

CHAPTER IV

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.0.0 INTRODUCTION

The present chapter deals with the analysis and interpretation of collected data. Any raw data does not provide any answer. It has to be analyzed first and then interpreted. For this, identification of appropriate analysis techniques is extremely important. An analysis helps the data to be reduced in understandable and interpretable form. Its basic purpose was to summarize the complete observations in such a manner that they yield answers to the research problems and the purpose of interpretation was to search for broader meaning of these answers. Thus, data analysis and interpretation become an important aspect of research.

As it is a quasi experimental study, the data analysis for the present study was done both quantitatively and qualitatively. The quantitative analysis was done with the help of both descriptive statistics and non-parametric statistics. The descriptive statistical techniques like, mean, standard deviation, standard error of mean, Intensity Index and for the non-parametric statistics, Mann-Whitney U-test were used during the process of the data analysis. The researcher preferred to use Mann-Whitney U-test as the sample was taken purposively and the assumptions of parametric statistics did not match for the present data. The calculation was done using below mentioned formulas:

$$U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - \sum R_1$$

n_1 = number in one group $\sum R_1$ = sum of ranks in one group

n_2 = number in second group

The z-value of U can be determined by the formula:

$$z = \frac{U - \frac{n_1 n_2}{2}}{\sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}}$$

4.1.0 ACHIEVEMENT IN ENGLISH OF EXPERIMENTAL AND CONTROL GROUP

To achieve objective 2 of the present study i.e. 'To study the effectiveness of the developed teaching learning material in terms of students' achievement in English.' and to test the null hypothesis of the present study i.e. 'There will be no significant difference between the mean post-test achievement scores of standard VIII students studying English through teaching learning material and those studying through traditional method', data were analyzed using Mean, Standard Deviation and Mann-Whitney U-test which is given and discussed in table 4.1 and table 4.2.

Table 4.1: Mean, Standard Deviation and Standard Error of Mean wise distribution of Achievement in English of Experimental and control group Students

Group	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	30	12.05	4.87	0.90
Experimental Group	30	20.83	4.01	0.74

From the table 4.1, it was found that the mean English achievement score of control group and the experimental group were 12.05 and 20.83 respectively. The standard deviations from the means for the English achievement score were found to be 4.87 and 4.01 respectively for the control group and the experimental group students with Standard Error of Means of 0.90 and 0.74 for the respective groups. Comparing the mean achievement scores in English it was found that the Mean of the Experimental Group was higher than that of the Control Group. From the Standard Deviations and Standard Error of Means of both the groups, it was also observed that the students of the Experimental Group were more homogeneous in terms of their achievement score in comparison to the students of the Control Group. To find whether the difference in the mean achievement was significant or by chance and to test the null hypothesis, Mann-Whitney U-test was used as the sample was taken purposively. The summary of the Mann-Whitney U-test is given in table 4.2 followed by analysis.

Table 4.2: Summary of Mann-Whitney U-test for English Achievement of Experimental and Control group students with the Number of sample, Sum of Ranks, U-value, z-value and Probability

Group	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	30	539.08	825.92	5.56	0.00003
Experimental Group	30	1279.89			

From table 4.2, it was observed that the Sum of Ranks of the control group and the experimental group were 539.08 and 1279.89 respectively with 30 students in both the groups. The U-value and z-value were found to be 825.92 and 5.56 respectively. Referring Table for normal probability (Table A of Siegel, 1956) under null hypothesis (H_0) of z, for $z < 5.56$, the two tailed probability was found to be 0.00003 which is greater than our decided significance level (α) i.e. 0.01. Hence the null hypothesis i.e. 'There will be no significant difference between the mean post-test achievement scores of standard VIII students studying English through teaching learning material and those studying through traditional method' is rejected and it can be said that experimental group and control group students differ stochastically in terms of their achievement in English. From table 4.1 it was also found that the mean achievement of experimental group in English is more than the mean achievement of control group in English which is due to teaching English using teaching learning material. Hence it showed that the developed teaching learning material for teaching English is effective in enhancing achievement of students in comparison to traditional approach. So it can be concluded that the developed teaching learning material was found to be stochastically (significantly) effective in terms of enhancing students' achievement in English in comparison to the traditional approach.

4.2.0 EFFECTIVENESS OF THE DEVELOPED TEACHING LEARNING MATERIAL IN TERMS OF STUDENTS' REACTION

To achieve objective 3 of the present study i.e. 'To study the effectiveness of the developed teaching learning material in terms of students' reaction.' A reaction scale was developed with 20 statements. It is given in appendix II. The data related to the reaction scale is analyzed in terms of numbers and percentage of reaction for

different degree along with the intensity index which is given in table 4.3 and followed by discussion.

Table 4.3: Summary of the Reactions of the Students towards the Statements related to the Developed TLM in Frequency, percentage and Intensity Index

Sr.No.	Statement	Yes	I don't know	No	II
1.	I like the learning with TLM mn[TLM siY[S)Kvin&> gÅy&>.	30 (100)	00 (0)	00 (0)	3
2.	TLM helped me in better understanding of the given points. aip[li m&Niai[n[sir) r)t[smjvimi> TLM a[mn[mdd kr).	30 (100)	00 (0)	00 (0)	3
3.	The pictures used in TLM helped me in understanding the difficult words. TLMni (c#ii[a[aGri S¾4di[smjvimi> mn[mdd kr).	30 (100)	00 (0)	00 (0)	3
4.	The activities used in TLM helped me in doing the drill work more effectively. TLMn) p\ vZ(_iai[a[mn[asrkirk r)t[ØQ)krN krvimi> mdd kr).	15 (50)	13 (43.33)	02 (6.67)	2.4
5.	TLM inspired me to work in group. TLMY) gZpmi> kim krvin) mn[p[rNi mL).	25 (83.33)	03 (10)	02 (6.67)	2.8
6.	TLM helped me in understanding the Units of the textbook easily. piqyp&Atkni y&(nT smjvimi> mn[TLMY) mdd mL).	30 (100)	00 (0)	00 (0)	3
7.	TLM helped me in understanding the grammatical points effectively. gi mrni m&Ni asrkirk r)t[smjvimi> mn[TLMa[mdd kr).	26 (86.67)	02 (6.67)	02 (6.67)	2.8
8.	TLM helped me in developing listening skill. si>BLvin&> ki]]SÃy (vksivvimi> TLMa[mn[mdd kr).	23 (76.67)	02 (6.67)	05 (16.17)	2.6
9.	TLM helped me in developing speaking skill. bi[lvin&> ki]]SÃy (vksivvimi> TLMa[mn[mdd kr).	29 (96.67)	01 (3.33)	00 (0)	2.96
10.	TLM helped me in developing reading skill. vi>cvin&> ki]]SÃy (vksivvimi> TLMa[mn[mdd kr).	29 (96.67)	01 (3.33)	00 (0)	2.96

Sr.No.	Statement	Yes	I don't know	No	II
11.	TLM helped me in developing writing skill. Kvin&> &> ki]]SĀy (vksivvimi> TLMa[mn[mdd kr).	29 (96.67)	00 (0)	01 (3.33)	2.93
12.	TLM gave me the opportunity to work when I like. h&> eμC&> Ryr[kim krvin) tk TLMa[mn[aip).	26 (86.67)	02 (6.67)	02 (6.67)	2.8
13.	The test after every unit gave me the chance to test my preparation. dr[k y&(nT pC) T[ATn[kirN[mn[mir) t]]yir) ckisvin) tk mL).	22 (73.33)	04 (13.33)	04 (13.33)	2.6
14.	The TLM gave me the opportunity to improve my ability according to my pace. TLMa[mn[mir) S(kt an&sir mir) xmtiai[(vksivvin) tk p&r) piD).	28 (93.33)	01 (3.33)	01 (3.33)	2.9
15.	The TLM helped me in preparing myself for the examination. pr)xin) t]]yir) krvimi> TLMY) mn[mdd mL).	30 (100)	00 (0)	00 (0)	3
16.	The TLM gave me the chance of extra reading of relating topics. s>b>(Ft m&Ñiai[s>dB[< vFirin&> vi>cn krvin) tk TLMa[mn[aip).	27 (90)	03 (10)	00 (0)	2.9
17.	The TLM gave me the opportunity to help my classmates. miri shpiq)ai[n[mdd krvin) tk TLMa[mn[aip).	29 (96.67)	01 (3.33)	00 (0)	2.96
18.	The TLM gave me the chance to take the help of other friends. miri shpiq)ai[Y) mdd l[vin) tk TLMa[mn[aip).	26 (86.67)	02 (6.67)	02 (6.67)	2.8
19.	The TLM inspired me to understand the topic in detail. m&Ñiai[n[U>DiNY) smjvimi> TLMY) mn[p[i[Rsihn mÇy&>.	21 (70)	06 (20)	03 (10)	2.6
20.	I enjoyed the learning with TLM. TLM siY[BNvin) mn[mji aiv).	30 (100)	00 (0)	00 (0)	3
	Overall Reaction				2.8

Figure in the bracket is percentage of response. II- Intensity Index

In terms of the reaction of the students towards the statement 'I like the learning with teaching learning material', all the 30 students said 'yes'. It means 100% students were in the favour of the statement. The intensity index of 3 revealed that all of the students were in favour of the statement and they liked the learning with teaching learning material.

For the statement 'Teaching learning material helped me in better understanding of the given points', all the 30 students gave their reaction in 'yes'. It indicates that 100% students were in the favour of the statement. The intensity index of 3 showed the positive reactions of all the students for the given statement. Hence, it can be said that teaching learning material helped students for better understanding of the teaching points.

In terms of the reaction of the students towards the statement 'The pictures used in teaching learning material helped me in understanding the difficult words', all the 30 students said 'yes'. It means 100% students were in the favour of the statement. The intensity index 3 revealed that all of the students were in favour of the statement. Thus, it can be said that the pictures used in the teaching learning material helped the students in understanding difficult words.

For the statement 'The activities used in teaching learning material helped me in doing the drill work more effectively', 15 students said 'yes', 13 said 'I don't know' and two students said 'no'. This suggests that 50% students were in favour of the statement, 43.33% could not decide anything and 6.67% students were against of the statement. The intensity index 2.43 showed that most of the students were in favour of the statement. Hence, it is cleared that most of the students thought that teaching learning material helped them in doing the drill work more effectively.

In terms of the reaction of the students towards the statement 'Teaching learning material inspired me to work in group', 25 students said 'yes', three students said 'I don't know' and two students said 'no'. This suggests that 83.33% students were agree with the statement while 10% students replied 'I don't know' and 6.67% students said 'no'. The intensity index 2.8 showed that most of the students were in

favour of the statement and teaching learning material inspired the students to work in a group.

For the statement 'Teaching learning material helped me in understanding the Units of the textbook easily', all of the students gave their reaction in 'yes'. It indicates that 100% students were in the favour of the statement. The intensity index 3 showed the positive reactions of all the students for the given statement. So, it can be said that teaching learning material helped the students in understanding the units easily.

In terms of the reaction of the students towards the statement 'Teaching learning material helped me in understanding the grammatical points effectively', 26 students said 'yes', two students said 'I don't know' and two students said 'no'. This shows that 86.67% students were agree with the statement while 6.67% students replied 'I don't know' and 6.67% students said 'no'. The intensity index 2.8 showed that most of the students were in favour of the statement. Thus one can say that teaching learning material helped the students in understanding the grammatical points effectively.

For the statement 'Teaching learning material helped me in developing listening skill', 23 students gave their reaction in 'yes', two said 'I don't know' and five students said 'no'. This suggests that 76.67% students were agree with the statement while 6.67% students replied 'I don't know' and 16.17% students said 'no'. The intensity index 2.6 showed the positive reactions from the most of the students for the given statement. Hence, it can be said that teaching learning material helped the students in developing listening skill.

In terms of the reaction of the students towards the statement 'Teaching learning material helped me in developing speaking skill', 29 students said 'yes' and one student said 'I don't know'. It indicates that 96.67% students were in favour of the statement while 3.33% students replied 'I don't know'. The intensity index 2.96 showed that most of the students were in favour of the statement. Thus, one can say that teaching learning material help[ed] the students in developing speaking skill.

For the statement 'Teaching learning material helped me developing reading skill', 29 students gave their reaction in 'yes' and said 'I don't know'. It suggests that 96.67% students were in favour of the statement while 3.33% students replied 'no'. The intensity index 2.96 revealed positive reactions of most of the students for the given statement. So, it can be said that teaching learning material helped the students in developing reading skill.

In terms of the reaction of the students towards the statement 'Teaching learning material helped me in developing writing skill', 29 students said 'yes' and one student said 'no'. It shows that 96.67% students were in favour of the statement while 3.33% students replied 'no'. The intensity index 2.93 showed that most of the students were in favour of the statement and teaching learning material helped the students in developing writing skill.

For the statement 'Teaching learning material gave me the opportunity to work when I like', 26 students gave their reaction in 'yes', two students said 'I don't know' and two students said 'no'. This suggests that 86.67% students were agree with the statement while 6.67% students replied 'I don't know' and 6.67% students said 'no'. The intensity index 2.8 revealed positive reactions of most of the students for the given statement. Hence, it can be said that teaching learning material gave the students opportunities to work when they like.

In terms of the reaction of the students towards the statement 'The test after every unit gave me the chance to test my preparation', 22 students said 'yes', four students said 'I don't know' and four students said 'no'. This indicates that 73.33% students were agree with the statement while 13.33% students replied 'I don't know' and 13.33% students said 'no'. The intensity index 2.6 showed that most of the students were in favour of the statement and they believe that the test after every unit gave them the chance to test their preparation.

For the statement 'Teaching learning material gave me the opportunity to improve my ability according to my pace', 28 students gave their reaction in 'yes', one student said 'I don't know' and one student said 'no'. that 93.33% students were agree with the statement while 3.33% students replied 'I don't know' and 3.33%

students said 'no'. The intensity index 2.9 revealed positive reactions of most of the students for the given statement. So, one can say that teaching learning material gave the students the opportunities to improve their ability according their pace.

In terms of the reaction of the students towards the statement 'The teaching learning material helped me in preparing myself for the examination', all the 30 students said 'yes'. This indicates that 100% students were in favour of the statement. The intensity index 3 revealed that all of the students were in favour of the statement. Thus, it can be said that teaching learning material helped the students in preparing themselves for the examination.

For the statement 'The teaching learning material gave me the chance of extra reading of relating topics', 27 students gave their reaction in 'yes' and three students said 'I don't know'. It shows that 90% students believed in the statement while 10% students replied that they don't know. The intensity index 2.9 revealed positive reactions of most of the students for the given statement. So, one can know that the teaching learning material gave the students the chance of extra reading of relating topics.

In terms of the reaction of the students towards the statement 'The teaching learning material gave me the opportunity to help my classmates', 29 students said 'yes', and one student said 'I don't know'. This indicates that 96.67% students were agreed with the statement while 3.33% students could not say anything. The intensity index 2.96 showed that most of the students were in favour of the statement and they believed that the teaching learning material gave them the opportunity to help their classmates.

For the statement 'The teaching learning material gave me the chance to take the help of other friends', 26 students gave their reaction in 'yes', two students said 'I don't know' and two students said 'no'. This suggests that 86.67% students were agree with the statement while 6.67% students could not give any reaction and 6.67% students were not agree with the statement. The intensity index 2.8 revealed positive reactions of most of the students for the given statement and so, it can be said that

teaching learning material gave the students the chance to take the help of their friends.

In terms of the reaction of the students towards the statement 'The teaching learning material inspired me to understand the topic in detail', 21 students said 'yes', six students said 'I don't know' and three students said 'no'. This indicates that 70% students were agreed with the statement while 20% students could not give any decision and 10% students were not in the favour of the statement. The intensity index 2.6 showed that most of the students were in favour of the statement. Hence, one can say that teaching learning material gave inspiration to the students to understand the topic in detail.

For the statement 'I enjoyed the learning with teaching learning material', all the 30 students gave their reaction in 'yes'. It means 100% students were in the favour of the statement. The intensity index 3 showed the positive reactions of all the students for the given statement and all the students enjoyed the learning with teaching learning material.

In terms of the overall reaction of the students towards the teaching learning material, the intensity index was found to be 2.85. It shows that most of the students had favourable reaction towards the teaching learning material. Hence, it can be said that most of the students found the teaching learning material favourable, componentwise and as a whole.

Out of 20 statements in the reaction scale that describes different aspects of the developed teaching learning material, students had favourable reaction for almost all the 20 statements. The overall reaction of the students towards the teaching learning material was also found to be favorable. Hence, it can be concluded that students have favorable reaction towards the teaching learning material through which they learned the English. So it can be observed that teaching learning material was found to be effective to teach English in terms of the reaction of students towards the teaching learning material.

4.3.0 OBSERVATIONS DURING THE EXPERIMENT

During the experiment, the researcher keenly observed the behavior of students related to the learning of English with the help of teaching learning material. Some of the main observations were as follows.

- Students were found very active while learning through teaching learning material. This indicates that they liked to learn with teaching learning material.
- During the experiment it was found that students were helping each other while interacting with the teaching learning material. The researcher noticed that the students were discussing their problems with their friends and trying to understand the concept by themselves. They were found working in small groups. It indicates that learning with teaching learning material inspired the students to work in group and to have cooperative learning.
- It was also noticed that most of the students went through the material several times. This showed that teaching learning material inspired the students to revise the points properly.
- Most of the students were found interested in pictures, games and different exercises given in the teaching learning material. With the help of pictures, they tried to find out the meanings of the given words easily.
- Students were found comparing teaching learning material with their text-book, particularly, while learning the unit 4 i.e. Bamboo – The Wonderful Plant. They enjoyed the comparison of teaching learning material and the text book. They tried to find out the meanings of the words that were given in the unit by taking the help of pictures and the word meaning given in different boxes in teaching learning material.
- It was noticed that the students were using teaching learning material whenever they were found themselves free. In this way, the students got the advantages of using teaching learning material as a self learning material.

- The students were found approaching the teacher (researcher) while learning with the teaching learning material. They also showed the teachers the way they had completed the exercises and expressed their feelings about the pictures, exercise or game they like. They also expressed their positive feelings about the extra reading material related to the text book to teach English.
- It was also found that the students were learning with the help of teaching learning material even after the school at the hostel.
- The students were tried to prepare themselves for the unit test with the help of teaching learning material. They were also found very much eager to know their result. In case of poor result, they were found referring the teaching learning material again and again to learn more related to their unit tests.
- The overall observation of the researcher shows that the students were enjoying the learning with teaching learning material.

4.4.0 MAJOR FINDINGS OF THE STUDY

Following Major findings were drawn for the present study on the basis of analysis and interpretation of the data.

1. The developed teaching learning material was found to be stochastically (significantly) effective in terms of enhancing students' achievement in English in comparison to the traditional approach.
2. The developed teaching learning material to teach English was also found to be effective in terms of the reaction of students towards the package.
3. The developed teaching learning material was found to make the students interested in learning English, having cooperative learning among students and considering the teaching learning material as a self study material.

4.5.0 DISCUSSION

Supplementary reading material has a great role in the teaching learning process and it is very much important for the weaker section of the students like ST,

SC and other backward class students studying in the government schools. Only text-book is not enough to satisfy the needs of these students. They need some supportive material for understanding their text content due to one or other reason. It is again more difficult for these students to understand English subject which is introduced in the schools in the later stages like after standard V in many states. The condition of teaching learning of English in Adarsh Nivasi Schools for ST is quite deplorable and considering the need of additional teaching learning material the researcher developed teaching learning material for the standard VIII students of Adarsh Nivasi Schools for ST and tried to make use of the developed teaching learning material for teaching – learning process and tried to measure the effectiveness of the teaching learning material for enhancing achievement in English. Studies conducted by Dubey (1990), Sevak (1993), and Panchal (2006) proved that supporting materials like self learning material can be used to enhance the achievement of students in different subjects. In all those study it was found out that the learning with self learning material was found better than learning with traditional method in terms of enhancing the achievement of students. The present study is an attempt in this direction to teach English through teaching learning material. The Major findings of the present study state that the developed teaching learning material was found to be stochastically (significantly) effective in terms of enhancing students' achievement in English in comparison to the traditional approach and the developed teaching learning material to teach English was also found to be effective in terms of the reaction of students towards the material. Study conducted by Gabrielle (2003), Zyud (1997) supports the findings of the present study and shows that systematically designed instructional strategies can positively affect motivation performance, and self directed learning of the students. Floyed (2006) also shows the findings in line with the present study as it shows that the use of technology has positive effect on students' achievement as it increases students' achievements. Besides the above studies which support the findings of the present study, there are studies which contrast the findings of the present study. They are the studies conducted by Sabharwal(1978), Charsky (2004). Both the studies aimed to check the effectiveness of programmed auto learning vis-à-vis other methods, and it was found that the grammar translation method and the bilingual methods were more effective than the programme learning. This could be a fact due to the type of programme learning materials prepared in the past. The type of teaching

learning material which is prepared in present time include the need based learning material which is quite suitable for the rural set up where the availability of high end technology is quite limited. The present teaching learning material take care of providing more pre-learning activities which is quite essential to prepare a foundation for the current learning of English. That may be the cause of better result of experimental group in the present study.

The findings of the present study showed that the developed teaching learning material was more effective than the traditional method of teaching in terms of achievement of students in English. It may be due to the fact that the teaching through traditional method does not take care of needed foundation of students in English and the required context needed for better understanding of English by the students and students are only the passive listeners in the traditional classroom teaching. Other reason can be that the students have to learn whatever the teacher teaches to them in the class, though they are interested or not but here the developed teaching learning material has many features like, pictures, puzzles, games and activities related to them. The students might have made use of their understanding as well as their imagination, experiences through the co ordination of the learnt things with different contexts. The other benefit was that the students could learn the topic of their own interest taking the teaching learning material as the self learning material which might have helped for better learning. Thus the overall effect of the teaching learning material in comparison to traditional method was found to be more effective.

The reactions of the students were also found favorable towards the teaching learning material. The reasons behind that may be the difference in teaching – learning process itself, the colourful pictures, relevance of the pictures with their lives, usability of the learnt topics in life through pictures and structures, freedom of learning, puzzles, games, activities and clarity of explanation presented in the teaching learning material. Even the students of this level like the wholistic nature of the content which might have developed their liking for the developed teaching learning material.

4.6.0 CONCLUSION

The developed teaching learning material to teach English to standard VIII students of Adarsha Nivashi Schools for ST was found to be effective in enhancing achievement of students in English in comparison to the traditional method of teaching. The teaching learning material was also found effective in terms of the liking of students towards the material that was revealed form of technology for the teaching of English. This technology has huge potential today as many schools managed by different government agencies which work for the upliftment of the weaker section of the society are not provided with high end technologies like computer hardware and software and also facing the problem of electricity. Now many private publishers are coming up with this type of teaching learning material mainly for CBSE and ICSE syllabus where the cost of these books like teaching learning material are quite costly and cannot be affordable to the children of these weaker section people of the society. Now there is a need to prepare such type of teaching learning material in different subjects by the government agencies in a cost effective manner to cater the need of these students studying in different schools. While preparing this type of teaching learning material there is a need to consider the level of the students, their environment and the likeness. According to the learning style of these learners, different teaching learning material could be available to these learners for excelling in different subjects. This technology blended learning will see the better future of students by the way of providing equity measures to these weaker section students to make them equal in the society.