CHAPTER 1

THE PROBLEM AND DEFINITION OF THE TERMS

1.1 Introduction

1.2 Statement of the Problem

1.3 Importance of the Study

1.4 Major Objectives of the Study

1.5 Definition of the terms used

1.6 Scope and Limitations of the Study

1.7 Organization of the Remainder of the Report
1.1 INTRODUCTION

Concept is not a direct knowledge obtained through the senses but is a product of interactive process of senses feeling with the past experiences. Concepts are developed through the analysis of the generalized element of different experiences.

Cognitive content can be analyzed into Truth, Concept and Rules. Subjective conceptual clarity is most important. Conceptual learning is the fundamental stone of higher education. If concept is wrong or not properly understood does not lead to the proper way.

Subject teacher evaluates the scientific conceptual clarity of the students according to the curriculum during the teaching process. Examination also measures this, but its' in the limitation. It is necessary and also of interest to know the students' conceptual understanding /clarity. Conceptual understanding is a base of science education. Changes are very fast and in that Science & Technology has put the world at the bank of reversal.

Reliable measure is the voice of this era. For this measurement needs scientific tool. In the beginning of the 20th century, construction of scientific approached test has been started. Importance and requirement of valid tools is undeniable.

Improvement in the examination system is one of the solutions in the improvement of education process. Question paper is an important organ of the examination body. Question paper improvement accelerates the improvement of examination system. Item bank is necessary to construct the question paper scientifically. Item bank is important in education as well as in its evaluation.
Carefully prepared and checked item bank helps in the fast preparation of highly qualitative question paper and also leads students for learning.

In India, sixties of the 20th centuries - a fundamental change came in the concept of educational measurement. Concept of evaluation was also started to represent with the measurement. Examination is not the last point of the educational process but is an element to give the direction towards the improvement in the process of overall development through education. Then after objectivity has taken a permanent place in the educational evaluation process. After this, in this field so many researches have been done mainly related to scientific tool construction for educational evaluation and improvement in the examination method.

Bloom (1956), in the taxonomy of educational objectives in the cognitive domain, proposed a hierarchy of cognitive skills development starting with knowing and understanding facts and concepts, and moving to the ability to apply knowledge and evaluate outcomes. The application of this hierarchy into schools led to concern about the concentration of our education system on 'knowing' rather than higher order skills such as 'applying'. This in turn influenced the introduction of educational innovations such as the Nuffield Science Curriculum. One of the concerns, on both sides of the Atlantic, is a reversal of this trend and a refocusing on practice rather than application skills with the introduction of classroom computers.

According to Kemmis (1977) and his Colleagues - Educational software can be classified into four educational paradigms.

- The **instructional paradigm**, which includes programmed learning and drill and practice.
- The **revelatory paradigm**, in which the learner makes discoveries using simulations.
• The **conjectural paradigm**, using the computer to build and evaluate models, and

• The **emancipatory paradigm**, in which the computer is used as tool to manipulate numbers or text or for information handling. So freeing the user to concentrate on the learning experience.

These four paradigms can be clearly related to four conditions of learning, which are together with their computer-based applications:

• **Intellectual learning**, which includes learning, practicing and testing rules or concepts. (e.g. drill - and - practice programmes)

• **Cognitive learning**, which includes problem-solving using, previously learnt rules. (e.g. adventure games and some simulations)

• **Verbal (and, in the case of computers, visual) information learning**, which includes learning from hearing or reading (or seeing) about a subject (e.g. demonstration programmes including some simulations)

• **Motor skill learning**, which includes developing and testing perceptual/motor skills (e.g. arcade games).

Certain trends in research in the area of ET are clear when compared to the work reported in earlier surveys. There are more studies in this area. Partly, this could be due to the general increase in research in education, but it could also be reflective of the importance being given to the area, especially to communication technology.

Level-wise most of the studies are addressed to the secondary level. The faculty of the departments of education of the universities is drawn from those holding degrees in education, which have been prerequisites for teaching at the
secondary level. Aspirants for a Ph.D. degree look forward to working in Teacher Education colleges and prefer working in areas relevant to secondary education. Though primary education is a crucial area, those working in teacher training schools do not have the basic training in research. As the numbers and the problems in education are most numerous at this stage, greater attention should be paid to the application of ET at primary level. This emphasis already has expression in a greater use of radio and television in primary schools but the impact of Computer Aided Instruction should be studied, also its management and other use needs to be studied continuously.³

It is interesting to note that through Computer Assisted Instruction is a virgin field, it could lure only three researchers. Looking at the trends the entire world over, it is expected that Indian researchers would go into Computer Education more enthusiastically. One can only hope that this fertile field will not go unnoticed and many more studies would be taken up in this area.

By keeping in view, all the above aspects and criteria, the investigator decided to work for the primary education. As seventh grade's curriculum as been implemented from the scholastic year 99-2000, also the investigator her self is a student of Science subject, she selected the class seven science for the work.

Selection criteria for the item-bank was to make teacher and students ready to adopt the modern technology in easier way for their day to day work and to achieve their ultimate goal of better teaching – learning.

1.2 STATEMENT OF THE PROBLEM

The statement of the problem, either in question form or as a declarative statement, the attempt should focus on a stated goal to give direction to the research
process. It must be limited enough in scope to make a definite conclusion possible. It is desirable that the problem selected be formulated simply and clearly. It is important to write the research problem, in clear, non-technical language, avoiding jargon and try to stimulate the reader's interest.

The below given statement is the selected problem.

"Construction of concept based Computerised Item-bank for Seventh grade Science and Development of Computer Programme for the Application of Item-bank"

1.3 IMPORTANCE OF THE STUDY

The impact of Science and Technology is visible everywhere. Science has influenced every aspect of man's existence - vocational, social, economic, political and cultural. Science is intimately related to the means of production and means of communication, including transport. In turn, it influences the public both as a consumer and as a citizen. In such situations it is essential to understand science. Today, an understanding of science is useful to live successfully. But, for gainful employment in the fields of science and technology, it is essential to acquire specialized knowledge in science. In other words, it can be said that to understand one's environment and to become a partner in the growth of science and technology, it is essential to acquire specialised knowledge of science. Hopefully, it will make a person scientifically literate citizen who can live efficiently and can take proper decision.

Science is different from other forms of knowledge because it has to meet reality tests, that is, ideas have to correspond to our perceived reality of the world. This characteristic has given a chance to science to minimize subjective opinions and to establish objectivity and rationality. Science establishes its objectivity through
observation, experimentation, and formulation of hypotheses and their testing and then by drawing relevant inferences. It follows from this description that scientific beliefs are essentially independent of cultural and geographical factors. A scientific statement can be checked by experiment by anybody, anywhere in the world. You can make such checks. It is open to further experimentation, and in the light of new evidence it may be modified and changed. Hence, scientific concepts are generated by the workers going through the processes of science. Scientific concepts are developed while conducting laboratory work and field study.4

This can be schematically explained as follows:

Process → Concept → Process → Concept → Process

These processes build a body of scientific knowledge and it continues to search the unknown.

Thus, science is a self-renewing, self-correcting and self-generating process.5

Facts become meaningful, and the awareness of facts ultimately becomes productive, when they are perceived within the structure of basic concepts. We may modify George Gaylord Simpson's definition of science slightly; Science is the exploration of the material universe for the purpose of seeking orderly explanations that must be testable. The products of science - which are its orderly explanations and the technology that results from the particular application of them - are the results of certain processes. The processes comprise, first, the observation and examination of data, including experimentation; second, the formulation of explanations by means of inventing hypotheses and stating theories; and third, the testing of all this, the explanations, leads inevitably to other explorations and still other explanations. There are ends in science, but there is no end to science itself.6

It was envisaged in the Sixth Plan itself that modern technology should be used extensively to extend education to all sectors of society as well as to improve the
quality of education in a shorter frame of time than would have been necessary with approaches known and adopted in the past.  

The commitment of the country to use the technology is thus expressed in the National Policy on Education, 1986:

- Modern communication technologies have the potential to bypass several stages and sequences in the process of development encountered in earlier decades. Both the constraints of time and distance at once become manageable. In order to avoid structural dualism, modern educational technology must reach out the most distant areas and the most deprived sections of beneficiaries simultaneously with the areas of comparative affluence and ready availability - Academicians take a broader view of 'Educational Technology' (ET) than technology in the use of education.

Education still needs to take full advantage of modern technologies. Modern formal education became a reality for the common man with the adoption of the most important of all technologies.

Since education involves a very large number of human beings and directs the lives of all, it is necessary that new approaches be adopted with full understanding and care. Research, thus, needs to be an integral part of all programmes of ET.

Technology, by itself, cannot solve the problems of extension and needed improvement in education. Human variables are extremely important, both in the use of technology and as affected by its use. A continued watch is needed. Evaluation is an important component of educational technology in its broader meaning. It is expected that future research surveys would have a great deal more to report in this area.
The proposed study will give this benefit to the teachers and student. The study is the combination of education and technology. The programme, which will be developed, will be helpful to teacher in evaluating the students in their curriculum; to students in drilling and revision of the syllabus. Also, it will give a rich bank of items.

So, in view of the today's need, education must be associated with the use of technology. This technology must help teachers as well students to make easy their daily practices.

1.4 MAJOR OBJECTIVES OF THE STUDY

Most important aspect of planning a research-based educational product is the statement of the specific objectives to be achieved by the product. Objectives provide the best basis for developing an instructional program, since the program can be field-tested and revised until it meets its objectives.

Objectives pertain to the study under report are given below.

For seventh grade science -

- To construct Concept based computerized item-bank.
- To develop a computer programme for the application of computerised item-bank like-
  - To prepare a qualitative question-paper.
  - To take a computer based science test such that students can get their score.
  - To make a quiz.
  - To practice and drill for the subject.
1.5 DEFINITION OF THE TERMS USED

It is important to define all unusual terms that could be misinterpreted. This definition helps to establish the frame of reference with which the researcher approaches the problem.

The following terms require precise definition.

Science: It has been defined in different ways by different authors. One of the definitions, among all-

"It is an endless process of observation, exploration and acquisition through empirical and conceptual means".

Science is defined as:" systematic knowledge of natural or physical phenomena; truth ascertained by observation, experiment, and introduction. Ordered arrangement of facts known under classes or heads; theoretical knowledge as distinguished from practical. Knowledge of principles and rules of invention, construction, mechanism, etc. as distinguished from art."8

Concept: A concept is an idea generalized from particular and relevant experiences and is called the product of Science.

In brief definition, a concept is a mental structure; it is a grouping of the common elements or attributes shared by certain objects and events. Once a concept is attained, economy in future learning is also attained. For by engaging in the processes of concept formation, the learner is active in selecting the essential attributes of the complete event. And the learner is enabled to predict an entire
sequence of events, or an entire set of characteristics or properties, from a small
number of cues or signs. Thus, fuzz of mold on a piece of fruit or on moist bread is a
cue signalizing an entire event.\textsuperscript{9}

Defined in other words, a concept is a network of inferences stemming from
observation of objects and events, and resulting in the selection of common elements,
or like attributes, among the objects and events under observation. Identifying and
organizing the common, or like, attributes results in a significant category or
grouping. That significant category is a concept. A concept is practical and useful
because the perception of a small number of attributes, cues, or signals.

**Operational Definition of Science Concept:**

In the present study, Science concept I the competencies which are excepted to be
achieved by the students of Class VII under the syllabus of Class VII Science.

**Item-bank:** A bank developed by the formation of so many items.

**Computerised Item-Bank:** A bank developed by the formation of so many items,
which has been used by developing a computer programme.

**1.6 SCOPE AND LIMITATIONS OF THE STUDY**

Limitations are those conditions beyond the control of researcher, which may
place restrictions on the conclusions of the study and their application to other
situations. In other words, we can say that they set the boundaries of our study.

Limitations for this study are listed below.

1. This study is limited to Gujarati medium only.
1.7 ORGANISATION OF THE REMAINDER OF THE REPORT

After having identified a specific project that appears to be satisfactory, the student should outline a research plan as much detail as possible.

The tentative research plan should contain the sections such as: introduction and problem description, statement of the objectives or hypotheses, listing of possible tests or measures to be used in the study, description of the proposed sample, research design, a chronological description of the procedures to be used in carrying out the project, and plans for carrying out analysis of data to be collected.

An important advantage of a research plan is that it compels one to state all one's ideas in written form so that they can be evaluated and improved upon by the researcher and others. Even a simple research project contains many elements, and it is easy to overlook some of them unless they are all written down in a systematic manner.

To make research plan simple, to avoid many errors and miscalculations, it is imperative that before writing a research project the investigator must have a design for writing the chapters of the study. Mostly all research articles are organised in essentially the same manner. Theses and dissertations follow this same organizational pattern. Some variations are found in the requirements of different universities.

The investigator had the following pattern for the remainder of the chapters of her research.

Chapter two - 'Conceptual Framework' deals with the introduction of Technology- especially with computer and Internet. Also, it would give the importance and use of item-bank, also computerised item-bank.
The third chapter reviews the important literature related to the study. Previous research studies are abstracted, and significant writings of authorities in the area under study are reviewed. This part of the research report has provided a background for the development of the study, which is under report and brought the investigator up to date. Since good research is based upon everything that is known about a problem, this part of the report gives evidence of the investigator's knowledge of the field. In this chapter the investigator has talked in detail about the relevant literature and the previous theses related to her study and how has became beneficial to her.

The fourth chapter explains the design of the study in detail. The size of the samples and how they are selected, the sources and methods of gathering data, the reliability of instrument constructed, and the statistical procedures used in the analysis are carefully described.

The chapter five deals with the item-bank preparation. It describes the selection of the concepts from the text and classification of them into the terms, processes and definitions. Types of items, which have been constructed for each concept belongs to the specific competencies of each learning area and finally the shaping of the item-bank for all the learning areas. also It includes the presentation and analysis of the data. This is the heart of the research report. Through textual discussion and tabular devices, the data are critically analyzed and the reported. Tables are used to clarify significant relationships. Proper tables are constructed and titled relevantly so that they became self-explanatory. Textual discussion is used to point out generalizations and significant interpretations, but no to restate the information that they have presented.
The chapter six relates with the development of the computer programme for computerised item-bank. The package used for the programme development is introduced in detail with its important and application for the purpose. Also, the manual - how to use the programme is explained in detail with the relevant steps. Importance of the developed programmed in the education is also discussed.

The chapter seven consists of a summary. After a brief statement of the problem and description of the procedures used in the investigation, the findings and conclusions are presented. Findings are statements of factual information based upon the data analysis. Conclusions are answers to the questions raised.
REFERENCES


2. Ibid., p. 779-80.


5. Ibid., p. 313


