NEW AND SIGNIFICANCE OF THE STUDY

Education is the birthright of every child. The State has the moral and constitutional obligation to educate its people. Education is of cardinal importance to effect the proper cultural and intellectual development of citizens, who in turn will contribute to the progress and well-being of the nation. School is the principal shaping agency outside home for the child. The initial grooming has to be done in line with the age, ability, gender, educational requisitions and the overall skills of the learner. The needs of the learners are seldom taken care of in the process of teaching under realistic school conditions.

In schools, students from various backgrounds with varying interests, needs, abilities and learning styles come together only to receive homogeneous instruction that does not take care of individual differences in learning. Among these students, there are many intelligent ones who are never given opportunities to showcase their talents and skills. Most of them suffer from a frequent and common processing problem named dyslexia. The teachers are not fully equipped to deal with such children who suffer from learning problems like dyslexia.

Dyslexia, the most prevalent type of learning disability, affects an individual’s ability to acquire skills related to reading. It is a lifelong disorder and the prognosis depends on the specific pattern of strengths and weaknesses within the individual and the appropriateness of intervention. With effective intervention, individuals with dyslexia can compensate well and become efficient readers although perhaps somewhat lower than the average. Dyslexic children are often labelled as lazy, unmotivated, careless and untidy. Teachers and parents have problems dealing with them and it results in consistent failures followed by emotional crises. One of the major causes of underachievement in children is dyslexia, a ‘hidden’ disability (Riddick, 1996) as there are no obvious external symptoms for people to recognise. The frequency of dyslexia is very high. In their sample of over 5000 British children between the ages of 9 and 11, Yule, Rutter, Berger and Thompson (1974) found that three to six percent could be classified as dyslexic. Benton (1975), and Lovell, Shapton & Warren (1964) have observed that boys more frequently have reading problems than girls do. Choudary (2012) reported that prevalence of learning disability is 10.25% in Class III to V at Bikaner
City, India. Mogasale (2012) reported that prevalence of specific learning disabilities was 15.17% among school children aged 8-11 years in Belgaum, Karnataka.

The investigator being in the field of education for the past many years is conversant with the many types of learning difficulties especially reading difficulties. Dyslexia, if left undiagnosed, will hinder the academic progress of an individual. It is now understood that timely detection and appropriate educational intervention can alleviate the condition to a very great extent.

One of the grave problems in our classrooms is the difficulty on the part of the learners to adapt to the kind of instruction imparted to them. Many children suffer from disability with regard to language skills and mathematics. The disability may be in the form of inability to express themselves in speech, reading or writing or a lack of ability with regard to numbers and figures. Since this is almost a hidden handicap, it is uncommon on the part of teachers and parents to understand it and provide help accordingly. Today, awareness about these issues has been on the increase and hence teachers recognize the difficulty experienced by learning disabled children. But they are seldom in a position to provide an appropriate intervention strategy for these children. Though lot of research has gone into understanding the nature, symptoms, diagnosis and management strategies of learning disability, highly effective teaching-learning strategies have not been made available for use. Hence it is worthwhile to think about more appropriate, technology-based strategies for learning disabled, especially dyslexic children.

The Auditory Discrimination in Depth programme, (ADD; Lindamood & Lindamood, 1975) focused mainly on the phonemic awareness of learners. Joseph (2000) compared the effectiveness of two contemporary techniques for training phonics; word box instruction and word sort instruction. Both the word box trained group and the word sort trained group performed significantly better than the control group on phonemic segmentation and word identification tests. The word box group found also superior at phoneme blending and pseudo word naming compared to the control group, and the word sort group was superior on spelling performance compared to the control group.

The above-mentioned studies indicate that intervention programmes are helpful in bringing about improvement in phonemic awareness and reading ability of both dyslexic and non-dyslexic children. Therefore the investigator decided to utilise the effectiveness of multimedia package in enhancing the phonemic awareness instruction and vocabulary instruction in English. Multimedia packages as intervention programmes were not readily
available for children in our state. Hence the researcher prepared a multimedia package for teaching English to dyslexic children at elementary level. The dyslexic students are in the normal schools with the non-dyslexic students. However they are not able to catch up with the instruction that is imparted in the inclusive classrooms. Investigations (IEDC, 1986; Clarks, Dyson and Milward, 1995; Stakes and Hornby, 2000; Frederickson and Cline, 2002) showed that inclusive education results in improved social development and academic outcomes for all learners.

The multimedia package for teaching phonemic awareness instruction and vocabulary instruction in English to elementary level students, especially dyslexics, was prepared after reviewing the available theories and research literature. The newly developed package incorporated instructional materials for bringing about improvement in the two important aspects viz., phonemic awareness instruction and vocabulary instruction related to reading. Does the multimedia package enable the teachers to deal with phonemic awareness instruction and vocabulary instruction in a better manner than the conventional method? Is the multimedia package effective in significantly enhancing phonemic awareness and vocabulary acquisition of dyslexics and non-dyslexics than the prevailing activity method of teaching? Is there any visible trend in the effectiveness of the multimedia package on dyslexics and non-dyslexics and if there is, is it encouraging enough to prove its efficacy in an inclusive classroom setting? To what extent do the elementary level English teachers use multimedia for teaching reading? What are the practical difficulties likely to be encountered by them while applying multimedia strategy in teaching English? These research questions formed the basis for the present study.

**STATEMENT OF THE PROBLEM**

The present study is titled as:

**DEVELOPMENT OF A MULTIMEDIA PACKAGE FOR AUGMENTING PHONEMIC AWARENESS AND VOCABULARY INSTRUCTION IN ENGLISH AT THE ELEMENTARY LEVEL WITH SPECIAL REFERENCE TO DYSLEXIC STUDENTS**

**DEFINITION OF KEY TERMS**

The key terms used in the present study are defined for clarity which are as follows:

**Development**: The process of creating a new product or method (Macmillan dictionary, 2011).
**Multimedia package:** In this study multimedia package means the newly prepared computer software programme incorporating video, audio, text, graphics and animation to enhance learning on the part of children at the elementary level especially dyslexics. It includes learning materials and exercises suitable to the age and ability of the learners and requires less assistance from elders.

**Phonemic awareness:** Phonemic awareness refers to the conscious awareness and knowledge that words are composed of separate sounds or phonemes and the ability to manipulate sounds in words (Smith, Simmons, & Kame'enui, 1995).

**Vocabulary Instruction:** The teaching of vocabulary through explicit, implicit, multimedia, capacity and association methods (As referred to in the Report of the National Reading Panel, 2000).

In the present study, a multimedia learning package was developed and used by the investigator to find out the effectiveness in augmenting the phonemic awareness instruction and vocabulary instruction in English of elementary level students, especially dyslexics when compared to activity method.

**Dyslexic students:** ‘Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. (The International Dyslexia Association, 2002). Those students who suffer from dyslexia are referred to as dyslexic students.

**Elementary level:** Elementary education covers the primary (6-11 years) and upper primary (11-14 years) age group (Tara Betiille, 2002). In this study, elementary level means primary classes comprising of standards three, four, five and six.

**HYPOTHESES OF THE STUDY**

1. There is no significant difference between the dyslexics in the experimental and control groups in their mean pre-test phonemic awareness scores.
2. There is no significant difference between the dyslexics in the experimental and control groups in their mean post-test phonemic awareness scores.
3. There is no significant difference between the dyslexics in the experimental and control groups in their mean pre-test vocabulary scores in English.
4. There is no significant difference between the dyslexics in the experimental and control groups in their mean post-test vocabulary scores in English.
5. There is no significant difference between the non-dyslexics in the experimental and control groups in their mean pre-test phonemic awareness scores.

6. There is no significant difference between the non-dyslexics in the experimental and control groups in their mean post-test phonemic awareness scores.

7. There is no significant difference between the non-dyslexics in the experimental and control groups in their mean pre-test vocabulary scores in English.

8. There is no significant difference between the non-dyslexics in the experimental and control groups in their mean post-test vocabulary scores in English.

9. There is no significant difference between male and female dyslexics in the experimental group in their mean phonemic awareness and vocabulary scores in English.

10. There is no significant difference between male and female non-dyslexics in the experimental group in their mean phonemic awareness and vocabulary scores in English.

OBJECTIVES OF THE STUDY

The objectives of the study are given below.

1. To prepare and validate a multimedia learning package – Resources for English advancement of elementary level dyslexics (READ).

2. To compare the effectiveness of the multimedia learning package (READ) over activity method in augmenting the phonemic awareness of elementary level dyslexics.

3. To compare the effectiveness of the multimedia learning package (READ) over activity method in augmenting the vocabulary acquisition in English of elementary level dyslexics.

4. To compare the effectiveness of the multimedia learning package (READ) over activity method in augmenting the phonemic awareness of elementary level non-dyslexics.

5. To compare the effectiveness of the multimedia learning package (READ) over activity method in augmenting the vocabulary acquisition in English of elementary level non-dyslexics.

6. To find out the visible difference, if any, in the adjusted mean scores in phonemic awareness of dyslexics and non-dyslexics in the experimental and control groups.
7. To find out the visible difference, if any, in the adjusted mean scores in vocabulary acquisition in English of dyslexics and non-dyslexics in the experimental and control groups.

8. To study the gender influence on the effectiveness of the multimedia learning package (READ) in enhancing the phonemic awareness and vocabulary acquisition in English of elementary level dyslexics.

9. To study the gender influence on the effectiveness of the multimedia learning package (READ) in enhancing the phonemic awareness and vocabulary acquisition in English of elementary level non-dyslexics.

10. To elicit the views of elementary level English teachers on the extent of use of multimedia in teaching English.

11. To deduce the views of elementary level English teachers on the practical difficulties likely to be encountered by them while using multimedia in teaching English at elementary level.

12. To suggest remedial measures based on the opinion of teachers for facilitating the use of multimedia in elementary level English teaching.

**METHODOLOGY IN BRIEF**

Experimental method was used for testing the effectiveness of the newly developed multimedia package on variables like phonemic awareness and vocabulary acquisition. The non-equivalent pre-test-post test design was used for collecting the data for the study. The independent variables selected were the activity method and the method using the newly developed multimedia package.

The adapted version of the slinger land procedure (V.V. Joseph, 2011) was used by the investigator to confirm dyslexia in the sample. The students were given a small selected paragraph to read and the mistakes in the form of transposition, reversal, omission, substitution, inversion, pauses and phonic difficulties were identified. The major tool used for the study was the multimedia package developed and validated by the investigator. A test of phonics and vocabulary prepared by the investigator was used as pre and post tests for collecting the data.

The sample included a total of 165 students. The dyslexic control and experimental groups consisted of 34 students each from ten schools. The non-dyslexic control group consisted of 50 students, and 47 students were included in the non-dyslexic experimental
group. The said students belonged to two divisions of one of the schools. The names of schools are concealed due to ethical reasons.

The statistical techniques for the study:

1. Two tailed Test of significance of difference between means
2. Analysis of Covariance (ANCOVA)

SCOPE AND LIMITATIONS OF THE STUDY

The study is aimed at developing the phonemic awareness and vocabulary acquisition of dyslexic students. But the investigator extended the study to non-dyslexic students and thus the scope is not limited to mere comparison of experimental and control group of dyslexics.

In the present study, the investigator has tried to avoid possibilities of sampling and other errors for making the result of the study valid and reliable. Yet certain limitations have crept in. Only certain selected strategies and games have been used in the multimedia package. The package has been developed for teaching only one skill, i.e., reading. The prepared multimedia package will be a useful intervention for only one type of learning disability, i.e., dyslexia.

The study is not limited to the experimental strategy namely, (READ), but extended to the conventional activity method of teaching also.

Though the study is conducted using experimental method, the sample is limited to 165 students spread over four groups. The experiment is conducted in non-equivalent groups. It has certain limitations. Even though the control and experimental groups do not differ significantly in their mean pre-test scores in phonemic awareness and vocabulary, the investigator applied the statistical technique ANCOVA in order to compensate for the non-equivalent groups design used in the present study.

The tools prepared for the study have their own limitations. Since all efforts have been done to adopt the conventional procedures to be followed in developing the tools, the investigator feels confident about the validity and reliability of the tools.

It is hoped that the findings of the study are generalisable to a great extent and useful in the hands of those who are interested in bringing about desirable changes in the educational scenario.
MAJOR FINDINGS OF THE STUDY

The major findings arrived at from the study are given below.

1. Comparison of phonemic awareness scores of dyslexics revealed that the obtained Fx (Fx = 0.01; p > 0.05) value is not significant. The obtained Fx value shows that the random assignment of subjects to the two groups was quite successful. The Fy obtained (Fy = 54.22; p < 0.01) is significant at 0.01 level. The analysis of variance of the ‘y’ means indicates that there exists significant difference between dyslexic students belonging to experimental group and control group in their post-test scores.

2. The Fy.x ratio obtained is significant (Fy.x = 113.16, p < 0.01). It shows that the final means differ significantly after they have been adjusted for initial differences in pre-test scores.

3. When the adjusted means for the experimental and control groups were tested for significance, the obtained t-value is 10.64, which is significant at 0.01 level. This shows that the two means differ significantly. As the adjusted mean score for the experimental group (17.8) is higher than that of the control group (13.6), the experimental group can be said to be superior to the control group. Hence, it can be concluded that the multimedia package prepared by the investigator is more effective than the activity method in enhancing phonemic awareness of elementary level dyslexic students.

4. Comparison of vocabulary scores of dyslexics revealed that The Fx (Fx = 2.42) value is not significant which shows that the random assignment of subjects to the two groups was quite successful. The Fy obtained (Fy = 78.96) is significant which indicates that there exists significant difference between dyslexic students belonging to experimental and control groups in their post-test vocabulary scores.

5. The obtained Fy.x ratio is significant (Fy.x = 160.79, p < 0.01). It shows that the final means differ significantly after they have been adjusted for initial differences in pre-test scores.

6. Comparison of the adjusted mean scores of the experimental and control groups showed significant difference (t value = 12.91; p < 0.01). As the adjusted mean score for the experimental group (20.3) is higher than that of the control group (15.2), the experimental group can be said to be superior to the control group. Hence, it can be concluded that multimedia package prepared by the investigator is more effective than
activity method in enhancing the vocabulary acquisition in English of elementary level dyslexic students.

7. Comparison of phonemic awareness of non-dyslexics revealed that the obtained Fx (Fx = 0.01) value is not significant. The obtained Fx value shows that the random assignment of subjects to the two groups was quite successful. The Fy obtained (Fy = 128.45) is significant at 0.01 level. This shows that there exists significant difference between non-dyslexic students belonging to experimental and control groups.

8. The obtained Fy.x ratio is significant (Fy.x = 242.06, p < 0.01). It shows that the final means differ significantly after they have been adjusted for initial differences in pre-test scores.

9. Comparison of the adjusted mean scores of the experimental and control groups showed that there is significant difference between the experimental and control groups in their adjusted mean scores (t = 15.65; p < 0.01). As the adjusted mean score for the experimental group (22.6) is higher than that of the control group (15.9), the experimental group can be said to be superior to the control group. Hence, it can be concluded that the multimedia package prepared by the investigator is more effective than the activity method in enhancing the phonemic awareness of elementary level non-dyslexic students.

10. Comparison of vocabulary scores of non-dyslexics revealed that the obtained Fx value is not significant (Fx = 0.17; p > 0.05) which shows that the random assignment of subjects to the two groups was quite successful. The Fy obtained (Fy = 267.21) is significant at 0.01 level which shows that there exists significant difference between non-dyslexic students belonging to experimental and control groups in their post-test vocabulary scores.

11. The obtained Fy.x ratio is significant (Fy.x = 291.98; p < 0.01). It shows that the final means differ significantly after they have been adjusted for initial differences in pre-test scores.

12. Comparison of the adjusted mean scores of the experimental and control groups showed significant difference (t = 17.10; p < 0.01). It means that the experimental group and control group differ significantly. As the adjusted mean score for the experimental group (25.4) is higher than that of the control group (16.1), the experimental group can be said to be superior to the control group. Hence, it can be concluded that multimedia package prepared by the investigator is more effective than
activity method in enhancing vocabulary instruction in English of elementary level non-dyslexic students.

CONCLUSION

The major conclusions of the study are given below.

The relative advantage of the multimedia package over activity method of teaching was proved and the same confirmed that the developed multimedia package is very effective in enhancing the phonemic awareness and vocabulary acquisition in English of elementary level dyslexics. The administration of the multimedia package on non-dyslexics and subsequent testing of its effectiveness also provided the same results.

A noteworthy trend found in the study is that while the experimental group of dyslexics and non-dyslexics exhibited a higher gain in the adjusted mean scores in phonemic awareness and vocabulary in English, the non-dyslexics showed greater performance than dyslexics. But this trend is not visible in the adjusted mean scores obtained by both dyslexics and non-dyslexics in the control group. This revealed that the multimedia package is not only effective in enhancing the phonemic awareness and vocabulary acquisition of dyslexics and non-dyslexics compared to the activity method of teaching, but it is also capable of elevating the phonemic awareness and vocabulary acquisition in English of elementary level non-dyslexics to an exceptionally higher level than the dyslexics. This again shows that the multimedia package can be successfully implemented in inclusive classroom settings without annoying the class. But in activity method, this is not possible smoothly where special attention is to be given to dyslexics which may cause disturbance in the classroom while balancing the teaching learning process to suit the needs of dyslexics.

EDUCATIONAL IMPLICATIONS

One of the major contributions of the study is the development of a multimedia learning package for enhancing the phonemic awareness and vocabulary acquisition in English of elementary level students which the experts rated as very effective for the purpose it was meant for. The effectiveness of this package over activity method of teaching in enhancing the phonemic awareness and vocabulary acquisition in English of elementary level students was also established through a comprehensive experiment. This proves the acceptability of the multimedia learning package developed by the investigator in actual classroom situation. It is recommended that the multimedia package developed by the investigator is to be used in all elementary level classrooms in Kerala for the enhancement of phonemic awareness and vocabulary acquisition in English.
A major strength of the multimedia package lies in the fact that it can be successfully practised in an inclusive classroom setting. Often, dyslexics are ignored in the normal class rooms due to the lack of competent teachers to attend to their problems. Also, there are so many elementary level dyslexics in our schools who were not identified as dyslexics but labelled as low achievers. As the multimedia package developed was found very successful in inclusive classrooms, even those who are not identified as dyslexics but have reading disability may benefit greatly if taught using this learning package. Both the teachers and students, especially the dyslexics, may feel more relaxed while using the multimedia package when compared to a classroom which provides curriculum transaction in the conventional method.

Overcrowded classrooms were the foremost hindrance pointed out by teachers in implementing multimedia learning strategy in classrooms. As multimedia strategy requires use of computers, adequate measures have to be taken to equip our schools with sufficient resources for effective use of multimedia for teaching-learning. Students, especially dyslexics, should be given ample time to get acquainted with the strategy and teachers should always be available to help them in realising this.

Lack of training and practice were also shown as impediments in using multimedia strategy by teachers. Teachers should be given in-service training as and when required on the proper and effective use of multimedia strategy in classrooms. Newer and more learner-centric technologies, especially multimedia packages as the one utilised in the present study, has to be made part of the teacher preparation curriculum to make teachers confident in utilising these technologies. The advent of internet has made the sharing of new knowledge faster and free. Unless teachers are not adequately trained and equipped, they will become out of sync with the upcoming realities. As the new generation of students are likely to be more proficient in technology than teachers, it may not be surprising if the students outsmart their teacher if he/she does not have due training in the use of technology in classroom situation. It is pertinent to note that our teacher preparation programmes, whether it be TTC, B.Ed. or M.Ed., tend to give due recognition to newer technologies, especially multimedia based teaching-learning tools, in the syllabi. Curriculum planners and policymakers should initiate necessary steps to revise the teacher preparation curriculum so as to include multimedia enabled teaching-learning strategies. Practice teaching is to be conducted by incorporating the use of technology in the actual classroom situations.
It is disheartening that our schools, especially those which practise state syllabus, do not give due importance to the teaching and learning of English. In this technological era, knowledge of English language which is recognised as an international language, coupled with proficiency in computer and technology are essential for a successful career. Hence a restructuring of our curriculum to meet the demands of the future citizens has become essential. The progress and prosperity of the individual ultimately will result in the progress of the nation. If our children are to be meritorious enough to compete in a world where lack of communicative skill in English and computer literacy is considered as illiteracy, it is high time that proper improvement in the prevailing method of teaching-learning and inclusion of more learner and teacher friendly practices like the multimedia oriented learning packages are to be contemplated. Unless timely measures are not initiated to meet this end, the overall social and educational advancement of our society will be hampered.

SUGGESTIONS FOR FURTHER RESEARCH

1. A study can be conducted to find out the effectiveness of multimedia strategy in teaching English for dysgraphics at secondary level.
2. Preparation and testing of a multimedia package in enhancing the arithmetic skills of elementary level students, especially those with dyscalculia.
3. A study can be done on the effectiveness of a multimedia package to minimise dysgraphia at the elementary level.
4. A study can be conducted to find out the efficacy of using multimedia strategy in teaching writing skill at the upper primary level, especially dyslexics.
5. Development of a multimedia strategy for teaching Hindi for dyslexics at the elementary level.
6. Development of a multimedia package for developing communicative skill in English of dyslexics.
7. The present study can be conducted on a larger sample with due representation to locality and socio-economic status of the students.
8. A study can be conducted on the relationship between teacher proficiency in using multimedia and student achievement.