CHAPTER 7

SUMMARY AND IMPLICATIONS

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7.1 INTRODUCTION

The investigator has selected the area of her work is related with primary education. In her work, she tried to correlate the use of technology in education through the use of computer. She developed the item-bank for class seven science and computer programme for its application. In this chapter the summary of the development of item-bank and its implication is given.

7.2 SUMMARY

The main objective of the present study was to develop the computerised item-bank for the class seven Science. For the process, the steps given below were followed one by one.

Development of item-bank

For the development of item-bank the investigator has put the steps on the ladder.

A) Construction of the items
   1. Analysis of the content of seventh grade Science.
   2. Adoption of learning areas and competencies in the textbooks as educational objectives.
   3. Classification of chapters into the units.
   4. Derivation of concepts imbibed in each competency
   5. Item writing

B) Validation of item-bank
   1. Preparation of test-papers according to units
   2. Try - out of Item-bank
   3. Scoring Procedure
   4. Item-analysis with the help of collected information/ responses.
C) Computerization of items

This step involves the typing of items. The computer programme which developed, is in FoxPro.

1. Typing of items in MS-word.
2. Preparing the structure of data file in FoxPro.
3. Appending the items from MS-Word to the data file in FoxPro.
4. Preparation of the scoring key.
5. Verification of the data file

D) Development of Computer Programme

The detail of the each step is discussed briefly here.

A) Construction of the items:

1. Analysis of the content of seventh grade Science:

   The whole syllabus was analysed into specific units and subunits so that the content involved in the final form of the item-bank may be fairly representative of the course being taught in Class VII.

2. Adoption of learning areas and competencies in the textbooks as educational objectives:

   The objectives are written in the form of competencies as the syllabus is followed the framework of Minimum Levels of Learning (MLL). The investigator has adopted the competencies in the text book as educational objectives.

3. Classification of chapters in the units:

   This learning area wise analysis resulted in the listing of twenty different topics classified in the four major units was consisted five chapters each. It was a plan of stratification that is followed in drawing up a representative sample of items from the possible domain of tasks(items) covering the entire
course content. It was used to show the types of behaviour to be elicited with respect to each area.

4. Derivation of concepts imbibed in each competency:
   All the competencies were analysed to derive the concepts imbibed in them.
   The list of competency wise concepts is given in the chapter five.

5. Item writing:
   By keeping in view the concepts, maximum possible items were constructed.
   The items were of totally objective type such as multiple choice, fill the gaps, true-false, answer in one word or integer and match the following. A list of suggestions was prepared by means of constructing good items. Also, all the items were checked by language teacher and subject experts for two major aspects – language of the item and the content. Every care was taken to achieve the optimum quality of item at the construction stage.

B) Validation of Item-bank:
   1. Preparation of test papers according units:
      After a collection of items has been prepared and examined by subject experts, it was revised on the basis of their judgments. Total 8 papers were prepared from the constructed item-bank. Unit wise 2 set of test papers were prepared. 1st set of each unit consisted three types of questions, those were – multiple choice type, true-false type and match the following type. 2nd set of each unit consisted two types of questions, those were – Fill the gaps and answer in one word or in an integer type. Likewise all the 8 papers were prepared.

   2. Try-out of the Item-bank:
      In preliminary collection of items, the investigator has 482 multiple choice items, 167 true-false items, 22 match the following items, 223 fill the gaps items and 243 answer in one word items, covering about the whole syllabus of Class VII science. It was ordinarily being tried out experimentally on a representative sample of examinees. Approximate 2000 students were
selected to administer the four different test papers. Four districts – Ahmedabad, Bhavnagar, Gandhinagar and Rajkot were randomly selected and in each district one test paper was administered on 500 students from different five schools of each district.

3. Scoring Procedure:
The investigator scored the test papers by using an easier approach. A right answer was scored as 1, and a wrong answer was scored as 0. The score of candidate on the whole test was the number of items he/she did right. It is to be noted that no correction was applied for clever guessing while scoring the items.

4. Item analysis:
Item-analysis was done by using the computer programme ‘NRT VB’ prepared by Nvneet Rathod, Reader, Dept. of Education, Bhavnagar University. Item analysis was done mainly for two aspects – Facility Value and Discrimination Index.
As a convention, a facility value between 0.20 and 0.80 was considered desirable for the selection of an item for the final item-bank. Most of the selected items have facility value between these ranges.
Most of the discrimination indices for the selected items are above 0.30.

5. Item selection:
An item satisfying both the conditions given above was selected for inclusion in the final form of item-bank. Out of 1139 total items, 1096 items were selected for the final item-bank.

C) Computerisation of items:
This step first involves the typing of selected items in the application MS-word of Microsoft Office. Also typing of answer key was appended from MS-word to the data file in the FoxPro as the computer programme developed for the application of item-bank is in FoxPro. Verification of the data was also done to eradicate any type of error.
D) Development of Computer Programme for the application of item-bank:

Investigator has developed the computer programme IB2002 in Gujarati language for class seven science for the application of item-bank. The programme is useful for test construction, acquisition and scoring. Also, it is useful to students for practice, revision and drilling of the content. The main application of the computer programme is to evaluate the students by giving the test.

The programme developed is in FoxPro language of computer. For the development of the programme, coding was done for each field, i.e. for learning area, competency code and competency number. Two .dbf files were created; one was compet.dbf for competency information and another was Question.dbf for the selection of learning area, competency code, question type and question particular. Input, output and process of the programme is also discussed in chapter six.

7.3 IMPLICATIONS

Every new research has its sources in the previous research literature in the concerned field, and in turn has some important implications for further research. Research of all kinds is directed towards the goal of discovering new knowledge about nature. So that the new knowledge might be utilized for making the human living more comfortable. A research study is meaningful if its outcome can be put to a profitable use to solve a problem of human interest. In the context of education nearly all research investigations are directed towards generating new knowledge about improving teaching learning practices. All educational efforts must be aimed at improving the academic performance of students irrespective of their abilities, social background and motivational levels. A research study must help in achieving this objective by providing innovative theories and practices. In the present study, the investigator has made an attempt to develop the item-bank and develop a computer
programme for its application. The programme is indeed a very useful one for the practitioners of the educational field.

7.3.1 Educational Implications

The investigator does not claim to have an exhaustive study of the problem in question, yet it is emphasised that various aspects of the problem have been kept in the consideration as extensively and deeply as possible. The outcomes of the study have some important implications for educational practices in general and curriculum planning, teaching methods and evaluation techniques in particular. The outcomes also have some implications for further research in this field as it relates to the Research and Development cycle. The detailed discussion of these implications follows.

7.3.1.1 Application of the computerised item-bank

1. In the preparation of the test paper according to its’ blueprint.
2. For enlisting the questions for the students as to drill the content and revision purpose.
3. To give the test to students through computer (computer assisted testing - CAT). The test can be of adaptive type.
4. In scoring of the answers given by the students by computer.
5. More than one form of the test paper can be developed.

7.3.1.2 Additional advantages of Computer Assisted Testing

1. Scoring of the answer given by the students is done at a time by the computer, so the result can be known immediately.
2. For the correct or incorrect answer, immediate feedback can be provided.
3. By enlisting the incorrect answers given by the students, items can be improved or reformed.
4. By using the item-writing technology, with the help of computer, unlimited number of items can be constructed.
5. Random selection of the question is possible.
6. Through the Internet connections, the limitation of the place and time is ended. From anywhere, anytime, the item-bank can be used.
7. By using artificial intelligence, scoring of the essay type questions can be made possible by computer.

So, by using the item-writing technology, item-bank can be developed. Item-bank can be made valid by the technical and logical review. This item-bank can be computerised on feeding the items in the computer. With this, Computer Assisted Testing - CAT can be made possible.

With the help of computerised item-bank, improvement in examination procedure and improvement of quality of primary education can be made possible.

7.3.2 Recommendations

Item-bank developed under the present study is related to the scientific conceptual understanding of the students of class seven.
1. Similar studies are necessary in other school subjects of each class of primary education.
2. It is also desirable to carry out the research study to check the conceptual understanding of students in each subject.
3. Comparative studies for measuring the conceptual understanding by teaching with the help of computer and with the traditional method can be done.
4. Item-bank development is research and development cycle, so in the constructed item-bank under the present study, improvements can be made possible to improve the quality of item-bank.
5. Item-bank consisted the performance based items can be developed.