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CHAPTER V

SUMMARY OF FINDINGS

V.1. Introduction

Research begins when there is a problem, either the researcher himself / herself identifies the problem or the problem is passed to him /her by others. According to Clifford Woody, “Research Comprises defining and redefining problems, formulating hypotheses and collecting or gaining and evaluating data.”

In each and every research the final stage is hypothesis testing. It is the duty of the investigator to report the finding after evaluating the hypotheses for future findings and suggestions.

So in this chapter, the summary of the findings, suggestions for further research and conclusion are presented.

V.2. Need for the Study

The present age is called the age of science and technology. Mathematics is one of the branches of Science. A wise teacher always uses aids to make his teaching effective, concrete and interesting. Teaching of Mathematics can be made interesting and effective with the help of the teaching aids.

The present generation has realized the importance and due to this the demand for education is increasing rapidly with a view to bringing
innate potentialities of the child. Various attempts are also being made to provide the right type of experience for the all round and harmonious development of the child. In fact the teachers play a major role in bringing out the potentialities of the child. 1986 National Policy of Education emphases the child-centered education, experience based on teaching, learning as joyful experience, activity based teaching etc. To implement these strategies, they have followed the operational black board scheme and minimum level of learning approach, moreover to improve our more and more visual aids must be used in our classroom. Hence the teacher should know the importance of the utilization of visual aids to motivate learner to bring novelty in the classroom and to the student meaningful experience etc. Keeping all those facts in mind and the realization of immense potentialities of visual aids for successful and effective teaching in our schools has prompted, the investigator takes a close look at the availability and utilization of the more important visual aids. The teacher has to employ these material aids with caution. He/She should keep in mind, the psychophysical requirements of the students. Material aids should be used sparingly of course keeping in view the requirements of the subject matter. The use of these material aids are necessary for teaching of Mathematics.

Mathematics occupies an important place. In most of the states of our country, Mathematics is taught as a compulsory subject upto high school level.
Every occupation in this world even a pottery, carpentry, sweet making is guided by Mathematics. When a farmer throws a stone to device away the birds eating his fruit, if one stone misses he can easily try another. But the throwing of Apollos in space to reach the moon could not be such a simple hit or miss. The multimillion dollar project is not as simple to lose as a stone. In this case right amount of thrust in rockets accurately in time an angle to launching shape to provide minimum friction etc. were required. How to get these values lies in the domain of higher mathematics.

In the present social setup Mathematics is very much important for the common men only a person with good Mathematical background can be reasonably sure to that he is getting his education.

Inspite of the facts discussed so far, more number of failures at school level is in Mathematics. It is the next only to English in failure. One of the important reasons is that the subject has not been understood properly. It is mainly because of poor teaching methods and the lack of use of audio-visual aids.

Many studies have been undertaken to find out the effectiveness of Educational Technology on teaching in general and teaching of Mathematics in particular. But the study on the uses of Educational Technology has not been done, so deeply, so far, in the schools coming under Bharathidasan University Jurisdiction as far as the researcher is concerned. Thus is the need for this study.
V.3. Statement of the Problem

The dissertation is stated as "Application of Educational Technology in Teaching of Mathematics at Secondary School level in Bharathidasan University Jurisdiction".

V.4. Scope and Contribution of the Study

The scope of educational technology depends upon in what context the term educational technology is used as the Audio-Visual Aids, mechanical and electric gadgets, the scope is limited to improve the educational messages.

If the term Educational Technology is used as the process oriented technique then its scope is limited to production of teaching, learning material. The vigorous task analysis specification of direct behaviour, the determination of pre-requisites and the gradual development of the programme ensure that the teaching learning material developed on this style will be most useful to the learner. Thus basically the technique of developing software and organization of man-material resources are born for specific objectives. This covers both planning as well as implementation phases and is the most accepted concept all over the world.

The result of this study will throw more light on the means to the problem of poor achievement in Mathematics at high school level which will help us to evolve suitable strategies for optimum utilization of available technology in schools.
V.5. Variables Selected for the Study

V.5.a. Institutional variables selected for the study

1. Type of Schools (Boys / Girls / Co-education)
2. Location of the institution (Rural / Urban)
3. Nature of the Institution (Govt. / Aided)
4. Language of Instruction (Tamil / Tamil and English)

V.5.b. Teacher variables selected for the study

1. Sex (Male / Female)
2. Age (Above 35 years / 35 and below 35 years)
3. Educational Qualification (Post Graduate / Under Graduate)
4. Years of Teaching experience (Above 15 years / 15 and below 15 years)

V.5.c. Variables with reference to the application of Educational Technology

1. Availability of Educational Technology
2. Utilization of Educational Technology
3. Working Knowledge in handling Educational Technological Aids
4. Teacher attitude towards utilization of Educational Technological Aids
V.6. Objectives of the Study

The following objectives were framed

1. To find out the availability of Educational Technology at Secondary School level in Bharathidasan University Jurisdiction for Teaching of Mathematics.

2. To find out the utilization of Educational Technology for teaching Mathematics at Secondary School level in Bharathidasan University Jurisdiction.

3. To find out the Working Knowledge of B.T. Assistants of Mathematics in handling Educational Technological Aids.

4. To know the attitude of B.T. Assistants of Mathematics towards the application of Educational Technology for teaching of Mathematics at Secondary School level in Bharathidasan University Jurisdiction.

5. To find out the relationship between the Availability of Educational Technology and the Institutional variables such as
   (i) Type of school
   (ii) Locality
   (iii) Nature of Institution
   (iv) Language of instruction followed in the school

6. To find out the relationship between the Utilization of Educational Technology and Institutional variables such as
   (i) Type of school
   (ii) Locality
   (iii) Nature of Institution
   (iv) Language of instruction followed in the school
7. To find out the relationship between the Utilization of Educational Technology and Teacher variables such as
   (i) Sex
   (ii) Age
   (iii) Educational qualification
   (iv) Teaching experience

8. To find out the relationship between the Working Knowledge of the teachers and the following teacher variables such as
   (i) Sex
   (ii) Age
   (iii) Educational qualification
   (iv) Teaching experience

9. To find out the relationship between Attitude of teachers towards the application of Educational Technology and the following teacher variables such as
   (i) Sex
   (ii) Age
   (iii) Educational qualification
   (iv) Teaching experience

V.7. Hypotheses of the Study

1. Educational Technology is not available at Secondary School level in the Educational Districts of Bharathidasan University Jurisdiction for teaching of Mathematics.
2. Educational Technology is not properly utilized for teaching of Mathematics at Secondary School level in the Educational Districts of Bharathidasan University Jurisdiction.

3. The B.T. Assistants of Mathematics in Bharathidasan University Jurisdiction are not having Working Knowledge in handling Educational Technological Aids for teaching of Mathematics.

4. The B.T. Assistants of Mathematics in Bharathidasan University Jurisdiction are not having positive attitude towards the application of Educational Technological Aids.

5. There is no significant relationship between the Availability of Educational Technology and Institutional variables such as
   (i) Type of school
   (ii) Locality
   (iii) Nature of Institution
   (iv) Language of instruction followed in the school

6. There is no significant relationship between the Utilization of Educational Technology and Institutional variables such as
   (i) Type of school
   (ii) Locality
   (iii) Nature of Institution
   (iv) Language of instruction followed in the school

7. There is no significant relationship between the Utilization of Educational Technology and Teacher variables such as
   (i) Sex
   (ii) Age
(iii) Educational qualification
(iv) Teaching experience

8. There is no significant relationship between the Working Knowledge of teachers in handling Educational Technological Aids and the following Teacher variables such as
(i) Sex
(ii) Age
(iii) Educational qualification
(iv) Teaching experience

9. There is no significant relationship between the Attitude of teachers towards the application of Educational Technological Aids and the following Teacher variables such as
(i) Sex
(ii) Age
(iii) Educational qualification
(iv) Teaching experience

V.8. Methodology

V.8.a. Sample

There are 8 educational districts in the Bharathidasan University jurisdiction. They are (1) Thanjavur educational district, (2) Pattukkottai educational district, (3) Thiruvarur educational district, (4) Nagapattinam educational district, (5) Pudukkottai educational district, (6) Karur educational district, (7) Perambalur educational district and (8) Tiruchirapalli educational district. There are 911 high and higher secondary schools in the Educational Districts of Bharathidasan
University Jurisdiction. 372 schools were selected for the present study by using random sampling technique. One Mathematics B.T. Assistant from each school was requested to respond the questionnaire. Thus, stratified random sampling technique has been adopted in this study.

V.8.b. Methodology in Brief

All the high and higher secondary schools in the Bharathidasan University Jurisdiction have been selected for this study. One questionnaire was sent to each school. The teachers from 372 out of 911 schools have responded. The data thus collected were put into appropriate statistical analysis.

V.8.c. Tools Used

The questionnaire prepared and developed by the investigator and her guide was used to collect the data in this study.

V.8.d. Statistical Techniques Applied

To find out the relationship between the selected variables and the application of Educational Technology, Chi-Square test was applied and the data were analysed.

V.9. Limitation

1. The study was limited to 372 schools in Educational districts of Bharathidasan University Jurisdiction.

2. Availability, utilization, working knowledge and interest and attitude of the school teachers only were measured by using the tool developed by the investigator for the purpose.
3. Only one teacher from each school has been asked to respond the questionnaire.

4. The study was limited to the government and aided schools of Bharathidasan University jurisdiction, Educational districts of Tamil Nadu.

V.10. Findings of the Study

The findings of the study are given below:

Hypothesis-1

Availability of Educational Technology for teaching of Mathematics at Secondary School level of Bharathidasan University Jurisdiction is not adequate.

Statistical Techniques Used : Rectangular Histogram
Variables Analysed : Availability of Educational Technology in the secondary schools in the Educational Districts of Bharathidasan University Jurisdiction

Result: 1

Black board is available in 100 per cent of schools. Instrument box is available in 99 per cent of schools. Radio is available in 80 per cent of schools. Tape Recorder is available in 77 per cent of schools. Workbooks are available in 70 per cent of schools. Televisions are available in 68 per cent of schools. Diagrams are available in 67 per cent of schools. Graph boards and News Paper cuttings are available in 61 per
cent of schools. Ink Duplicator, Measuring Instrument, Album, Magazines and Typewriter are available in below 50 per cent of schools. Computers are available in 45 per cent of schools. Journals are available in 38 per cent of schools. Display board, Bulletin board, Flash cards, Geo board, Museum, Slide Projector, Over Head Projector and VCR are available in below 30 per cent of schools. Flannel board, Peg board, Glass board, Rolling board, Matching cards, Filmstrip Projector, Epidiascope, Video Camera and Xerox Machine are available in below 20 per cent of schools. Magnetic board, Educational Video Games, Transparencies, Film Projector and Micro Computer are available in below 10 per cent of schools.

**Hypothesis-2**

Educational Technology is not properly utilized for teaching of Mathematics at Secondary School level in the Educational Districts of Bharathidasan University Jurisdiction.

**Statistical Techniques Used** : Rectangular Histogram

**Variables Analysed** : Utilization of Educational Technology

**Result: 2**

100 per cent of schools are utilizing Black board. 99 per cent of schools are utilizing Instrument box. 86 per cent of schools are utilizing Radio and Graph board. 80 per cent of schools are utilizing Charts. 78 per cent of schools are utilizing Tape Recorder. 75 per cent of schools are utilizing Diagrams. 70 per cent of schools are utilizing Graph board. 69
per cent of schools are utilizing Workbooks. 62 per cent of schools are utilizing Television. 52 per cent and 51 per cent of schools are utilizing Magazines, Models and Measuring Instrument respectively. 48, 42 and 41 per cent of schools are utilizing Typewriter, Computer and Journals respectively. Below 30 per cent of schools are utilizing Display board, Bulletin board, Flash cards, Matching cards, Geo board, Museum, O.H.P., VCR., Xerox Machine and Ink Duplicator. Below 20 per cent of schools are utilizing Flannel board and Rotating Discs. Below 10 per cent of schools are utilizing Peg board, Micro Computer, Internet, Satellite and Floppies.

**Hypothesis: 3**

The B.T. Assistants of Mathematics in Bharathidasan University Jurisdiction are not having adequate Working Knowledge in handling Educational Technological Aids for teaching of Mathematics.

**Statistical Techniques Used** : Rectangular Histogram  

**Result: 3**

100 per cent of Mathematics Teachers are having Working Knowledge about Black board, Instrument box, Radio and Tape Recorder. 98 per cent of teachers are having Working Knowledge about Television. 92 per cent of teachers are having Working Knowledge about Charts. 86 per cent of teachers are having Working Knowledge about Graph board.
74 per cent of teachers are having Working Knowledge about Workbooks. 71 per cent of teachers are having Working Knowledge about Diagrams. 69, 67 and 60 per cent of teachers are having Working Knowledge about Models, Magazines and Measuring Instrument respectively. 59, 58, 53 and 52 per cent of teachers are having Working Knowledge about Newspaper cuttings, Journals, Album and Working Models respectively. Below 50 per cent of teachers are having Working Knowledge about Display board, Bulletin board, Flash cards, Matching cards and Geo board. Below 40 per cent of teachers are having Working Knowledge about Rolling board, Xerox Machine, Museum and Educational Video Films. 32 per cent of teachers are having Working Knowledge about Computer. Below 30 per cent of teachers are having Working Knowledge about Flannel board, Peg board, Magnetic board, Matching cards, Epidiascope, Over Head Projector, VCR and Ink Duplicator. Below 20 per cent of teachers are having Working Knowledge about Internet, Floppies, Filmstrip Projector, Xerox Machine, Film Projector, Educational Video Films, Transparencies, Video Camera and Micro Computer.

**Hypothesis-4**

The B.T. Assistants in Mathematics in Bharathidasan University Jurisdiction are not having positive attitude towards the application of Educational Technological Aids.

**Result: 4**

All the teachers are having positive Attitudes towards the Application of Educational Technological Aids at secondary school level.
Hypothesis-5

There is no significant relationship between the Availability of Educational Technology and the Institutional variables such as (a) Type of School (b) Locality (c) Nature of Institution and (d) Language of Instruction.

Hypothesis-5.a

There is no significant relationship between the Availability of Educational Technology and Institutional variable ‘Type of School’.

Statistical Techniques Used : Chi-square test

Variables Analysed : Availability of Educational Technology and the variables type of schools such as Boys, Girls and Co-education.

Interpretation (i) In all the Educational District of Bharathidasan University Jurisdiction. It is not significant even at 0.05 level. So null hypothesis is accepted. Thus it is concluded that there is no significant relationship between the type of schools and the availability of Educational Technology.

Hypothesis 5.b

There is no significant relationship between the Availability of Educational Technology and Institutional variable ‘Locality’.

Statistical Techniques Used : Chi-square test
Variables Analysed: Availability of Educational Technology and the locality of schools.

Interpretation: (i) In Thanjavur, it is significant at 0.01 level. But in Tiruchirapalli, Thiruvarur, Nagapattinam and Pudukkottai Educational Districts, it is significant at 0.05 level. So, null hypothesis is rejected. The urban schools are more equipped with Educational Technology than rural schools.

(ii) But in Pattukkottai, Karur and Perambalur Educational Districts, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the availability of Educational Technology and the Locality of Schools.

**Hypothesis-5.c**

There is no significant relationship between the Availability of Educational Technology and variable, ‘Nature of Institution’.

Statistical Techniques Used: Chi-square test

Variables Analysed: Availability of Educational Technology and Nature of the Institution (Govt. / Aided).

Interpretation: (i) In Thanjavur and Thiruvarur Educational District, it is significant at 0.01 level but in Nagapattinam Educational District, it is significant at 0.05 level.
So, null hypothesis is rejected. The aided schools are equipped with Educational Technology more than government schools.

(ii) In Tiruchirapalli, Pattukkottai, Pudukkottai, Karur and Perambalur Educational Districts, it is not significant even at 0.05 level. Null hypothesis is accepted. There is no significant relationship between the Government Schools and Aided Schools in the availability of educational technology.

Hypothesis-5.d

There is no significant relationship between the Availability of Educational Technology and variable, ‘Language of Instruction’.

Statistical Techniques Used : Chi-square test

Variables Analysed : Availability of Educational Technology and Language of Instruction (Tamil / English and Tamil).

Interpretation: (i) In Thanjavur Educational District, it is significant at 0.01 level. So, null hypothesis is rejected. The schools having both Language (Tamil and English) of Instruction are equipped with Educational Technology more than Tamil as a Language of Instruction.
(ii) In Tiruchirapalli, Pattukkottai, Thiruvarur, Nagappattinam, Pudukkottai, Karur and Perambalur Educational Districts, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the availability of Educational Technology in the school of Tamil as a Language of Instruction and Both Language (Tamil and English) of Instruction.

The listing of above hypothesis revealed that the availability of Educational Technology is not adequate in all the Educational Districts. The availability of Educational Technology in urban schools is better than the rural schools in the Educational Districts of Thanjavur, Thiruvarur, Nagappattinam, Pudukkottai and Tiruchirapalli. There is no difference between the urban and rural schools in the Educational Districts of Pattukkottai, Karur and Perambalur. Aided schools are better than Government schools in the Educational Districts of Thanjavur, Thiruvarur and Nagappattinam. There is no difference between the Government schools and Aided schools in the Educational Districts of Pattukkottai, Pudukkottai, Karur, Perambalur and Tiruchirapalli. The schools having both language (Tamil and English) of instruction are better than Tamil as a language of instruction in the Educational Districts of Thanjavur but not in the other Educational Districts.
Hypothesis-6.a

There is no significant relationship between the Utilization of Educational Technology and Institutional variable ‘Type of School’.

Statistical Technique used : Chi-square test.

Variables Analysed : Utilization of Educational Technology and the Type of School (Co-ed. / Girls / Boys)

Interpretation: In all the Educational Districts of Bharathidasan University Jurisdiction, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the utilization of Educational Technology and the Type of School.

Hypothesis-6.b

There is no significant relationship between the utilization of Educational Technology and Locality.

Statistical Technique used : Chi-square test.

Variables Analysed : Utilization of Educational Technology and the Locality (Urban / Rural).

Interpretation: (i) In all the Educational Districts of Bharathidasan University Jurisdiction, it is not significant even at 0.05 level. So, null hypothesis is accepted. The utilization of Educational Technology in urban schools is not better than that of rural schools.
Hypothesis-6.c

There is no significant relationship between the utilization of Educational Technology and Nature of Institution.

Statistical Technique used : Chi-square test.

Variables Analysed : Utilization of Educational Technology and the Nature of Institution (Govt. / Aided).

Interpretation: (i) In Pattukkottai, Thanjavur, Nagapattinam, Pudukkottai, Tiruchirapalli, Karur and Perambalur Educational Districts, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the utilization of Educational Technology in Government and Aided Schools.

(i) In Thiruvarur Educational District it is significant even at 0.05 level. So, null hypothesis is rejected. The utilization of Educational Technology in aided schools is better than that of government schools.

Hypothesis-6.d

There is no significant relationship between the utilization of Educational Technology and Language of Instruction in Schools.

Statistical Technique used : Chi-square test.

Variables Analysed : Utilization of Educational Technology and the Language of Instruction (Tamil / English and Tamil).
Interpretation: (i) In Thanjavur Educational District it is significant at 0.01 level. So, null hypothesis is rejected. The utilization of Educational Technology in the schools of both Language (Tamil and English) of Instructions is better than the schools having Tamil as Language of Instruction.

(ii) In Pattukkottai, Thiruvarur, Nagapattinam, Pudukkottai, Tiruchirapalli, Karur and Perambalur Educational Districts, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the utilization of Educational Technology and Language of Instruction in Schools.

The testing of above hypothesis reveals that the utilization of Educational Technology is not related to the type of schools in all the Educational Districts. The utilization of Educational Technology is not related Loecality in all the Educational Districts. The utilization of Educational Technology is not related Nature of Institution except Thiruvarur District and Language of Instruction in all the Educational District except Thanjavur District.

Hypothesis-7.a

There is no significant relationship between the Utilization of Educational Technology and Teachers’ Sex.
Statistical Technique used : Chi-square test.

Variables Analysed : Utilization of Educational Technology and Sex.

Interpretation: In all the Educational Districts of Bharathidasan University Jurisdiction, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the utilization of Educational Technology and the teacher's sex.

**Hypothesis-7.b**

There is no significant relationship between the Utilization of Educational Technology and teachers' Age.

Statistical Technique used : Chi-square test.

Variables Analysed : Utilization of Educational Technology and Age.

Interpretation: In all the Educational Districts of Bharathidasan University Jurisdiction it is not significant at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the utilization of Educational Technology and the teachers' age.

**Hypothesis-7.c**

There is no significant relationship between the Utilization of Educational Technology and teachers' Educational qualification.

Statistical Technique used : Chi-square test.
Variables Analysed : Utilization of Educational Technology and the teachers’ Educational Qualification.

Interpretation: (i) In all the Educational Districts of Bharathidasan University Jurisdiction, except Pudukkottai Educational District it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the Utilization of Educational Technology and teachers’ Educational Qualification.

(ii) In Pudukkottai Educational District, there is significant relationship between the utilization of Educational Technology and the Educational qualification of the Teachers at 0.01 level.

Hypothesis-7.d

There is no significant relationship between the utilization of Educational Technology and teachers’ Teaching Experience.

Statistical Technique used : Chi-square test.

Variables Analysed : Utilization of Educational Technology and Teaching Experience.

Interpretation : In all the Educational Districts of Bharathidasan University Jurisdiction, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the Utilization of Educational Technology and Teaching Experience.
The testing of above hypothesis reveals that utilization of Educational Technology is not significantly related to teacher variables such as Sex, Age and Teaching Experience. It is significantly related to the Educational qualification of the teachers.

Hypothesis-8.a

There is no significant relationship between the Working Knowledge in handling Educational Technological Aids and Sex of the teachers.

Statistical Technique used : Chi-square test.

Variables Analysed : Working Knowledge in handling Educational Technological Aids and Sex of the teachers.

Interpretation : In all the Educational Districts of Bharathidasan University Jurisdiction, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the Working Knowledge in handling the Educational Technological Aids and Sex of the teachers.

Hypothesis-8.b

There is no significant relationship between the Working Knowledge in handling Educational Technological Aids and Age of the teachers.

Statistical Technique used : Chi-square test.
Variables Analysed : Working Knowledge in handling the Educational Technological Aids and Age of the teachers.

Interpretation : In all the Educational Districts of Bharathidasan University Jurisdiction, it is not significant even at 0.05 level. So, null hypothesis is accepted. There is no significant relationship between the Working Knowledge in handling the Educational Technological Aids and Age of the teachers.

Hypothesis-8.c

There is no significant relationship between the Working Knowledge in handling Educational Technological Aids and Educational Qualification of the teachers.

Statistical Technique used : Chi-square test.

Variables Analysed : Working Knowledge in handling Educational Technological Aids and Educational Qualification of the teachers.

Interpretation: (i) In all the Educational Districts of Bharathidasan University Jurisdiction except Pattukkottai Educational District, it is significant. So, null hypothesis is rejected. There is significant relationship between the Working Knowledge in handling the Educational Technological Aids and
Educational Qualifications at 0.05 level of significance in Thiruvarur, Nagapattinam, Tiruchirapalli, Perambalur and Karur educational districts and at 0.01 level of significance in Pudukkottai and Thanjavur Educational Districts.

The teachers with post graduate degrees are having more working knowledge in handling educational technological aids than the teachers with under graduate degree in Mathematics.

(ii) In Pattukkottai Educational District, it is not significant at 0.05 level. So null hypothesis is accepted. There is no significant relationship between the working knowledge in handling the Educational Technological Aids and Educational qualification.

Hypothesis-8.d

There is no significant relationship between the Working Knowledge in handling Educational Technological Aids and Teaching Experience of the teachers.

Statistical Technique used : Chi-square test.

Variables Analysed : Working Knowledge in handling Educational Technological Aids and Teaching Experience of the teachers.

Interpretation : In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Working Knowledge in handling the Educational Technological Aids and Teaching Experience of the teachers.
The testing of the hypothesis reveals that in all the Educational District except Pattukottai, the Working Knowledge in Educational Technology is significantly related to the Educational Qualification but not related to Sex, Age and Teaching Experience of the teachers. In Pattukottai Educational District, Educational Technology is not significantly related to the Educational qualification.

Hypothesis-9

There is no significant relationship between the attitude of teachers towards the application of Educational Technological Aids and Teacher's variables such as (a) Sex (b) Age (c) Educational Qualification and (d) Teaching Experience.

V.11. Interpretation

Since all the teachers have responded 'Yes' for the question, whether the use of Educational Technology is useful. It has been concluded that all the teachers are having positive attitude towards Educational Technology irrespective of the variables such as (a) Sex (b) Age (c) Educational Qualification and (d) Teaching Experience.

V.12. Summary of the Findings

Result: 1 Average Percentage of Availability

Black board is available in 100 per cent of schools. Instrument box is available in 99 per cent of schools. Radio is available in 87 per cent of schools. Charts are available in 80 per cent of schools. Tape Recorder is available in 72 per cent of schools. Television and Diagrams are available
in 70 per cent of schools. Graph board is available in 69 per cent of schools. News Paper cuttings are available in 65 per cent of schools. Models and Working models are available in 61 per cent of schools. Typewriters and Magazines are available in 50 per cent of schools. Measuring Instrument, Display board and Albums are available in below 50 per cent of schools. Bulletin board, Journals and V.C.R. are available in below 40 per cent of schools. Rolling board, Flash cards, Matching cards, Geo board, Museum, Slide Projector, Over Head Projector and Ink Duplicator are available in below 30 per cent of schools. Flannel board, Rotating Discs, Glass board, Epidiascope, Filmstrip Projector and Xerox Machine are available in below 20 per cent of schools. Peg board, Magnetic board, Film Projector, Educational Video Films, Transparencies, Video Camera, Micro Computer, Internet and Satellite are available in below 10 per cent of schools.

Result: 2 Average percentage of Utilization

100 per cent of schools are utilizing Black board. 96 per cent of schools are utilizing Instrument box. 87 per cent of schools are utilizing Radio. 80 per cent of schools are utilizing Charts. 79 per cent of schools are utilizing Tape Recorder. 76 per cent of schools are utilizing Graph board. 70 per cent of schools are utilizing Diagrams, 66 per cent of schools are utilizing Television. 65 per cent of schools are utilizing computer. 63 and 62 per cent of schools are utilizing News Paper cuttings and Workbooks. 56 per cent of schools are utilizing Magazines, Models and Working models. 49, 48 and 41 per cent of schools are utilizing Typewriter and Measuring Instrument and Album respectively. 35 per
cent of schools are utilizing Display board. 32, 31 and 30 per cent of schools are utilizing Geo board, Bulletin board, Flash cards, Matching cards, Display board and VCR respectively. 29, 28 and 27 per cent of schools are utilizing Journals, O.H.P. and Ink Duplicator respectively. 25, 23 and 20 per cent of schools are utilizing Slide Projector, Museum, Rolling board and Xerox Machine respectively. Below 20 per cent of schools are utilizing Flannel board, Glass board, Rotating Discs, Epidiascope, Educational Video Films, Filmstrip Projector, Video Camera and Floppies. Below 10 per cent of schools are utilizing Peg board, Magnetic board, Transparencies, Micro Computer, Internet and Satellite.

Result: 3 Average percentage of Working Knowledge

100 per cent of B.T. Assistant Mathematics Teachers of Bharathidasan University Jurisdiction are having Working Knowledge about Black board and Instrument box. 99 per cent of teachers are having working knowledge about Radio. 93 per cent of teachers are having Working Knowledge about Television. 83 per cent of teachers are having working knowledge about Graph board. 78 per cent of teachers are having Working Knowledge about Workbooks. 76 per cent of teachers are having Working Knowledge about News Paper cuttings. 75 per cent of teachers are having working knowledge about Models and Charts. 71 per cent of teachers are having working knowledge about Diagrams. 67, 62 and 60 per cent of teachers are having Working Knowledge about Magazines, Working models and Album respectively. 56, 54, and 51 per cent of teachers are having Working Knowledge about Measuring Instrument, Journals and Geo board respectively. Below 50 per cent of
teachers are having Working Knowledge about Display board, Bulletin board, Flash cards and Museum. Below 40 per cent of teachers are having Working Knowledge about Flannel board, Matching cards, Epidiascope, Slide Projector, O.H.P., Typewriter and VCR. 32 per cent of teachers are having Working Knowledge about Computer. Below 30 per cent of teachers are having Working Knowledge about Peg board, Glass board, Rotating Discs, Rolling board, Ink Duplicator and Slide Projector. Below 20 per cent of teachers are having Working Knowledge about Magnetic board, Filmstrip Projector, Xerox Machine, Floppies, Film Projector, Educational Video Films and Transparencies. Below 10 per cent of teachers are having working knowledge about Video Camera, Micro Computer, Internet and Satellite.

Conclusion: 4

Result: 4

All the teachers are having positive attitude towards the application of Educational Technological Aids at Secondary School level.

Result: 5 In all the Educational District of Bharathidasan University Jurisdiction such as

5.a. Thanjavur, Pattukottai, Nagapattinam, Thiruvarur, Pudukkottai, Tiruchirapalli and Karur Educational Districts, there is no significant relationship between the Availability of Educational Technology and the type of schools.

5.b.i. In Thanjavur, Tiruchirapalli, Thiruvarur, Nagapattinam, and Pudukkottai Educational Districts there is significant relationship between the Availability of Educational Technology and the
locality of schools. The urban schools are more equipped with educational technology than rural schools.

5.b.ii. In Pattukkotai, Karur and Perambalur Educational Districts, there is no significant relationship between the Availability of Educational Technology and the Locality of schools i.e., urban and rural.

5.c.i. In Thanjavur, Thiruvarur, Nagapattinam Educational Districts there is significant relationship between the Availability of Educational Technology and the Nature of Institution. The aided schools are equipped with educational technology more than government schools.

5.c.ii. In Tiruchirapalli, Pattukkotai, Pudukkottai, Karur and Perambalur Educational Districts there is no significant relationship between the Availability of Educational Technology and the Nature of Institution i.e., government and aided schools.

5.d.i. In Thanjavur Educational District there is significant relationship between the Availability of Educational Technology and the Language of Instruction in schools. The school having both (Tamil and English) Languages of Instruction are equipped with Educational Technology more than Tamil as a Language of Instruction.

5.d.ii. In Tiruchirapalli, Pattukkotai, Thiruvarur, Nagapattinam, Pudukkottai, Karur and Perambalur Educational Districts there is no significant relationship between the Availability of Educational Technology and the Language of Instruction of the schools.
6. a. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Utilization of Educational Technology and type of schools i.e., Co-education, Boys' and Girls'.

6. b. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Utilization of Educational Technology and Locality of Schools.

6. c. i. In Pattukkottai, Thanjavur, Nagapattinam, Pudukkottai, Tiruchirapalli, Karur and Perambalur Educational District, there is no significant relationship between the Utilization of Educational Technology and Nature of Institutions.

6. c. ii. In Thiruvarur Educational District, there is significant relationship between the utilization of Educational Technology and Nature of Institutions. The Utilization of Educational Technology in Aided Schools are better than in the Government Schools.

6. d. i. In Thanjavur Educational District, there is significant relationship between the Utilization of Educational Technology and Language of Instruction of Schools. The Utilization of Educational Technology in the schools of both Language of (Tamil and English) Instruction is better than schools having Tamil as Language of Instruction.

6. d. ii. In Pattukkottai, Thiruvarur, Nagapattinam, Pudukkottai, Tiruchirapalli, Karur and Perambalur Educational Districts, there is no significant relationship between the Utilization of Educational Technology and the Language of Instruction in schools.
Result: 7

7.a. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Utilization of Educational Technology and Sex of the teachers.

7.b. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Utilization of Educational Technology and Age of the teachers.

7.c.i. In all the Educational Districts of Bharathidasan University Jurisdiction, except Pudukkottai Educational District, there is no significant relationship between the Utilization of Educational Technology and the Educational Qualification of the teachers.

7.c.ii. In Pudukkottai Educational District, there is significant relationship between the utilization of Educational Technology and Educational qualification of the teachers. The Post graduate teachers utilized more than the Under graduate teachers.

7.d. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Utilization of Educational Technology and Teaching Experience of the teachers.

Result: 8

8.a. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Working Knowledge in handling of the Educational Technological Aids and Sex of the Teachers.

8.b. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the
Working Knowledge in handling of the Educational Technological Aids and Age of the Teachers.

8.c.i. In all the Educational Districts of Bharathidasan University Jurisdiction except Pattukkottai Educational District, there is significant relationship between the Working Knowledge in handling of the Educational Technological Aids and the Educational Qualification of the teachers. The teachers with Post Graduate degree are having more working knowledge in handling educational technological aids than the teachers with undergraduate degrees in Mathematics.

8.c.ii. In Pattukkottai Educational District, there is no significant relationship between the working knowledge in handling of the Educational Technological Aids and the Educational Qualification of the teachers.

8.d. In all the Educational Districts of Bharathidasan University Jurisdiction, there is no significant relationship between the Working Knowledge in handling of the Educational Technological Aids and teaching experience of the teachers.

Conclusion: 9

Since all the teachers of all the educational districts have responded 'Yes' for the question whether the Utilization of educational technology is useful, it has been concluded that all the teachers are having positive attitude towards the educational technology irrespective of the variables such as sex, age, educational qualification and teaching experience.
V.13. Incidental Findings

1. Album, News Paper cuttings, Flash cards are available only in below 50 per cent of schools. So teachers can help the students to cultivate their interest towards this subject by making them to collect these teaching aids.

2. Though some schools do not have Working Models, The teachers can arrange an educational tour to show Scientific Museum in Chennai and Mysore.

3. Though some schools do not have computer, the teachers concerned take the students to the computer centre and physical make the necessary arrangement of the teachers to show Video Films on Mathematics.

4. The data also indicate that the overall average of availability utilization and the Working Knowledge in handling computer is very low (Given in Table No.171). This would have worst effect on teaching computer to the secondary school students as they have a lesson regarding computer in their curriculum.
Table 174

Percentage of Availability and the Utilization of Educational Technology and Working Knowledge about Computer in the Educational Districts of Bharathidasan University Jurisdiction

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Educational District</th>
<th>% of Availability</th>
<th>% of Utilization</th>
<th>% of Working Knowledge in handling Computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Thanjavur</td>
<td>66</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>2.</td>
<td>Pattukkottai</td>
<td>36</td>
<td>39</td>
<td>21</td>
</tr>
<tr>
<td>3.</td>
<td>Thiruvarur</td>
<td>48</td>
<td>57</td>
<td>24</td>
</tr>
<tr>
<td>4.</td>
<td>Nagapattinam</td>
<td>38</td>
<td>42</td>
<td>26</td>
</tr>
<tr>
<td>5.</td>
<td>Pudukkottai</td>
<td>33</td>
<td>31</td>
<td>29</td>
</tr>
<tr>
<td>6.</td>
<td>Karur</td>
<td>43</td>
<td>43</td>
<td>35</td>
</tr>
<tr>
<td>7.</td>
<td>Perambalur</td>
<td>34</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>8.</td>
<td>Tiruchirapalli</td>
<td>67</td>
<td>65</td>
<td>44</td>
</tr>
</tbody>
</table>

 Aggregate of Availability = 46  
 Aggregate of Utilization = 46  
 Aggregate of Working Knowledge = 32
Fig. 29a, b and c. Percentage of Availability and the Utilization of Educational Technology and Working Knowledge about Computer in the Educational Districts of Bharathidasan University Jurisdiction

a.

![Graph a]

b.

![Graph b]

c.

![Graph c]

V.14. Educational Implication of the Study

Based on the findings of the following recommendations have been suggested by the investigator.

1. The availability of Educational Technology should be adequate in the schools to a satisfactory level. Tiruchirapalli Educational District, being the Centre of learning in Tamil Nadu that is well connected with other Educational District in Bharathidasan University Jurisdiction does not have much provision of Educational Technology. It is the duty of the educational authorities to provide these schools with such advanced Educational Technology.

2. It is recommended to the government that there is an urgent need to take steps to establish the schools with advanced Educational Technology and the educational authorities may check whether the usage of these equipments are implemented by the teachers.

3. Though many aided and government schools have such facilities the teachers do not utilize educational technology as they are unaware of handling and utilizing such equipments. This can be rectified by conducting frequent trainings, inservice courses and seminars, explaining and demonstrating the operation of these equipments.

4. It has been found out that all the teachers are having positive attitude towards the use of educational technology in teaching Mathematics. So, it has to be found out where the teachers are lacking and the proper steps may be undertaken to the positive attitude change in to the action. The Government of Tamil Nadu
recently, directed all the primary teachers to enter into the classes with some teaching aids. Some amount has also been granted. This may be extended to secondary level also particularly for the teaching of Mathematics.

5. It has been incidentally found that some interested teachers took the students to the nearby Computer Centre and make the necessary arrangements to show them Video Films on Mathematics. Therefore it has been recommended that the schools may be inter-linked with computer network. The privilege may be given to the schools not having VCR to arrange the Video Films for the students.

6. Some special incentive schemes to encourage the teachers for better application of Educational Technology could be considered for implementation of the teachers by Educational Authorities.

7. It is suggested that the rural schools should be equipped with modern aids like Computers and Internet to make secondary school student familiar with it.

8. All schools may be provided with at least one computer, because the secondary level students have a lesson about computer in their curriculum.

V.15. Recommendations Incidental Findings

The investigator found that the availability of computer is inadequate in the Educational Districts of Bharathidasan University Jurisdiction. The average percentage of the Availability of Educational Technology is 45 per cent. The investigator also found that, 32 per cent of
B.T. Assistants in Mathematics only are having Working Knowledge in handling Computers.

Though there is a lesson about computer for secondary level students, the teachers are unable to impart such Knowledge to the students' as they don’t have any Working Knowledge about Computer. These minor errors can be rectified by giving special innovative training regarding computer to the teachers and conducting seminars for the students at regular intervals.

V.16. Suggestions for Further Studies

It is suggested that further studies may be undertaken in the following titles.

1. The utilization of Educational Technology can be replicated at Primary and Secondary level.

2. It is suggested that the same study may be replicated to different Educational District of Tamil Nadu.

3. The similar study may be replicated with a large number of sample in Tamil Nadu.

4. The studies may be undertaken to find out the utilization of Educational Technology on teaching of the subjects other than Mathematics.

5. The experimental studies may be undertaken to find out the impact of Educational Technology on teaching of different subjects.
V.17. Conclusion

In this world of science and technology, advancement in Educational Technology should be brought into all the classrooms. The outcome of this study has thrown more light on the uses of Educational Technology with reference to the optimum development of individual learners. It will be beneficial to all those system of education, the teachers and the educational institutions.

We are living in the era of rapidly growing advanced technological days, where the students are very much enthusiastic in learning more through T.V., VCR and Internet. When such students are dealt with it should be in the hearts of the teachers that they should equip themselves with the latest knowledge, so that they will be capable of disseminating the knowledge effectively by using Educational Technological Aids.