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PLAN AND PROCEDURE

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III.6 PROCEDURE

III.1 INTRODUCTION

Having reviewed the related literature it was decided to develop multimedia Instructional package for Std. IX for Botany, following the steps provided by Wittich and Schuller (1973).

III.2 METHOD

The Survey and Experimental methods were used in this study.

III.2.1.Survey Method

III.2.1.(a) Survey, Its meaning and Definition

The term 'Survey' has been derived from 'Vecir' or Veoir' and 'Sur' or 'Sor' which means 'over' and 'see' respectively Survey, therefore, literally means 'seeing over' a particular thing from a high place. In natural sciences, the term 'Survey' can be used only when direct contact is made between the investigator and the subject. It includes the collection of data through any method say interview, questionnaire, library or books etc.

The method of research which concerns itself with the present phenomena in terms of conditions, practices, beliefs, processes, relationships or trends is termed as 'Survey'.

III.2.1.(b) Characteristics of Survey

1) It is concerned not with the characteristic of individuals but with characteristics of the whole population or a sample thereof.

2) It collects data from relatively large number of subjects.

3) It provides information useful to the solution of local problem.

4) Its scope is very vast.

5) Surveys may be qualitative or quantitative.

6) Descriptions may be either verbal or expressed in mathematical terms.

III.2.1.(c) Types of Information to be collected.

1) Of what exists.
2) Of what we want.
3) Of how to get there.

III.2.1.(d) Kinds of Survey

1) Survey studies.
2) Case studies.

3) Developmental studies.

4) Follow-up studies.

5) Documentary studies.

6) Trend Analysis.

7) Correlational studies.

III.2.1.(e) Types of Documentary Studies

1) Text book Analysis.

2) Curriculum Analysis.

3) Job Analysis.

4) Vocabulary Analysis.

5) Error Studies.

6) School records and report analysis.

The Investigator carried out a documentary study, in which the Text book analysis of Text book of 'Biology Std. IX'. was carried out.

III.2.2. Experimental Method

III.2.2.(a) Experiment and Its meaning

Experiment is the basis of scientific research. Through this method, it is possible for the investigator to test the hypothesis about the conditions. In natural sciences, everything is studied on the basis of experiments. The investigator studies the phenomenon under the controlled conditions.

III.2.2.(b) Characteristics of Experiment and Experimental Method

Experimental method has two characteristics;

1) Control over the subject of study.

2) Manipulation of the independent variables to study their effect upon the dependent variables.

Investigator used experimental method for the present study.

Experimental procedure for evaluating the effectiveness of a Multimedia Instructional Package used is discussed in the following paragraphs.

III.3 EXPERIMENTATION

III.3.1. Research Problem

"DEVELOPMENT OF A MULTIMEDIA INSTRUCTIONAL PACKAGE IN BOTANY FOR STD. IX"

Every experiment involves variables, dependent and independent and their relationships.

III.3.2 Variables in the Experiment

The variables involved in the experiment were :

III.3.2.(a) Dependent variable

Achievement of students in terms of scores, ability of learning, behavioural changes of the students, the three dependent variables were combined into a single variable i.e. scores achieved in post-test.

III.3.2.(b) Independent variable

Sex, socio-economic status, age, intelligence, control area, teacher, her efficiency, school atmosphere, class-room situation, method of instruction, equipments used for instruction, instructional media and materials, evaluation procedures, etc. are some of the independent variables.

Though there were so many variables, the investigator decided to consider only two independent variables in the experiment namely sex and method of instruction. The effect of remaining independent variables on dependent variables were controlled by the experiment.

III.3.3 Control of the Experiment

Randomization technique was used in controlling the extraneous variables. Two parallel groups of standard IX students were obtained and equated. Random sampling technique was used. The sampling technique used in picking out the sample is explained in detail later.

This process of randomization helped the investigator in controlling socio-economic status, age, class-room situation, intelligence etc.

It was decided to keep content, time of instruction, evaluation procedure common for both the groups.

III.3.4. The Experimental Design

There are various types of experimental designs out of which the investigator had decided to use pre test - post test equivalent groups design for the present study.

III.3.5 The Expertment

The experiment was conducted within one month, the procedure of which is explained in the following paragraphs.

A content achievement test in botany for Std. IX, was administered on the students from Std. IX in the two schools (Viz. Jantara High School and Laxmibai Patil Girls High School, Jaysingpur).

The schools were randomly selected from 7 marathi medium schools in Jaysingpur city. The answer-scripts were assessed. The scores of the content achievement test were collected, and

60 students were randomly selected as a sample for the study.

A control group was exposed to treatment A1 and experimental group was exposed to treatment A2. Same content area were constructed to both groups.

The control group was instructed with traditional method of instruction. Five well-planned lessons on 'classification of plants and tissues of plants' of Std. IX were conducted, entering and terminal behaviour of the students were evaluated.

The experimental group was instructed with multimedia Instructional package, five well-planned lessons were conducted. Entering and terminal behaviours of the students were evaluated.

The investigator herself conducted all five lessons to both the groups. Three science teachers were asked to observe the lessons with the help of lesson-observation rating scale. (Appendix E)

The treatment was completed in one month. Then post test (Appendix K) was administered on both the groups. The responses of the students were collected interms of scores achieved by the students.

The data collected in terms of scores in pre and post tests were analysed and interpreted. Statistical measures such

as 'mean', 'S.D.' correlation, and 't' test were used (Chapter V)

Conclusions were drawn about development of Multimedia Instructional Package.

Summary, conclusions and recommendations were stated in Chapter VI.

III.4. TOOLS USED IN THE PRESENT STUDY

The researcher has used the following tools in data collection for the present study :

1) Interview.

2) Multimedia Evaluation Package Questionnaire.

3) Content Achievement Test (Pre and Post-Test).

4) Lesson Observation Rating Scale eash of the tools is discussed below :

III.4.1. Interview

Interviews of 20 science teachers and three technological experts were arranged for deciding the design of the Multimedia Instructional Package.

III.4.1.(a) Meaning and definition of interview

The term interview or the technique of interview has been defined by different scholars in various ways.

Definition of Interview

Neither reliability nor depth can be achieved however unless it is kept clearly in the mind that interview is fundamentally a process of interaction.

III.4.1.(b) Characteristics of Interview

1) It is closed contact or interaction including dialogue between two or more persons.

2) There is definite object of interview such as knowing the views and ideas of others.

3) There is face-to-face contact and relationship between individuals.

4) Through this tool, data are collected for the study.

III.4.1.(c) Major Objectives of the Interview

1) Collecting information about unknown facts through face to face contact.

2) Formulation of hypothesis.

3) Collecting information about qualitative facts.

4) Collecting additional information or views of different persons about different problems in different situation.

III.4.1.(d) Merits of Interview Method

1) Possible to study events that are not open to observation.

2) Possible to study factors like attitude, feelings, emotions, reactions etc.

3) Possible to study the phenomena in the historical background.

4) The information gathered is quite reliable.

5) Even past events can be studied through this method.

III.4.1.(e) Demerits/Limitations of Interview

1) The data collected are of a doubtful character.

2) Too much dependence on memory.

3) Specialized knowledge is not always possible.

4) Danger of unnecessary details.

5) Lot of subjectivity and individual feeling.

III.4.1.(f) Techniques of interviews

1) Preparation.
2) Sympathetic listening.
3) Balanced and timely questions.
4) Critical points should be avoided.
5) Closure of interview.

The interview schedule covered all questions related to the development of Multimedia Instructional Package.

(Appendix C)

III.4.2. Multimedia Package Evaluation Questionnaire

III.4.2.(a) Questionnaire

Questionnaire was one of the tools used in the present study. It was concerned with evaluation of multimedia Instructional package.

III.4.2.(b) What is Questionnaire ?

"Set of questions is used for collecting data".

In general questionnaire refers to a device for securing answers to question by using a form which the respondent fills in himself.

III.4.2.(c) Types of Questionnaire

For the convenience of the study it has been divided into various forms or types on the basis of subject matter or nature of the questions or the structure. The questionnaire may be divided into following two heads:

1) Structured questionnaire.
2) Non-structured questionnaire.

On the basis of nature or types, structure of the questionnaire may be divided into the following two forms:

1) Closed questionnaire.
2) Open questionnaire.

3) Pictorial questionnaire.

4) Mixed questionnaire.

III.4.2.(d) Merit/Advantages of the Questionnaire

1) Less cost and expenditure.

2) Possibility of covering a large area.

3) Greater reliability and validity of information secured.

4) Free from external influence.

5) A good method for collection of respective information.

6) Rapidity and quickness.

7) Collecting of relevant information according to the object.

III.4.2.(e) Multimedia Package Evaluation Questionnaire

Multimedia Instructional Package Evaluation Questionnaire was framed with the help of three technology experts and 20 science teachers (Appendix D).

Questionnaire had two sections.

Section A - Preliminary section of personal information of respondent.

Section B - Related to Evaluation of Multimedia Instructional package. It consists of twenty questions.

III.4.3. Content Achievement Test (Pre-test)

Content achievement test on unit 'classification of plants' of Std. IX Botany (Appendix G) was administered on Std. IX students in both the schools under study.

The objectives of the pre-test were to examine the previous knowledge of the students. Content achievement test was prepared by investigator herself and it was based on the content of the unit 'classification of plants' for Std. IX. Pre-test was administered on both the groups. Answer scripts were assessed, and data was collected in terms of scores achieved by the students (Appendix G).

III.4.4. Content Achievement Test (Post-Test)

Investigator herself prepared content achievement test based on the content on the units, 'classification of plants and tissues in plants' of Std. IX Botany.

After teaching the 5 well-planned lessons to both groups, it was post-tested Answer scripts were assessed and Data was collected in terms of scores achieved by both the groups. (Appendix H)

III.4.5. Lesson Observation Rating Scale

This was the tool used for lesson observing by the observers in this experiment. It was a marathi version of Broad

General Teaching Competence (BGTC) scale prepared and standardized by centre of Advanced Study in Education M.S. University Baroda.

The rating scale covered 18 items which were related to introduction, presentation, participation of the students, use of instructional materials, evaluation of the students.

It was seven point rating scale with minimum 0 and maximum 136 marks. (Appendix E).

III.5.1. Sampling Method

Before research work, the investigator has, to decide whether the entire population is to be made the subject for data collection or a group is to be selected as representative of entire population. The former method when the entire population is taken into account, is called 'Census Method'. On the other hand when a small group is taken into account as representative of the whole it is called 'Sampling Method'.

III.5.1.(a) Definition of Sampling Method

Sampling method has been defined by various scholars in various ways,

(1) P.V.Young - According to P.V. Young, "A statistical method is a miniature picture or cross-section of the entire group or

aggregate form which the sample is taken.

(Scientific social Survey and Research pp87)

III.5.1.(b) Advantages of sampling method

1) Economy of time.
2) Economy of resources.
3) Detailed study.
4) Accuracy of Results.
5) Administrative convenience.
6) Difficulties of the census method are not faced.

III.5.1.(c) Characteristic of a good sample

A good sample is that which fulfills the objectives of the research. A sample, in order to be good, should have the following characteristics:

1) Representative character.
2) Adequate number of samples.
3) Selection free from bias and prejudice.
4) Conformity to subject matter and means.
5) Use of common knowledge.
6) Use of past and other practical experiences.

Due to limitations of time available, it was not possible to study entire population therefore, subject, teacher, expert, student samples were selected in the following way:

III.5.1.(d) Subject Sample

The subject sample was content of the two topics in Botany of Std. IX. The topics were 'Classification of the plants' and 'Tissues in plants'. These two topics were purposely selected for developing Multimedia Instructional Package, because concepts in it were difficult to be understood by the students unless it was explained with specific media and material to fulfil the specific objective of the concept. The units 'Photosynthesis and Ascent of Sap' was omitted because it consists of experiments for which the laboratory is essential and multimedia package was not found suitable for it.

III.5.1.(e) Science Teachers Sample

Twenty science teachers from seven marathi medium High schools from Jaysingpur were randomly selected and interviewed, for developing Multimedia Instructional Package. Twenty science teachers were randomly selected from Marathi medium schools in Sangli and Miraj city and they were given questionnaire for evaluation of Multimedia Instructional Package.

III.5.1.(f) Educational Technology Experts Sample

Purposeful selection of three Educational Technology Experts from Sangli and Jaysingpur city formed the experts sample for developing and Evaluating the Multimedia Instructional Package.

III.5.1.(g) Students Sample

Out of seven marathi medium High schools in Jaysingpur, random selection of one school was made. A sample of 30 boys and 30 girls of Std. IX from the school were randomly divided into two groups. The Experimental group for which Multimedia Instructional Package was used, and control group which were taught the units in the traditional method.

III.6. Procedure

After selecting units from Std. IX Botany, the content was analysed for the concepts on which Multimedia Instructional Package could be developed. 20 science teachers and 3 Educational Technology experts were interviewed for guide-lines and experts opinion in development of the Multimedia Instructional Package.

Developing the Multimedia Instructional Package involved the following steps -

1) Stage I : Define

   a) Indentify the problem.

   b) Analysis setting.

   c) Organise management.

2) Stage II : Develop.

   a) Identify objectives.

   b) specify methods.

   c) Construct prototype.

3) Stage III : Evaluate

a) Test Prototype.

b) Analysis of results.

3) Implement.

(Wittich and Schuller,
Instructional Technology, New York
1973)

The steps and procedure involved have been elaborated in Chapter IV.

In order to evaluate Multimedia Instructional Package, the researcher decided to conduct an experiment on 60 students of Std. IX.

A content Achievement Test (Appendix A) was prepared to test the previous knowledge of students in unit 'Classification of plants' with prior permission and the dates of the experiment were fixed with the school authorities as 24th, 25th, 26th, 27th and 28th August, 1993 for conducting 5 lessons.

The researcher herself conducted the well-planned 5 lessons with Multimedia Instructional Package to experimental group and with traditional method to control group.

The lessons were observed by three science teachers with the help of Lesson Observation Rating Scale (Appendix E)

The Content Achievement Test (Post-test) was administered on both the groups at the end of the experiment. Pre-test and Post-test results were tabulated. The observations by experts were recorded based on these two information, the Multimedia Instructional Package was evaluated in Chapter IV.