

CHAPTER-2
REVIEW OF LITERATURE

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2.1 Introduction

This chapter deals with the review of literature that is directly or indirectly related to the study proposed by the investigator. Resourceful information on the problem to be investigated is one of the most important steps in the planning of any research. Every piece of ongoing research needs to be connected with the work already done to attain overall relevance and purpose. The review of literature acts as a link between the studies already conducted in the field/area and the research proposed. There are mostly three stages in most of the reviews which are- finding relevant information, appraisal of relevant and contextual information and synthesizing and summarizing findings into a set of collective conclusions.

2.2 Indian Studies

For the purpose of conducting research, the investigator reviewed Indian studies which all related to the present problem. The related studies are given below.

JOSEPH, T.T.(1979) conducted a research work on "**A STUDY OF PREDICTORS OF ACHIEVEMENT IN CHEMISTRY AT THE PRE DEGREE LEVEL**". The objectives of the study were

- i) To find out the association between each of the independent variables and different achievement levels in chemistry in terms of the ability of each of the independent variables to discriminate between the different achievement levels compared in pairs.
- ii) To find out the degree of association between each of the independent variables and achievement in chemistry, achievement in terms of correlations and arrange the independent variables in terms of their efficiency to predict achievement in chemistry.
- iii) To develop an equation to predict achievement in chemistry using efficient predictors identified.

The study was conducted on a representative sample of 560 pre degree students of Kerala. Ten variables measured using tests of accepted validity and reliability were number series formulation, spatial ability, verbal comprehension and interpretation and critical thinking under cognitive variables, attitude towards science, science interest, personal adjustment and social adjustment under effective variables and achievement in chemistry as dependent variables. The measures were analyzed using t-test, product moment coefficient of correlation, multiple prediction equations and factor analysis.

The major findings of the study were;

1. All the nine independent variables discriminated between the high achievers and the average achievers, average achievers and low achievers, high and low achievers.
2. All the nine independent variables correlated significantly with achievement in chemistry at the pre degree level.

UCHAT, D.A. (1982), conducted a research work on "**STUDY OF THE REACTIONS REGARDING THE VARIOUS SYLLABI UNITS OF BIOLOGY, CHEMISTRY, MATHEMATICS AND PHYSICS SUBJECTS OF STANDARD XII**".

The main objectives of the study were

- i) to determine the difficulty level for various units of the syllabi of biology, chemistry, mathematics and physics subjects of standard XII, as viewed by high achieving students and low achieving students according to the results of SSLC and the results of the respective subjects of standard XII and
- ii) to determine the difficulty level for various units of four science subjects of standard XII as viewed by all students and teachers of the respective subjects.

The sample consisted of 485 students of standard XII, from all the higher secondary schools of Rajkot. The sample also comprised 48 teachers of Biology, 45 teachers of Chemistry, 49 teachers of physics and 45 teachers of mathematics - selected from higher secondary schools and science colleges of Gujarat state. With the help of text-books, syllabi and qualified experienced teachers of each subject, four lists of instructional units were carefully prepared. In all 173 units in Biology, 142 units in Chemistry, 100 units in mathematics and 143 units in physics were listed in the final schedules. A five point scale was used for getting the opinions regarding the difficulty level of various units 51 of each subject. The difficulty level of each unit was determined on the basis of these opinions.

The major findings of the study were,

- 1) In the subject of biology, out of 27 chapters, six were difficult, while 50 units (out of 173 units) were found most difficult in various chapters of biology.
- 2) In the subject of chemistry out of 15 chapters, seven were found difficult, while out of 142 units of the whole curriculum of chemistry, 50 units were found most difficult.
- 3) In the subject of mathematics, out of 11 chapters 5 were found difficult and out of 100 units, 40 units were difficult.
- 4) There were 18 chapters and 143 units in the curriculum of physics. Among these, seven chapters and 53 units were found difficult.
- 5) Among these four science subjects. Physics was considered as the most difficult subject and biology was considered as the least difficult one.

PRAKASH CHANDRA (1975) conducted a study on "**THE PROBLEMS OF INTERMEDIATE STUDENTS WITH CHEMISTRY IN THE VARANASI EDUCATIONAL REGION OF U.P. AND THEIR RELATIVE EFFECT ON ACHIEVEMENT**".

The objectives of the investigation were

- i) To study the extent of the various problems of Intermediate students,
- ii) To make comparative study of the problems of rural and urban students and
- iii) To study the effect of these problems on the academic achievement of the students.

The sample consisted of 1107 high school students appearing at the high school examination of 1972 conducted by the Board of High school and 45 intermediate education, UP. The sample was drawn from twenty seven randomly selected institutions.

The following were the findings of the study

- a) In the economic area the acute problems were non availability of the dress, furniture, light for study, text books, sufficient food and self working.
- b) In the home area the acute problems were forced participation in household activities, unsatisfactory dealing and behavior of the parents and lack of guidance from the guardians.
- c) In the school area the problems were lack of reading learning facilities, heavy home assignments, good rapport between the teachers and the students.
- d) In the social area - due to friends, relatives, radios and adaptability to modern ways were found.

GHOSH, G.P. (1985), conducted a study on "A STUDY OF THE ACHIEVEMENT OF THE STUDENTS IN CHEMISTRY AND FINDINGS RELATIONSHIP WITH SOME OF THE DETERMINANTS"

The main purpose of the study were:

- i) to appraise the achievement of the students in physical science,
- ii) to appraise the extent of academic motivation, intelligence and socio-economic status of the students,
- iii) to find out sex-wise and strata-wise differences if determine relationship among the scores of the Achievement test in physical science, the Intelligence Test, the Academic Motivation Test and the Socio economic status scale and
- iv) to develop a regression equation of the achievement in science on intelligence, academic motivation and socioeconomic status.

Some of the major conclusions were

- (1) Urban students did not show better performance in the Achievement Test in Chemistry (ATC) than rural students.
- (2) Boys did not show superiority in ATC over girls,
- (3) There was a positive correlation between the scores in ATC and Academic Test, ATC and Group Intelligence Test, Urban and Rural students scores in ATC and "Education of the Parents" as well as "Occupation of the parents".
- (4) Scores in ATC could be predicted from the scores in Academic Motivation Test, Group Intelligence Test and SES (Socio Economic 55 Status) of the parents through multiple regression equation,
- (5) The ATC was reliable and valid. Norms were also satisfactory.

RAJRANI (1986) conducted a study on "A FACTORIAL AND VALIDATIONAL STUDY OF THE ABILITIES INVOLVED IN LEARNING CHEMISTRY AT THE SECONDARY STAGE"

The objectives of the study were

- i) to find out the Guilford's intellectual abilities involved in learning chemistry at the grade XI stage and
- ii) to find out the validity of Guilford's intellectual abilities in predicting success of students in a chemistry course. In the study stratified sampling technique was followed. The basis of stratification was the achievement of students in the public examination. The achievement of students in the public examination was the achievement of students in the public examination held by the secondary board of school education. The students were selected from five strata ranging from very high to very low achieving students. The actual number of students who completed all the tests from five strata was 250. Guilford's "Structure of Intellect" model and achievement test of chemistry were used as tools. The raw scores obtained on the chemistry achievement test were used as criterion scores. Chemistry achievement was used as a development variable.

The findings of the study were ;

1. Out of 29 structures of intellect (SI) Abilities only seven structures of Intellect (SI) abilities predicated achievement of students in the class 58 XI chemistry course. These SI abilities were CMT, NMU, DHR, CMS, DSU, NST and DMC.
2. Out of seven statistically significant SI abilities, six were positively related with chemistry achievement at the class XI stage.
3. On the basis of a students' scores on NMU, CMT, DHR, CMS, DSO, NST and DHC test, his performance on the chemistry test would be predicted.
4. The first factor has maximum contribution towards common variance.
5. The SI abilities supporting the "chemistry achievement factor" had two types of content i.e. symbolic and semantic. This was supported by regression analysis also therefore the content in the chemistry course reflected by the chemistry achievement test was symbolic and conceptual in nature.
6. Six other factors were identified but these six factors were not associated with chemistry achievement.

CHERIYAN, MOLLEY, (1988) conducted a study on "FACILITATIONS AND HINDRANCES TO THE MODERNIZATION OF CHEMISTRY TEACHING IN THE SCHOOLS OF KERALA"

Problem : The study addresses the conceptual and attitudinal aspects of modernization of chemistry teaching in the schools of Kerala.

Objectives : i) To find out the perceptions of modernization of the participants in education in Kerala,

ii) to measure the quantum of curricular upgradation and quality of conceptual processing in chemistry text books and

iii) to identify the major facilities and hindrances in the modernization of chemistry teaching.

Major Findings : 1) There was a gap of a decade between the introduction of modern concepts in chemistry and the corresponding modern pedagogical approaches.

2) The overall attitude to the modernization of science was favorable.

3) The correlation between age and attitude was positive for teachers and negative in the case of experts.

4) Workshops and inservice education programmes organized by the department of education received the topmost rating within the context of modernization of chemistry teaching.

5) Several facilitating and hindering factors were identified which related mainly to the administrative aspects.

THANGESWARI. M. (2000) conducted a study on "AN INVESTIGATION INTO THE PROBLEMS OF XI STANDARD STUDENTS IN LEARNING CHEMISTRY IN THE TUTICORIN EDUCATIONAL DISTRICT"

The objectives of the study were

1. To identify the areas in theory as well as in the practical part of XI standard chemistry curriculum which the pupils find difficult to comprehend.

2. To find whether there is any significant difference in the performance of the pupils differing in sexes, medium, kinds of institutions, parental status and parents educational qualification because of the difficulties in learning chemistry.

3. To find out whether there is any significant relationship between problems and achievement in chemistry in terms of sex, medium, locality, type of institutions, parents educational qualification and occupation.

The sample consisted of 300 students of XI, from all the Hr. Sec. Schools of Tuticorin educational district. In this study 125 boys and 175 girls are studied. According to the medium, Hindu, Non-Hindu, rural-urban, Among groups - within groups, with respect to caste, types of institution, fathers, mothers educational level, fathers mothers occupation etc are studied.

2.3 Foreign Studies

The investigator reviewed foreign studies. The related studies are given below.

1. **ZICHITTELLA, GAIL EBERHARDT (2002) conducted a study on "DETERMINATION OF VALIDITY AND RELIABILITY OF PERFORMANCE ASSESSMENTS TASKS DEVELOPED FOR SELECTED TOPICS IN HIGH SCHOOL CHEMISTRY".**
2. **RODDY, KNIGHT PHARES, (2003) conducted a study on "HIGH SCHOOL CHEMISTRY STUDENTS LEARNING OF THE ELEMENTS, STRUCTURE,**

AND PERIODICITY OF THE PERIODIC TABLE: CONTRIBUTIONS OF INQUIRY-BASED ACTIVITIES AND EXEMPLARY GRAPHICS".

3. GREENBERG, ANDREW (2004), conducted a study on "AUTHENTICITY IN THE CHEMISTRY TEACHING LABORATORY : TEACHING AND ASSESSING STUDENT UNDERSTANDING OF THE SCIENTIFIC RESEARCH PROCESS"
4. MARIA SHEEHAN (2010), conducted a study on "IDENTIFICATION OF DIFFICULT TOPICS IN THE TEACHING AND LEARNING OF CHEMISTRY IN IRISH SCHOOLS AND THE DEVELOPMENT OF AN INTERVENTION PROGRAMME TO TARGET SOME OF THESE DIFFICULTIES"
5. MICHELLE DENYSE, HILDA HERRIDGE (2016), conducted a study on "STUDENT IDENTIFICATION OF PROBLEM TOPICS IN GENERAL CHEMISTRY"