EFFECTIVENESS OF TEACHING LEARNING MATERIAL ININSTRUCTION OF ENVIRONMENTAL SCIENCE TO PRIMARY SCHOOL CHILDREN WITH HEARING IMPAIRMENT

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University of Mysore

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MANASAGANGOTHRI, MYSURU-570006

MAY, 2015

DEDICATED TO….

MY EVER UNDERSTANDING HUSBAND

AND MY FAMILY

CERTIFICATE

This is to certify that this dissertation entitled **"Effectiveness of Teaching Learning Material in Instruction of Environmental Science to primary school children with Hearing Impairment"** is a bonafide work submitted as a part fulfilment of the degree of Master of Special Education (Hearing Impairment) of the student with Registration Number 14MSD005. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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CERTIFICATE

This is to certify that this dissertation entitled **"Effectiveness of Teaching Learning Material in Instruction of Environmental Science to primary school children with Hearing Impairment"** has been prepared under my supervision and guidance. It is also certified that this has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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DECLARATION

This dissertation entitled **"Effectiveness of Teaching Learning Material in Instruction of Environmental Science to primary school children with Hearing Impairment"** is the result of my own study under the guidance of Dr. Alok Kumar Upadhyay, Reader in Special Education, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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Abstract

Teachers have to make learning meaningful and interesting, create learning environment that are meaningful to the children, meets their individual needs and encourage learning in holistic, equitable and culturally sensitive way. Children with hearing impairment find it difficult to understand verbal mode of lecturein the classroom. Environmental science is a subject which involves abstract concepts, so, teaching learning material helps to convert these difficult concepts into simple concepts. In this study the researcher had used different types teaching learning material to teach the concept of food for health in the instruction of environmental science. Such as charts, flash cards, models, real objects and multimedia etc. Present study was a true experimental design of randomly selected control and experimental groups contains 30 students of class 4^{th}as subjects in the age group of 9 to 11 years. The main objectives of study to develop the appropriate teaching learning material for instruction in "food for Health" and Studying the efficacy of developed teaching learning materials., After using appropriate analysis of the data which was collected from the pre and post-test compared the results of control group with experimental group. The Finding of the study revealed that there was a significant improvement in the post test of experimental group compared with control group; this was due to the use of teaching learning material in the instructional process.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1 Children with Hearing Impairment

According to PWD Act (1995), “Hearing impairment means loss of 60dB or more in the better ear in the conversational range of frequencies (250 Hz to 4k Hz).World Health organization reports that hearing impairment is a sensory impairment, it effects on hearing sense and it will greatly impact on their functional skills, social and emotional skills and economic skills”. This impairment will create a gap between hearing children and hearing impaired children. Mastineaes, Lamasche, Marcouse, Bernard (2001) research shows that for children who receives early intervention and support the gap can be reduced between hearing children and hearing impaired children. So, support should be provided in the early stages of life of the children with hearing impairment.

1.2. Children with hearing impairment and different subjects

There are different types of core subjects are available in the school and the children should read all these subjects i.e. English, mathematics, science etc. English is a subject which is helpful to communicate effectively with other people. Language is very important to lead our life successfully. In early stages if we train children in one language without the confusion of other subjects, then the children will learn the language better.

Mathematics: It is a subject which involves logics and analytical comprehension. It will be helpful in our daily life like purchasing, selling, savings etc. Activities need addition, multiplication, subtraction etc.

Science: It is more scientific in nature. It involves systematic enquiry, analysis of problems, creation of ideas and their evaluation and modification. It helps the students to comprehend the world around them. Usage of traditional methods for the instruction of these core subjects may not be so effective to bring better results. Other reasons like irrelevant curriculum, improper teaching of abstract concepts, higher level of language usage, irregular coordination between the time and instruction etc. may leads to poor results of school children with hearing impairment.

1.3. Importance of Environmental Science

According to Gemma Garrett (2002), environmental science is important to learn for all the students and make them to experience, enjoy and examine the wonders of natural and manmade world around them. It also helps them to evaluate their ideas. It provides opportunities for children to work with scientific enquiry and to draw conclusion about what they found out.

- Environmental science helps the students to develop curiosity and provide opportunities to improve their observational skills, thinking, reasoning skills.
- It helps to acquire knowledge about the world around them and create interest to learn science.
- It makes the students to understand and create awareness about the healthy life such as healthy eating, personal hygiene, substance use and abuse etc.

- It helps them to acquire knowledge about how their bodies functions and changes they experience (including puberty).
- It provides the exposure of other concepts which are not encountered in the other sciences such as growth and development, diversity and change, interdependence and classification, natural selection and evolution etc.
- It provides knowledge about the geography, history, economics, civics etc.
- It makes aware of students that they are part of the diversity of living things.
- It develops personal values and sense of responsibility with regard to living organisms and their environment.
- It provides an opportunity for informal learning in and about their environment.

1.4. Academic Achievement of children with hearing impairment

According to Gandhiji, the aim of education is all round development. It should leads to physical, intellectual and spiritual development of the learner. Performance in academics is called as academic achievement. Education will help to develop knowledge and skills which requires leading our life. Academic achievement is a combination of ability and effort.

Hearing impairment is a sensory impairment. Because of the loss of hearing they may not be able to communicate with other people; due to this they may not be able to develop their language. It leads to educational handicap. The impairment not only effect on functional, physical and emotional skills but it also effects on educational achievement. "Myklebust (1960) said that hearing is a pervasive thing. The impairment which is caused before the language development effects the entire personality not just the hearing part. Children with hearing impairment see and sense

their environment differently than the hearing children, there by altering their reactions and personality". (Cited in Hearing impaired students- Adjustment, Achievement motivation, and Academic achievement written by Jampalamadhubala and Digumarthi Bhaskara Rao 2007)

1.5. Importance of teaching learning materials

All the individuals are not same; they are different from each other. Same way allthe individuals do not learn in a similar manner, their learning styles may differs from each other. Some may learn through auditory way, some may learn through visual mode and some may learn through other modalities.

Pathak R. P. (1994) indicated in his book named as Teaching Skills said that- most of the children learns up to 73% through visual mode, 15% through auditory mode,6% through touch,3% through smell and 3% through taste. If we combine two modes of senses, then the process of learning will be more effective. This information indicates that multi-sensory teaching learning material plays important role in teaching learning process. Howard Gardner (1983) indicates that there are 8 different types of intelligence, which helps them to gain knowledge. Every child is different from each other. As we know that no two individuals are same, everybody have their own way of learning. Intelligence plays an important role in learning, which helps the children to lean better. This information says that multi- sensory teaching learning material helps to compliment learning with the help of intelligence and learning styles.

Teaching learning material definition

The materials which are used in the teaching learning process are called as teaching learning material. Classification of teaching learning material may include i.e. handmade materials, artificial material and multimedia based teaching learning material etc. There are different types of material which can be used in teaching learning process i.e. Flash cards, charts, models, pictures, real objects, multimedia etc.

Benefits

Following are the benefits of teaching learning material

- It enticements and grasps the attention of the students for an extended duration.
- It attracts the students towards learning.
- It makes the students to understand the difficult concepts in a simple manner.
- Children pay attention more effectively towards the teaching learning process.
- It increases the academic performance of the students.
- It creates collaboration between students and teachers.
- It maintains the teaching learning process in a smoother way.
- It is useful for both children and teachers.
- It transfers the information in an interesting way.
- It minimizes the boredom of lecture method.
- It acts like a reward for the learners to perform better in academics.
- These teaching learning materials are accessible to the learners.
- Learners have an opportunity to select their choice of learning material which boosts their performance in examination.

- It reduces the psychological stress of the children by making the teaching learning process in a simple manner.
- It enhances the methods of teaching.

Environmental science is a subject which involves abstract concepts. So, teaching learning material helps to convert these difficult concepts into simple concepts. In this study the researcher had used different types teaching learning material to teach the concept of food for health in the instruction of environmental science. Such as charts, flash cards, models, real objects and multimedia etc.

1.6. Need for the study

Teachers have to make learning meaningful and interesting, create learning environment that are meaningful to the children, meets their individual needs and encourage learning in aholistic, equitable and culturally sensitive way.Children with hearing impairment find it difficult to understand verbal mode of lecture in the classroom.

According to Meadow- Oralans (1980) the learning process is slower in hearing impaired children, children with hearing impairment of mild to moderate hearing loss on an average, achieves one four grade levels lower than their peers with normal hearing, unless appropriate management occurs. They have problems in understanding scientific formulas, equations etc. They have problem in imagination. Example: solar system, digestive system, nervous system etc. They have problem in understanding abstract concepts like geography, history etc. Imparting knowledge not only requires intellectual skill and subject knowledge but also ensure that the content matter is understandable to the student in a simple and easy manner yet in a short span of time. Teaching learning material therefore used to enhance the learning skills in a

systematic manner and retaining them in mind for a longer duration. It can be anything that a teacher used in the instructional process i.e. devices, equipment's, illustrations, simulations or other items that improves teaching learning process.

Teaching learning material makes the students to learn meaningfully and it removes the barriers of learning. Taking this into consideration a need was felt to undertake the study Titled "Effectiveness of Teaching Learning Material in Instruction of Environmental Science to primary school children with Hearing Impairment".

1.7. Statement of the problem

This research proposes to do an experiment with selected teaching learning material in instruction of Environmental science and evaluate their effectiveness on performance of children with hearing impairment in primary school.

1.8. Operational definitions of key terms

Children with hearing impairment:

According to PWD Act (1995), Hearing impairment means loss of 60dB or more in the better ear in the conversational range of frequencies 250 Hz to 4 k Hz.

Teaching Learning Material:

The material used in the teaching learning process. In this study teaching learning material used are- charts, models, flashcards, real objects and multimedia etc.

Primary school:

Children with hearing impairment (age: 09 to 11 years), who are studying with typically developing children in inclusive school of 4th class.

1.9. Objectives of the study

The following objectives were taken to conduct the research

- To develop the appropriate teaching learning material for instruction in "food for Health"
- To reinforce the already learnt concepts related to food for health in environmental science.
- Studying the efficacy of developed teaching learning materials.

1.10. Research design of the study

This study was a true experimental design with randomly selected control and experimental groups which were used in the research.

1.10. Delimitations of the study

The following were the delimitations of the study.

- The study was limited to only primary school of 4^{th} class.
- It was restricted to only environmental science.
- The study was restricted to only Mysore city.

CHAPTER II

REVIEW OF LITERATURE

2.1. Introduction

Review of literature is very vital in the research process. This chapter helps the researcher to comprehend the previous research works related to the present study and to get the knowledge about the authors who had done the research work and how they have done the research. Review of literature helps the researcher to plan and investigate the research process in a proper direction based on the previous studies. In this chapter the researcher has given a summary of previous researches which are directly or indirectly related to the present study which is named as "Effectiveness of Teaching Learning Material in Instruction of Environmental Science to primary school children with Hearing Impairment".

2.2 Difficulties in environmental science subject for children with hearing impairment

Children, who are developing typically, learn language naturally without any formal training. But it is not possible in case of hard of hearing students, because hearing impairment is a sensory impairment. So, children with hearing impairment have problems in hearing, it creates problems in learning language. Ray (2001) said that children with hard of hearing have problem in acquiring language naturally. As we all know that all the subjects were depends upon the language, due to this they perform poor in academics.

Marineaes et al., (2001), researches said that the children with hearing impairment who gets early intervention and support services, the gap can be minimized between hearing children and hard of hearing children.

Leigh and stinson (1991) andstoefan – fisher and balk (1992) has given an evidence that the children who are in regular or in segregated schools have difficulty to overcome their problem of hearing loss and to maintain their personality in the hearing society. Environmental science is a subject which is the study of nature and it involves thinking and problem solving skills. Science education not only influences their academic achievement but also its influence on their day to day life and their future employment.

Madsen, lamb and Kidd (1993) and Milkalsen (2000) research reported that on an average, children with hard of hearing were lag behind the typically developing children in academic performance. According to Boyd, George (1973) and Grant, Rosensten and Knight (1975), the performance of children with hearing impairment were poorer compared with typically developing children even when they educated in hand on learning with limited verbal information. Vosniadu and Brewer (1987) reported that environmental science learning is difficult for children with hearing impairment due to the incompatibility which exist between the learner's innate explanation or justification of natural phenomena and scientific explanations. Environmental science deals with the nature which is based upon the everyday life. The knowledge which the learners gain from outside the classroom helps them to learn new information inside the classroom. In the process of learning science, the students restructure and link the previous knowledge with new information to make it easy for them to learn science. This process of concept restructuring is difficult for

children with hard of hearing and sometimes it will lead to misconceptions. It leads to poor performance of environmental science compared with their hearing peers.

Studies done by Molanderet al., (2001) reported that children with hearing impairment have difficulty in connecting with different science subjects. There is a greater gap between science and alternative reasoning for children with hearing impairment compared with typically developing children due to the less exposure of informational science.

Wakeetal., (2004),Antiaetal., (2005), ohana (2005) and Lukner et al., (2005) reported that children with hard of hearing has limited language and literacy skills compared with their typically developing peers due to the limited access of phonological code, poor fluency in language, less early exposure of literacy skills and limited vocabulary. This literacy problem also leads to poorer scores in academics. Studies conducted by the authors like Harrington (2000) and Lang et al., (2006) has reported few reasons for the lower level of performance of environmental science in academics i.e. lack of literacy skills and limited exposure of incidental learning from the conversations of people who are in the hearing society and also the poor comprehension of vocabulary related to environmental science.

Science is a subject which involves abstract concepts, through visual information and activities like learning by doing, helps the children to learn better. As we know that in most of the schools, teachers use verbal mode of teaching to impart knowledge in the instructional process. Children with hearing impairment has problem in hearing, due to this problem, they perform low in their academics. Most of the children who are hard of hearing are visual learners. So, visual clues help them to perform better in exams. Hence, there is a need to teach them with the help of teaching learning material. The material which helps to improve the teaching learning

process is called as teaching learning material. Not only visual, other modes of senses also play an important role in the achievement process. So, multisensory method sare recommended to teach hearing impaired children.

"Pestalozzi" was the first person who introduced teaching learning material in his teaching process. In his yverden school, this is known as Mecca of education. In this school he had used different types of material i.e. charts, pictures, live objects etc. provides direct experiences to the learners to learn environmental science.

All wright (1990) reported that text books are inflexible for teaching. They says that the teaching learning material helps the students to learn and act like resources for providing new ideas to them. Research of Gilder (1985) and Edgeron(1989) reported that the functioning of the nervous system i.e. left and right brain have justified that visual cues are most effective to comprehend the information, because these activate both the right and left brain as compared to the verbal which activates only the left side brain.(cited in the book named as- utilization and maintenance of teaching learning material written by Suman Sindhu)

Suman Sindhu(2007) in her book named as Utilization and maintenance of Teaching Learning Material said that multi-sensory materials are a kind of teaching learning material, which helps a student in acquiring appropriate learning experiences using the sense organs, related to vision, hearing, touch, smell and taste. Pathak R.P. (1994) said that the teaching learning material provides an opportunity to utilize their senses to acquire knowledge. Another study which was investigated by Wickham and versveld (1998) reported that teaching learning material helps the learners as well as the teachers by improve teaching learning process.

According to Edger Dale (1969), when we combine one sense with another sense for teaching, then it is called as multi-sensory methods. He says that the verbal mode of teaching is the least effective compared with multi- sensory teaching learning material. A study which was done by Shri Krishna Mishra (2013) on the use of teaching learning material in science at upper primary school, reported that teaching learning material helps the learner to learn science in a better manner. It leads to clear understanding of concepts and phenomena which is involved in science .In this present study, one of the teaching learning materials which were used in the instruction of science was multi-media. It involves more than two modes of information like audio, video and text etc. This helps the hard of hearing children to acquire knowledge in an easy manner. According to Rittenhouse, Kenyon and Healy (1997), Multimedia creates a learning environment which involves the combination of television and computer based instruction. Multimedia is a technology contains audio, video, animations etc. which attract the children towards learning. Children with hearing impairment can better through this multimedia.

Rose and Waldron (1984) and Harding and Tidball (1982) reports that computer technology highly influence the hearing impaired children to learn the concepts. Activities like drills and practice programmers and simulations were play important role in learning.

CHAPTER III

METHOD

3.1. Research design of the study

The present study was a pure experimental research design to investigate "Effectiveness of Teaching Learning Material in Instruction of Environmental Science to primary schoolchildren with Hearing Impairment". This chapter describes the participants who were involved in the study and the procedure that was followed in data collection and analysis of information.

3.2. Population of the study

This research involves both hearing impaired children as well as typically developing children. In this study the population was 160 in number.

3.3. Sample of the study

Total 30 children were selected for the present study from a group of 160 children. In this 30children 10 were children with hearing impairment and the other 20 were typically developing children in the age group of 9 to 11 years.

3.4. Materials

Researcher had developed one test paper for the purpose of assessing pre and post test results of children who were participated in the study. Researcher also developed five types of teaching learning material i.e. flash cards, charts, models, real objects, multimedia for the purpose of teaching children who were involved in the study.

3.5. Characteristics of sample

Table 3.5.1: *Distribution of samples according to their socio economic status*

Socio economic status of the children		
Lower economic status	Middle economic status	Higher economic status
13	17	0

All the students who were involved in the study were 4th class students. Students wereselected based on their level of hearing and their socio economic state, i.e. moderate toprofound hearing loss with average intelligence and other additional impairments should notbe there. Children from lower and middle economic status were selected for the present study. Through randomization children were selected in each group which was called as control andexperimental groups. There were 15 children were selected in each group.

3.6. Procedure of the study

Researcher had followed a specific procedure for the evaluation of effectiveness of teaching learning material in instruction of Environmental science to primary schoolchildren with hearing impairment. The selected groups of children were divided into two groups depending upon the randomization technique. The groups i.e. control

and experimental groups had 15 children for the investigation. The children who were selected for experimental group were treated with experimental teaching learning material. The children who were in control group were studied in a traditional way.

3.7. Stages of data collection

The study was carried out in five stages.

- Stage 1. Development of test materials and teaching learning materials.
- Stage 2. Validation of developed test materials and teaching learning materials by experts.
- Stage 3. Administering the developed test material to determine base line knowledge in selected environmental science concept.
- Stage 4. Interventional instruction using the developed teaching learning materials through 10 sessions.
- Stage 5. Post-test using the developed test material to assess impact of teaching learning material.

3.7.1. Development of test materials and teaching learning materials

A concept was selected in environmental science of 4^{th} class for the instruction of experimental group. Depending upon the concept, test material i.e. test paper was developed in one language named as Kannada. The test material which was developed involves different types of questions like short answers, reasoning, matching, fill in the blanks etc. Along with that appropriate and relevant teaching learning material also developed depending upon the concept to instruct children ,i.e. Flash cards, models, charts, real objects, multimedia etc.

3.7.2. Validation of developed test materials and teaching learning material by experts

After the preparation of test material and teaching learning material, those materials were given for validation. Validation was done by 5 experts in the department of special education and improvisation was incorporated in the test materials depending upon their suggestions. After the validation fresh copy of test material was prepared for the instruction.

3.7.3. Administrating the developed the test materials to determine baseline Knowledge in selected environmental science concept

A pre- test was conducted with the help of developed test material, for both experimental and control groups to evaluate the base line knowledge of the children in the concept of food for health in environmental science. Depending upon the pre-test results of experimental group teaching technique was selected for teaching environmental science.

3.7.4. Interventional instruction using the developed teaching learning material throughten sessions

In this step the children who are involved in the experimental group were treated with appropriate and relevant teaching learning material i.e. flash cards, charts, models, real objects and multimedia etc. Teaching was done for 10 sessions with the duration of 1 hour for 15 children. Ongoing evaluation was also done through teaching learning material like models, and flash cards etc. In this instructional process more concentration was given for the children with hearing impairment.

3.8. Statistical treatment

Statistical analysis was done with the help of appropriate statistical methods to find out the results. Inferential statistics was used in this study. Test of normality and t-test were done for both experimental and control group.

CHAPTER IV

RESULT AND DISCUSSION

4.1 Introduction

A research titled “Effectiveness of Teaching Learning Material in Instruction of environmental Science to primary school children with Hearing Impairment” was investigated.

The following objectives were taken to conduct the research

- Developing the appropriate teaching learning material for instruction in “food for Health.”
- Reinforcing the already learnt concepts related to food for health in environmental Science.
- Studying the efficacy of developed teaching learning materials.

The research was investigated in 5 sections.

- Stage 1. Development of test materials and teaching learning materials.
- Stage 2. Validation of developed test materials and teaching learning materials by experts.
- Stage 3. Administering the developed test material to determine base line knowledge in selected environmental science concept.
- Stage 4. Interventional instruction using the developed teaching learning materials through 10 sessions.
- Stage 5. Post-test using the developed test material to assess the impact of teaching learning material.

The scores of the pretest of experimental and control group were calculated separately

Table 4.1: *Performance of children with hearing impairment (experimental group)on the pretest*

S.no.	**Children**	**Marks**
i.	Child 1	8
ii.	Child 2	4
iii.	Child 3	7
iv.	Child 4	6.5
v.	Child 5	7
vi.	Child 6	8.5
vii.	Child 7	8
viii.	Child 8	7
ix.	Child 9	7
x.	Child 10	7
xi.	Child 11	6
xii.	Child 12	8
xiii.	Child 13	10
xiv.	Child 14	7
xv.	Child 15	10

Table 4.2: *Performance of children with hearing impairment (control group) on the pretest*

S. no.	Children	Marks
xvi	Child 16	6.5
xvii	Child 17	5.5
xviii	Child 18	9
ix	Child 19	7
xx	Child 20	5
xxi	Child 21	6.5
xxii	Child 22	6
xxiii	Child 23	9
xxiv	Child 24	6.5
xxv	Child 25	7
xxvi	Child 26	8
xxvii	Child 27	8
xxviii	Child 28	5
xxix	Child 29	6
xxx	Child 30	6

Table 4.1 and 4.2contains the pretest result of experimental and control group

The above results say that the performances of the children were poorer in the pretest in the concept of food for health in environmental science. The scores were near similar for all the children. So, through randomization they were divided into two

groups. Those groups were named as experimental and control groups. The twogroups were divided equally and those groups had 15 children in each group.

The 15 children who were selected for experimental group were treated with experimental teaching learning material on concept of food for health in environmental science, for10 sessions with the duration of 1 hour. After teaching through teaching learning material to the experimental group, a post test was taken for experimental group. At the same time posttest was also conducted for control group. Posttest was conducted for both the groups to compare the results and to evaluate the effectiveness of teaching learning material.

Table number 4.3 and 4.4 contains the performances of posttest of control and experimental groups.

Table 4.3: *Performance of children with hearing impairment (control group) on the posttest*

S.no.	**Children**	**Marks**
xvi	Child 1	9
xvii	Child 2	5.5
xviii	Child 3	9
xix	Child 4	6
xx	Child 5	5
xxi	Child 6	6
xxii	Child 7	6.5
xxiii	Child 8	8
xxiv	Child 9	6.5

xxv	Child 10	8.5
xxvi	Child 11	7
xxvii	Child 12	8.5
xxviii	Child 13	7
xxix	Child 14	7
xxx	Child 15	6

Table 4.4: *Performance of children with hearing impairment (experimental group) on the posttest*

S.no.	**Children**	**Marks**
i.	Child 16	15
ii.	Child 17	16.5
iii.	Child 18	15
iv.	Child 19	17
v.	Child 20	17
vi.	Child 21	16
vii.	Child 22	15.5
viii.	Child 23	15.5
ix.	Child 24	13
x.	Child 25	13
xi.	Child 26	16.5
xii.	Child 27	18.5
xiii.	Child 28	17.5

xiv.	Child 29	17.5
xv.	Child 30	19.5

The above result of both control and experimental groups says that there was an improvement in both the groups. But, there was more improvement on the post test of experimental group. This proves that the teaching learning material were effective in the instructional process. The above results support the studies of Gilder (1985) and Edgeron(1989) who said that the visual information plays important role in learning.

4.2. Inferential statistics

The data which was obtained from the pretest and posttest were analyzed by the appropriate statistical methods for both the group, i.e. control and experimental group. Test of normalityand T-test of paired samples of statistics was done for both experimental and control groups.

Table 4.5: *Normality test reports of pre and posttest of control group.*

Tests of Normality				
		Shapiro-Wilk		
	Group	Statistic	df	Sig.
Pre	Controls	0.925	15	0.228
Post	Controls	0.888	15	0.062

Table 4.6: *T-test results of pre and posttest of control group*

T-Test

Paired Samples Statistics				
Test		Mean	N	Std. Deviation
Pair 1	Pre	6.7333	15	1.27988
	post	7.1000	15	1.19821

Paired Samples Test				
Test		T	df	Sig. (2-tailed)
Pair 1	pre - post	-1.319	14	0.208

Test of normality of Shapiro-Wilk test was done. Significant values are> 0.05. Hence, both pre and posttest were normally distributed. So, Paired t-test was administered to compare pre and posttest of control group. Result shows that the value of t (14) = 1.319, p > 0.05. There is no significant improvement from pretest to posttest, as evident from paired t-test.

Table 4.7: *Normality test reports of pre and posttest of experimental group*

Tests of Normality			
Test	Shapiro-Wilk		
	Statistic	df	Sig.
Pre	0.911	15	0.141
Post	0.964	15	0.767

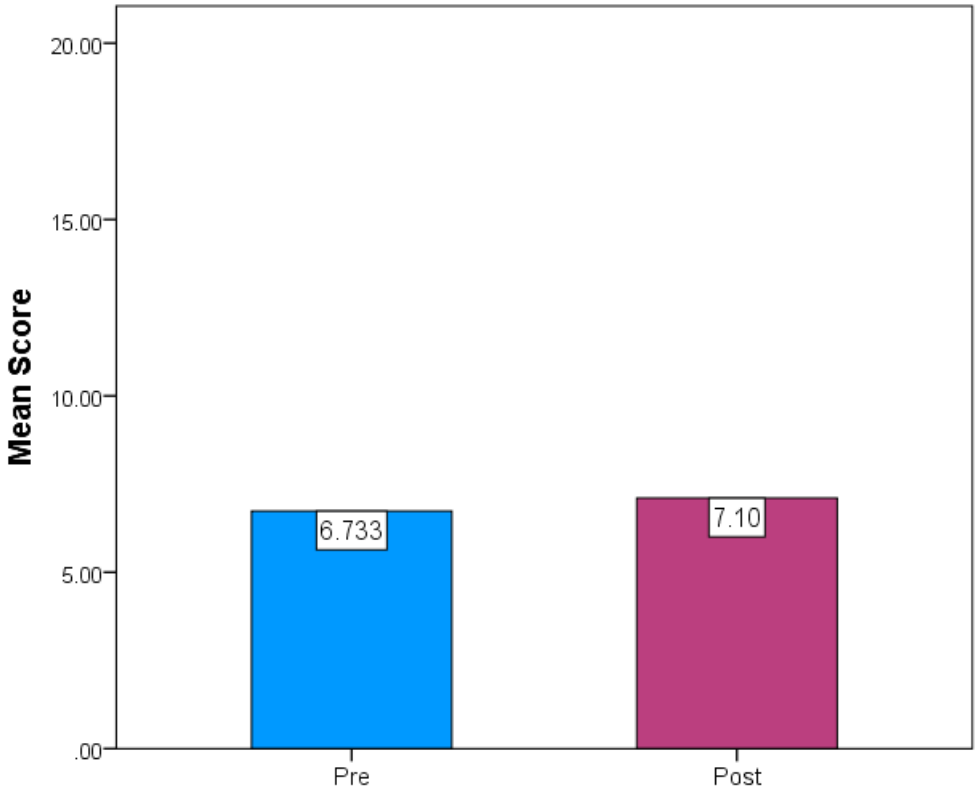

Figure 4.1: Bar graph showing the performances of pre and posttest of control group.

Table 4.8: *T-test results of pre and posttest of experimental group.*

Paired Samples Statistics

Test		Mean	N	Std. Deviation
Pair 1	Pre	7.4000	15	1.49045
	Post	16.2000	15	1.80079

Paired Samples Test				
Test		T	df	Sig. (2-tailed)
Pair 1	pre - post	-17.701	14	0.000

Test of normality of Shapiro-Wilk test was done. Significant values are > 0.05. Hence, both pre and posttest are normally distributed. So, Paired t-test was administered to compare pre and posttest of experimental group. Result shows that the value of t (14) = 17.701, p < 0.05. There is a significant improvement from pretest to posttest, as evident from paired t-test.

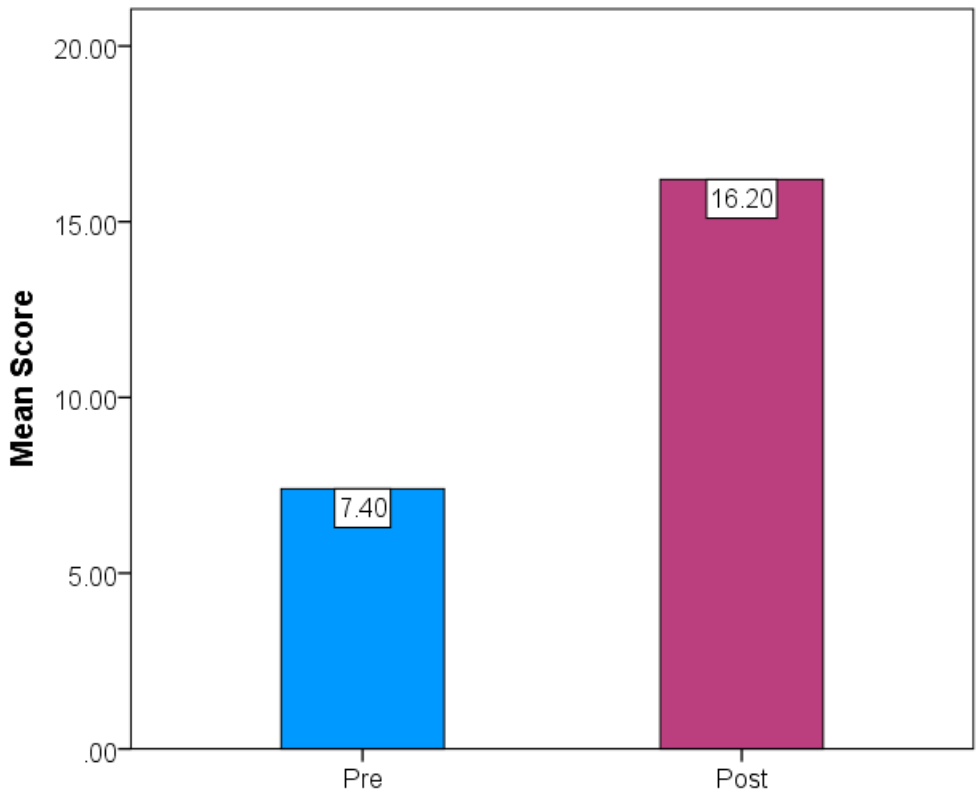

Figure 4.2: Bar graph showing the performances of pre and posttest of experimental group.

After the analysis of scores of control and experimental groups, the both groups were compared to evaluate the effectiveness of teaching learning material in the instructional process. Test of normality, Shapiro- Wilk test was administered. Significant values are > 0.05.Hence, both the pre and posttest were normally distributed. So, paired t-test was administered to compare pre and posttest of control and experimental groups.

Table 4.9: *Independent t-test for the comparison of control and experimental group*

Group statistics

Test	Group	N	Mean	Std. Deviation
Pretest	Experimental group	15	7.4000	1.49045
Pretest	Control group	15	6.7333	1.27988
Posttest	Experimental group	15	16.2000	1.80079
Posttest	Control group	15	7.1000	1.19821

Independent Samples Test

	Test	t	Df	Sig. (2-tailed)
pre	Equal variances assumed	1.314	28	0.199
post	Equal variances assumed	16.294	28	0.000

The above results show that there was a significant improvement in the performance ofexperimental group compared with the control group. This proves the effectiveness ofteaching learning material in the instructional process.

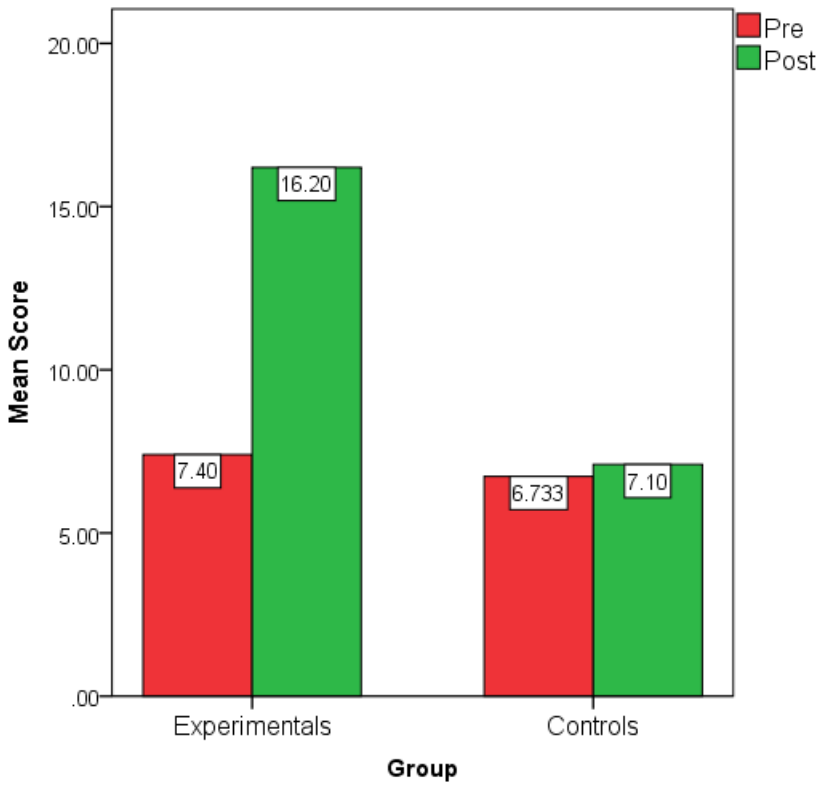

Figure 4.3: Bar graph showing the performances of pre and posttest of experimental and control group.

The above bar diagram contains the results of control and experimental group. This shows that there was an improvement in both the groups. But, experimental group came up with better results compared with the control group. This was due to the effect of teachinglearning material which was used for experimental group in the instructional process of environmental science.

CHAPTER V

SUMMARY AND CONCLUSION

Environmental science is a subject of studying nature. It is very important for each and every student to get the knowledge about the world around us. Environmental science involves an integration of different subject areas like biological sciences, social studies and environmental education. All these concepts may not reach the students effectively, through traditional methods, especially for children with hearing impairment. by keeping this in mind researcher had investigated a research Titled "Effectiveness of Teaching Learning Material in Instruction of Environmental Science to primary school children with Hearing Impairment", with the objectives of to Develop the appropriate teaching learning material for instruction in "food for Health "and to Reinforce the already learnt concepts related to food for health in environmental Science and Studying the efficacy of developed teaching learning materials.

5.1. Selection of subjects and the procedure of Research

The present research contains 30 students as subjects with in the age group of 9 to 11 years. Students were studying 4^{th}class. Researcher had selected students for experimental and control groups with the help of randomization. Students were equally divided into 15 in number in each group. In these groups both children with hearing impairment and typically developing children were involved for the study. After that, a pretest was conducted for the experimental and control group. Researcher had used teaching learning material in the instructional process of environmental science, for 10 sessions with the duration of1 hour. Control group were studied with

the help of traditional methods. At last a post test was conducted with the help of test material for both the group's .i.e. experimental and control groups.

After conducting the posttest, the data which was collected from the pre and posttest were analyzed and compared the results of control group with experimental group, to find out the effectiveness of teaching learning material in instruction of environmental science.

5.2. Major findings of the study

Data analysis revealed that there is an improvement in the post test of experimental groupcompared with control group, this was due to the use of teaching learning material in theinstructional process. The results ofinferential statistics i.e. Normality test, T- test results and the mean scores were better for experimental group compared with control group. This proves that the teaching learning material were effective in teaching instruction.

This result supports the studies ofHoward Gardner (1983), who says that there are eight types of intelligence, which helps them to gain knowledge. Types of intelligence includes

1. Linguistic intelligence
2. Logical-mathematical intelligence
3. Spatial intelligence
4. Bodily-Kinesthetic intelligence
5. Musical intelligence
6. Interpersonal intelligence
7. Intrapersonal intelligence
8. Naturalist intelligence

Howard said that all children are not same. They learn in their own way of style, which differs from one individual to another individual. However, in this present study researcherhad used the different types of materials like charts which act like visual source of information and multimedia which is a source of multiple mode of source like visual as wellas auditory and helps the children to perform better. Researcher also used the real objects and models which helps them as a kinesthetic source and visual source. These materials helpedall students by reaching their different learning styles, through different modalities. It created a stimulated environmentin the teaching learning process.

Therefore these results say that there is a significantimprovement in the performances of experimental group compared with control group.

5.3. Limitations of the study

The following were the limitations of the research

- The researcher was limited to few children with hearing impairment.
- The researcher was limited to few schools.

5.4. Recommendations

The following were the recommendations of the present study

- The study could be carried out on other subjects like mathematics, languages etc.
- The study could be carried out on the other classes.
- The study could be carried out in various schools of various cities.
- The study could be carried out with other communication disabilities.

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APPENDIX I

¥Àæ±Éß¥ÀwæPÉ

(1) PÉ¼ÀV£À ¥Àæ±ÉßUÀ½UÉ GvÀÛj¹. (6 × 1 = 6)

1) ¤ªÀÄä DºÁgÀzÀ°è AiÀiÁªÀ AiÀiÁªÀ ¥ÉÆÃµÀPÁA±ÀUÀ¼ÀÄ EªÉ?

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2) ¤ªÀÄä zÉÃºÀPÉÌ ±ÀQÛ ¤ÃqÀÄªÀ ¥ÉÆÃµÀPÁA±ÀUÀ¼ÀÄ AiÀiÁªÀÅªÀÅ?

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3) £ÀªÀÄä zÉÃºÀPÉÌ R¤eÁA±ÀUÀ½AzÀ DUÀÄªÀ G¥ÀAiÉÆÃUÀUÀ¼ÁªÀÅªÀÅ?

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4) Cw ºÉZÀÄÑ ¤Ãj£ÁA±À ºÉÆA¢gÀÄªÀ AiÀiÁªÀÅzÁzÀgÀÆ MAzÀÄ vÀgÀPÁj ªÀÄvÀÄÛ MAzÀÄ ºÀtÚ£ÀÄß ºÉ¸Àj¸ÀÄ.

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5) PÁ¨ÉÆðºÉÊqÉæÃlÄUÀ¼ÀÄ JAzÀgÉÃ£ÀÄ?

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6) ºÀ¹AiÀiÁVAiÉÄÃ w£Àß§ºÀÄzÁzÀ 2 vÀgÀPÁjUÀ¼À£ÀÄß ºÉ¸Àj¸ÀÄ.

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(2) ©lÖ ¸ÀÜ¼ÀªÀ£ÀÄß vÀÄA©j. (4 × 1 = 4)

1) «l«Ä£ïUÀ¼À£ÀÄß _____ ¨sÁUÀUÀ¼ÁV «AUÀr¸À§ºÀÄzÀÄ.

2) «l«Ä£ï r ¹UÀÄªÀ ªÀÄÆ® _____

3) ¨ÉÃ¼É ªÀÄvÀÄÛ PÁ¼ÀÄUÀ¼À°è _____ EgÀÄvÀÛªÉ.

4) ¨ÉuÉÚAiÀÄ°ègÀÄªÀ ¥ÉÆÃµÀPÁA±À _____

(3) PÁgÀt PÉÆr. (5 × 1 = 5)

1) £ÁªÀÅ Hl ªÀiÁqÀÄªÀ ªÉÆzÀ®Ä PÉÊ PÁ®ÄUÀ¼À£ÀÄß vÉÆ¼ÉAiÀÄ¨ÉÃPÀÄ.

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2) PÉ®ªÀÅ vÀgÀPÁjUÀ¼À£ÀÄß ºÀ¹AiÀiÁVAiÉÄÃ w£ÀßÉÃPÀÄ.

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3) £ÀªÀÄä HlzÀ°è £Áj£ÁA±À«gÀÉÃPÀÄ.

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4) £ÁªÀÅ ¸ÀªÀÄvÉÆÃ®£À DºÁgÀªÀ£ÀÄß ¸ÉÃ«¸ÉÃPÀÄ.

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5) £ÁªÀÅ ¥Àæw¢£À £Á®ÄÌ ¯ÉÆÃl ¤ÃgÀÄ PÀÄrAiÀÄ¯ÉÃ¨ÉÃPÀÄ.

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(4) ºÉÆA¢¹ §gÉ¬Äj. **(5 ×1 = 5)**

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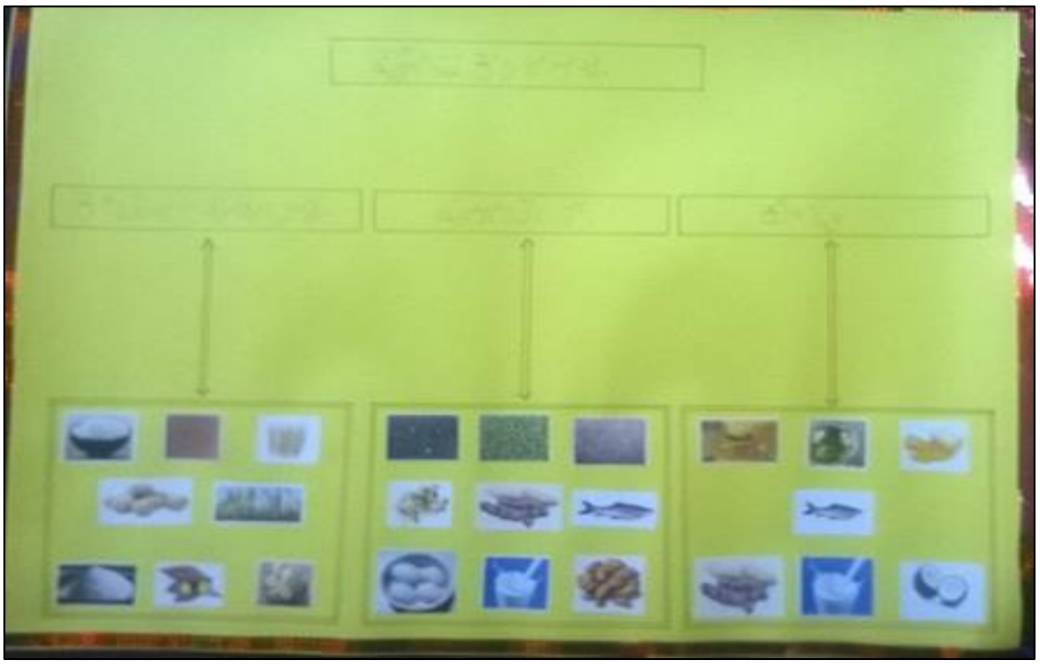
APPENDIX II
TEACHING LEARNING MATERIAL



విటమిన్ ఎ	ఆరోగ్యకరమైన చర్మం మరియు కళ్ళు	ఇరుకుగుళ్లు
విటమిన్ బి	ఆరోగ్యకరమైన చర్మం మరియు హృదయం	బేరి బేరి
విటమిన్ సి	రోగనిరోధక మానవ దేహమును రక్షిస్తాయి	స్కర్వీ
విటమిన్ డి	ఎముకలు మరియు దంతాలు	రికెట్స