significant difference between the means of the post-test scores of the two groups \(F_{y,x} = 0.14; p>0.05\). The adjusted means of the post-test scores of Aided & Unaided School students were 73.8 and 74.0 respectively. The t-value obtained \((t=0.37; p>0.05)\) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of Aided & Unaided School students.

The Analysis of Covariance of pre- and post-test scores of students belonging to **APL & BPL category** showed that there was no significant difference between the means of the post-test scores of the two groups \(F_{y,x} = 0.14; p>0.05\). The adjusted means of the post-test scores of students belonging to APL & BPL category were 73.8 and 74.0 respectively. The t-value obtained \((t=0.37; p>0.05)\) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of students belonging to APL & BPL category.

The Analysis of Covariance of pre- and post-test scores of students belonging to Joint & Nuclear family showed that there was no significant difference between the means of the post-test scores of the two groups \(F_{y,x} = 0.43; p>0.05\). The adjusted means of the post-test scores of students belonging to Joint & Nuclear family were 74.0 and 73.8 respectively. The t-value obtained \((t=0.66; p>0.05)\) was not significant at 0.05 level. Hence the MMP is equally effective for enhancing reading attainment scores of students belonging to Joint & Nuclear family.
**Section D:**  *Effectiveness of the prepared MMP in retaining the reading attainment scores among the total sample & the various categories within the sub-samples using Reading Assessment Test (RAT).*

The fourth hypothesis is “The reading attainment scores of Dyslexic students at upper primary level is retained by the intervention of the Multimedia Package”.

The conclusions that emerge from the results of the analysis of comparison between the pre-test, post-test & delayed post-test scores of RAT are as follows.

**Conclusion 13**

The Retention capacity of upper primary school students identified with Dyslexia is enhanced significantly after the intervention of the MMP.

This conclusion is deducted from the following findings.

The mean difference between pre-test and delayed post-test score i.e., 34.7; p<0.05, which is significant at 0.05 level. It means that the post-test scores even at delayed stage is statistically significant and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores. Also, the mean difference in scores between post-test and delayed post-test is 1.0 which is not significant at 0.05 level. It means that the level of forgetting is not significant under the administration of the MMP after a period of interval. The results thus show that the MMP is effective for students at upper primary level with Dyslexia for a period of time.

**Conclusion 14**

The Retention capacity of upper primary school students with Dyslexia is enhanced significantly after the intervention of the MMP for the various categories within the sub-samples viz. Boys/ Girls, Urban/ Rural schools, Aided/Unaided Schools, APL/ BPL category and Joint / Nuclear family.
The mean difference between pre-test and delayed post-test score of **Boys** is 35.2, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores. Also, the mean difference in scores between post test and delayed post-test is 0.8 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for Boys among the students at upper primary level with Dyslexia for a period of time.

The mean difference between pre-test and delayed post-test score of **Girls** is 33.9, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores. Also, the mean difference in scores between post test and delayed post-test is 1.3 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for Girls among the students at upper primary level with Dyslexia for a period of time.

The mean difference between pre-test and delayed post-test score of **Urban School** students is 35.2, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores. Also, the mean difference in scores between post test and delayed post-test is 7.7 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for Urban students at upper primary level with Dyslexia for a period of time.

The mean difference between pre-test and delayed post-test score of **Rural School** students is 34.2, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability
of scores among Rural students. Also, the mean difference in scores between post test and delayed post-test is 1.2 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for Rural students at upper primary level with Dyslexia for a period of time.

- The mean difference between pre-test and delayed post-test score of Aided School students is 34.4, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores among Aided School students. Also, the mean difference in scores between post test and delayed post-test is 12 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for Aided School students at upper primary level with Dyslexia for a period of time.

- The mean difference between pre-test and delayed post-test score of Unaided School students is 35.2, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores among Unaided School students. Also, the mean difference in scores between post test and delayed post-test is 0.7 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for Unaided School students at upper primary level with Dyslexia for a period of time.

- The mean difference between pre-test and delayed post-test score of students belonging to APL category is 35.0, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores among the APL students. Also, the mean
difference in scores between post test and delayed post-test is 0.9 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for APL students at upper primary level with Dyslexia for a period of time.

- The mean difference between pre-test and delayed post-test score of students belonging to BPL category is 34.3, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores among BPL students. Also, the mean difference in scores between post test and delayed post-test is 1.2 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for BPL students at upper primary level with Dyslexia for a period of time.

- The mean difference between pre-test and delayed post-test score of students coming from the Joint family is 35.4 which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores among primary school students coming from the joint family. Also, the mean difference in scores between post test and delayed post-test is 0.6 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for upper primary school students coming from the Joint family for a period of time.

- The mean difference between pre-test and delayed post-test score of students coming from the Nuclear family for a period of time is 34.2, which is significant at 0.05 level. It means that the scores even at delayed stage is statistically significant, and hence the level of forgetting is minimal after the intervention. This also shows the sustainability of scores among primary
school students coming from the nuclear family. Also, the mean difference in scores between post test and delayed post-test is 1.3 which is not significant at 0.05 level. It means that the level of forgetting is not significant after a fixed interval of time under the administration of the MMP. The results thus show that the MMP is effective for upper primary school students coming from the Nuclear family for a period of time.

Section E : The Responses of Package Evaluation Proforma for experts to reveal the application dynamics of the study.

Conclusion 15

The MMP is structurally and practically valid and effective for enhancing the reading attainment scores of Dyslexic students

This conclusion is arrived at from the following findings of the study based on the responses from Package Evaluation Proforma to experts.

• Majority of the experts have a feeling that the MMP is matching with the present curriculum/syllabus of the primary classes.
• Majority of the experts agreed that the learning activities in the MMP meet the objectives of the study.
• Great Majority of the experts agreed that there is provision for meaningful learner participation.
• Great Majority of the experts suggested that the MMP is appealing to the concerned age group students.
• Great Majority of the experts have an opinion that the MMP helps in increasing the motivation/interest level of the learner
• Majority of the experts proposed that the production quality of the MMP in terms of colour, sound, legibility, continuity etc is acceptable.
• Great Majority of the experts are satisfied with the sequence in which the different phases in this Package are arranged.
• Great Majority of the experts agreed that the learning activities in the MMP lead to beneficial follow up activities/assignments
• Majority of the experts opined that the medium used in the MMP is appropriate in terms of delivery of content.

• Great Majority of the experts suggested that the content in this Package is suitable in terms of depth, treatment, accuracy and being up-to-date.

• Majority of the experts proposed that the content in this Package are easy for the students to understand the concepts and effective for the teachers, who handle the Package.

• Great Majority of the experts opined that the design and animation of the MMP aids learning.

• Great Majority of the experts have the opinion that the training activities suggested in the Package are effective for the primary class-students.

• Great Majority of the experts suggested that the symptoms of Dyslexia can be minimised by using the MMP.

• Great Majority of the experts recommend that the MMP can be recommended for the general application as part of the formal education.

6.3 Tenability of the Hypotheses

The first hypothesis states that “A considerable number of upper primary school students having Specific Learning Disabilities show symptoms of Dyslexia”.

The findings of the study substantiate this hypothesis. The results of the study indicate that Dyslexic students top the list of upper primary school students identified with Specific Learning Disabilities.

The second hypothesis is The second hypothesis is “Reading Miscues of Dyslexic students at upper primary level is significantly minimised by the intervention of the Multimedia package”.

The major findings of the study state that the MMP is effective in minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary
school students with Dyslexia for the total sample and the various categories within the sub-samples viz. Boys/ Girls, Urban/ Rural Schools, Aided/Unaided Schools, APL/ BPL Category and Joint / Nuclear Family. The second hypothesis is accepted.

The third hypothesis is “The reading attainment scores of Dyslexic students at upper primary level is enhanced by the intervention of the MultimediaPackage”.

The major findings of the study state that the MMP is effective in enhancing the reading attainment scores of upper primary school students with Dyslexia for the total sample and the various categories within the sub-samples viz. Boys, Girls, Urban, Rural, APL, BPL, Joint and Nuclear Family. The third hypothesis is thus accepted.

The fourth hypothesis is “The reading attainment scores of Dyslexic students at upper primary level is retained by the intervention of the MultimediaPackage”

The major findings of the study state that the MMP is effective in retaining the reading attainment scores of upper primary school students with Dyslexia for the total sample & the various categories within the sub-samples viz. Boys, Girls, Urban, Rural, APL, BPL, Joint and Nuclear Family. The fourth hypothesis is thus accepted.

6.4 Educational Implications of the Study

The main objective of the study was to develop a Multimedia Package for upper primary school students for enhancing their reading attainment scores and to test the effectiveness of the Package. The major findings of the study and the conclusion drawn from the findings helped the Investigator to suggest certain educational implications which may be helpful to improve the Reading Skills of children having Specific Learning Disabilities at upper primary level. The implications are outlined below.
• Effective use of the remedial MMP help the children to improve academically which in turn helps to develop self esteem, achievement, motivation and acceptance among peers. MMP provides students ample opportunities to plan and practice monitoring of their learning. The combination of Multimedia elements such as texts, graphics, animations, audios and videos in one digital environment created an interesting and interactive learning environment. The student’s perception and attention span also gets improved by utilising the Multimedia presentation.

• The Package has provision to understand students, their own learning process. This understanding helps to improve the self efficacy of students and to regulate their learning process in a positive direction. The Package helps the learners to reduce their academic anxiety to a great extent. The self-evaluation aspect provided in the Package helped students to know whether the desired goal has attained.

• According to this study, best results are obtained only when individual activities are given. The MMP has contributed to increase the retention capacity of students, which is worth mentioning. They would be able to retain the matter for a much longer period of time. Thus reading as well as retention is enhanced by MMP.

• From the efficacy of the remedial MMP on errors made by Dyslexic students, it is evident that remediation carried out within the framework of the normal daily routine of the school is feasible, beneficial, practical and helps in preventing errors in reading, which in turn help in reducing the dropout rate in schools.

• Proficient reading is necessary for success in all levels of education and in almost every profession. This implies clear comprehension of the communication presented in print. The present study shows that there are congenital neurological problems like Dyslexia which causes difficulty in reading in many children. If such problems are persistently seen in children, diagnosis and remediation should be done with the help of medical experts,
in co-operation with the parents concerned. Since the achievement of pupil in any subject depend on his skills in reading, provisions should be made to test the reading comprehension ability of each pupil, together with other examinations.

• The important findings of the study are broadly indicative of some of the drawbacks which exist in the area of education in Aided and Unaided schools. A considerable number of children in these schools have some type of learning difficulties. They need special assistance and professional help. The scientific implementation of special education services is inevitable in these schools, especially Unaided ones. Though there are inclusive education programmes, students with Specific Learning Disability get little attention. The important reason for this condition is lack of professionals and assessment devices. So teachers should prepare Diagnostic tests for identifying specific reading and writing difficulties of the students. Enough training should be given to the Language teachers to handle Dyslexic students in classroom.

• Pre-school diagnosis for the identification of learning difficulties must be carefully planned. It must be systematic and ongoing process. The teacher must know what he/she is evaluating and how to interpret the results. No doubt it requires investing time and energy, but the long-term results are worth. The teacher needs to be familiar with the reading and writing process so that he/she knows what areas of skills are to assess and diagnose the difficulties accordingly. Checklists and record forms can be used during classroom observations. They may also refer to handbooks on children and learning difficulties.

• A major drawback in the Indian educational system is that after diagnosing a child as being learning disabled, little attempt is made to make sure that he/she receives appropriate help. School should be well equipped to implement latest technologies useful for students having learning disabilities. For this, resource room can be arranged and more teaching aids should be provided. This will help teachers to give special attention to such children.
Also the libraries of the schools should be equipped with necessary literature to facilitate fostering of reading skills.

- Model MMPs should be developed by expert teams and made available to the teachers for their classroom use. The study also throws light on the fact that, in order to incorporate technology fully into the classroom, the teachers must be provided with time an support to explore technology of their own. The teachers should also get the opportunity to attend the workshops, seminars, refresher courses etc. to equip them to prepare remedial Multimedia Learning Packages.

- Teachers should employ novel and interesting instructional strategies, which will provide a multitude of opportunities to choose suitable activities for reading. This is the hallmark of effective teaching. They should lead students towards deep reading in a delightful manner. This will result in excellent performance, retention and reflective thinking of the students.

- The teachers must be encouraged to use educational materials such as Multimedia Packages for the development of reading skills of students. They should be familiarised with the modern innovations and methods of improving reading skills of children. A structural plan of action is very beneficial to both the teacher and the learner. Though it seems like a lot of hard work initially, in the long run it saves teaching time, and is far more productive. Hence the use of this type of learning packages should be incorporated in the syllabi for teacher training and in-service training programmes.

- The school and home have vital responsibility in the enhancement of reading ability of children. There should be provision for contact of members of these two agencies. So appropriate programmes may be arranged by schools to enrich the parents about learning disabilities. Family members must be given awareness about their childrens’ particular disability so as to help their child to improve personality development. Also, there is an urgent need for
conducting parental counselling to deal with and give enough emotional support to children having Dyslexia.

- Examination system must be revised so that Learning Disabled children can perform well.

- Keeping the result of study in mind, appropriate steps should be taken by NCERT, SCERT and other agencies related to quality of education regarding the development of Multimedia Learning Packages for improving Reading Skills.

### 6.5 Suggestions for Further Research

From the experience of the present study, it is hoped that the study would open doors to researchers for further studies in the area of methods of improving Reading Skills of the Dyslexic students. The Investigator feels that there are still areas left where future research work can be done.

- Multimedia Learning Packages can be prepared for students at lower primary and secondary level to know its effectiveness.

- This study can be extended to other areas of Specific Learning Disability such as Dysgraphia, Dysphasia And Dyscalculia.

- Exposure to Multimedia can be given to the pupils for longer duration.

- The effectiveness of Language Experience Approach as remedial teaching for Dyslexic children can be investigated.

- Comparative effects of modern reading programmes as remedial teaching for Dyslexic students viz. Basal Reader Approach, Individualised Reading Programme and Language Experience Approach can be an area of research in primary level.

- Home related factors like parental encouragement, socio-economic status of the family, availability of reading materials at home, facilities to read at home etc can be combined with all or anyone of the modern approaches as remedial teaching for Dyslexic students can be a topic of research.
• Pupil related factors like intelligence and personality of Dyslexic students, their attitude towards reading and interest in reading can be correlated with their achievement in reading not only in English, but also mother tongue too.

• Similar Packages can be prepared for giving training for school teachers, teacher trainees and teacher educators with differentiation.

• The population for this study were students of standard 5 and 6. Screening tests for lower standards can be developed.

• The study was confined to a sample of English medium schools. It can be replicated to Malayalam medium students also.

• The experimental sample was limited to 76 students. The study can be replicated on a large sample to ensure the general applicability of findings.

• A study on the various extraneous variables which have its influence on the reading ability of Dyslexic students can be considered.

• The study can be replicated in Government schools of all districts in Kerala state.

• A study can be conducted to find out the relationship between Learning Disability, reading skills, reading interest, creativity and academic achievement of Dyslexic students.

• An attempt may be made to prepare a Package for minimising reading disorders among juvenile delinquents and orphans.

• There are only limited researches in the field of Learning Disabilities reported from Kerala. The study revealed the need for having reliable diagnostic tools that are suitable to the Indian situations. Hence development of standardised diagnostic tools on all areas of Learning Disabilities can be a vast area for many Investigators. Survey can be conducted with regard to the identification of difficulties of children in the Governmental schools of Kerala. This may enable the education department to plan and execute remedial measures at various levels.
• Case studies can be conducted for severe Dyslexics to pinpoint the crucial issues and hard spots in reading.

• Institution related factors like instructional strategies, library facilities, extracurricular activities and infrastructure facilities combined with some pupil related factors and some modern approaches to reading ability in Dyslexic children can be assessed.

• Attitude of educational practitioners, administrators, curriculum framers, teachers and students towards inclusion of remedial Multimedia Packages to improve reading skills in school curriculum can be studied.

• The attitude of teachers towards development and use of MMP in classrooms to improve the Reading Skills of pupils can be studied.

6.6 Conclusion

The present study reveals that the reading miscues of upper primary school students with Dyslexia can be minimised and thereby their performance in reading can be increased with the implementation of the Multimedia Package. The study also throws light to the fact that the Multimedia Package is effective in enhancing the reading skills and also for prolonged retention among Dyslexic school students. The best teaching methods are diagnostic and prescriptive. Prevention is better than cure and if all the children were taught in a more structured manner with great emphasis on the use of the Multisensory Approach, most of the problems of Dyslexic children who need remedial help can be solved. Children aren’t careless but they are cared less. So teachers must teach Dyslexic children in such a way that he/she is expected to “learn to read” and not merely “read to learn”. Perhaps, the next decade will have greater support for Dyslexic children with better learning environment and enrichment. Our children are born to win. We are their leaders who must lift them upto higher levels. Let us join hands to make this a better world and bright world for our children.