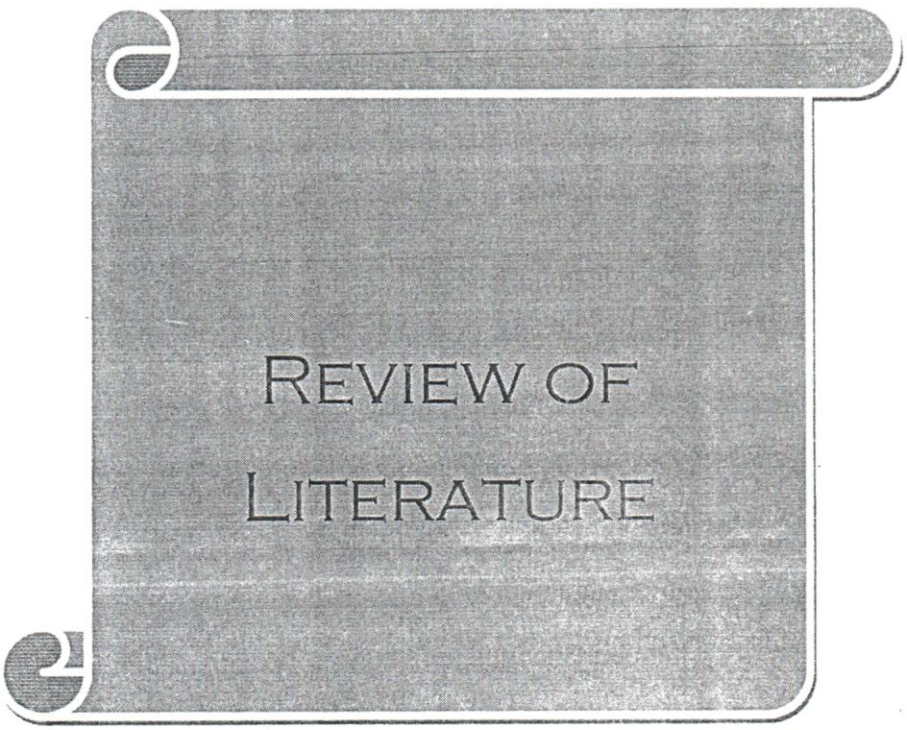
CHPATER-2



CHAPTER - 2

REVIEW OF RELATED LITERATURE

2.1 Introduction

Research takes advantage of the knowledge which has accumulated in the past as a constant human endeavor. It can never be taken in isolation Of the work that has already been do we on the problem which are directly or indirectly related to the study proposed by a researcher. A careful review of the research journal, books, dissertations, thesis, websites and other sources of information on the problem to be investigated is one of the important steps in the planning of any research.

2.2 Purpose of the review:

The review of the related literature, besides barrowing the research to acquaint himself with the current knowledge in the field or area in which is going to conduct his research serve be the following specific purposes.

- The review of related literature enables the research to define the Limit of his fixed.
- By reviewing the related literature the researcher can avoid unfruitful and useless problem areas.

- Through the review related literature the researchers can avoid unintentional duplication of well established finding.
- The review of related literature gives the researchers an understanding of the research methodology which refers to the way The study to be conducted.
- The final and important specific reasons for reviewing the related literature is to know about the recommendation of previous researcher listed in their studies for further research.

2.3 Development of School Mathematics

Education in the United States early on was not designed for all nor was it free. However, by the end of the nineteenth century most cities and states had established publicly supported elementary schools and the majority of children falling within this age range attended school. Nevertheless, few cities and states had publicly supported high schools and graduating from a high school was rare (Senk and Thompson, 2003, p. 5). In the nineteenth century, the mathematics taught in elementary schools consisted of arithmetic with whole numbers, fractions, decimals, and percents, broadened by work with measures of length, area, and volume (Senk and Thompson, 2003). Secondary schools were rare during the first half of the nineteenth century and those in existence were primarily used as college preparatory academics for males from privileged families. As the nineteenth century drew to a close dissatisfaction with the progression

of elementary and secondary mathematics was evident in the academic world.

During the 1900-1950 time period mathematics instruction in elementary and secondary schools was fragmented. The mental discipline (drill) theory of the nineteenth century was still evident. Also a more child-centered approach to teaching mathematics evolved. "Advocates of this more child centered view recommended that the teaching of mathematics should involve engaging students in activities from which the teacher, through discussion with students, could help students reflect on fundamental ideas and develop powerful habits of mind" (Senk and Thompson, 2003). Arithmetic textbooks supportive to this theory emphasized less systematic drill and increased the focus on solving practical problems and doing project work.

The 1987 report, The Underachieving Curriculum, released in the Second International Mathematics Study (SIMS) U.S. students did not score significantly above the international average on any test and in fact on many test U.S. students scored substantially below the international average. And "the National Commission of Excellence in Education cited declining SAT scores and an increase in remedial courses by colleges, businesses, and the military as evidence of a 'rising tide of mediocrity'" (Senk and Thompson, 2003 p. 9&10). The data cited from these reports led people to search for explanations for the poor levels of performance of mathematics students in

American schools.

2.4 Constructivism

Constructivism was first associated with art during the time after the RussianRevolution around 1917. Constructivism was successful during this time because everyone believed the Revolution would lead to a better future. However, this belief was abandoned when the Communist Party gained control in Russia. Constructivism was then suppressed until after World War II (Hubbard, 2002, p. 37).

Constructivism in education, however, is a theory that is based on results of Piaget's child development research. Piaget's developmental stages (Cooney, Cross, and Trunk, 1993; Glover and Bruning, 1990; Reys et al., 1998) have been cited and have served as a model for the development of new mathematics models that describe how students learn. Educational psychology, which has served as the link between the disciplines of education and psychology (Walberg and Haertel, 1997) has two major learning paradigms in the twentieth century—behaviorism and constructivism.

Major contributors to the behavioral psychology school of thought include Thorndike, Skinner, and Gagne (Reys et al.' 1998; Post, 1992). Behaviorism is grounded by stimulus-response theories that also include conditioned learning (Reys, et al., 1998). Behaviorism's presence in mathematics education provided a base for the exercise of drill and

practice. The purpose of drill and practice was to reinforce the mathematical skill that was being taught. Advocates of this school of thought viewed the brain as a muscle that needed to be exercised with repeated practice in order for student learning to occur. The problem with this type of learning was that students viewed each skill as separate, unconnected activities. Behavioral objectives required observable measurable learning outcomes that were often divided into small obtainable parts (Goldin, 1990).

Constructivism is an educational philosophy that believes learners ultimately construct their own knowledge that then stays within them, so that each person's knowledge is as unique as they are (Barnes & Stanley, 2000, p.327). In constructivism the emphasis is placed on the student rather than the teacher. Constructivist theorists contend that teachers should create situations or present engaging math problems for students that will foster their creating of models in response to those situations. The student is encouraged to invent his own solutions and given the opportunity to build on prior knowledge. Constructivists suggest that students learn mathematics best when it is real for them. Educators can make mathematics real by providing an environment where exploration and discovery is encouraged, reasoning is expected and communication is required.

Constructivists like Vygotsky and von Glasersfeld emphasized that conceptual processing occurs within the individual. Though there are

different interpretations of constructivism in mathematics education, all agree that the learner is actively constructing knowledge through ownership and involvement (Owen & Lamb, 1996). Supporting research suggests that learning would be more efficient if students were able to form connections that organize the out-of school mathematics experiences with the in school mathematics (Hiebert and Carpenter, 1992); in other words, make real world connections. Also, Reys et al. (1998) suggest three basic beliefs for constructivism: "(1) knowledge is actively created or invented (constructed) by students, (2) students create (construct) new mathematical knowledge by reflecting on their actions, and (3) students need to dialogue with the teacher and each other to promote intellectual growth." (p.19).

Riordan and Noyce (2001) conducted a study investigating the impact of standards based mathematics programs on student achievement in Massachusetts. There were twenty-one schools participating in this study. The schools were divided into two groups. One group consisted of a school that had implemented CMP for four years. The other group consisted of the remaining schools that had used CMP for either two or three years. The two groups were then matched with a comparison group using mean scores on previous state test, percentage of students receiving free or reduced-priced lunch, and racial and ethnic makeup. CMP students in both groups significantly outperformed students attending the comparison schools on the 1999 statewide standardized test (MCAS)(CMP Research and Evaluation Summary, 2003).

2.5 Review of previous research:-

The various resources identified by the researchers. The litereature related to this research are as follows.:-

1. **Das,R.C.(1968:"Impact of Remedial Teaching Programmes on the Common Errors Committed by Students of Standard IV in Mathematics".**

   From this literature, the conclusion generated by this there is positive impact of Remedial teaching on students.

2.Rastog.S. (1983):"Diagnosis of Weakness in Arithmetic as Related to the basic Arithmetic Skills and their Remedial Measures."

The objective of this study is to finding the errors and problems In mathematical teaching, mathematical arithmetic, finding Problems in mathmetics.

4. **Bhardwaj,R.P. (1987). " Standardization of a Comprehensive Diagnostic Test and Preparation of Remedial Material in Mathematics for Middle Standard Student of Haryana".**

   According to this study, the teaching material is effective.

On the mathematical problems , the teaching material is attractive and effective on learning process of the students.

5. **Raman, J.1989 "Impact of Remedial Teaching Programmes on The Common error Committed by Student of Standard XIth in Calculus".**

   The effect of the Remedial teaching on the students of the Class XIth in calculus. The remedial teaching improves the students aptitude towards the mathematics.

6. **Nalayini,S.(1991). "Effectiveness of Using Number Games to Touch Arithmetic at Primary level"". M.Phil., Edu.**

   'Number sense' is a term that is often used but is quite hard to define. In general, it refers to a student's ability to work with numbers flexibly and fluidly. Number sense involves giving meaning to numbers – that is, knowing about how they relate to each other and their relative magnitudes. It is also about the effect of mathematical operations on numbers, such as whether multiplication of a given number by another would make the number bigger or smaller. Having a sense of number is vital for the understanding of numerical aspects of the world. Learning and improving your sense of number is a lifelong activity that starts

with children. In school it requires exploring and playing with numbers, and being encouraged to think about patterns and relationships between numbers. In school mathematics this element of playing and having fun with numbers often gets missed out. This unit aims to address this by giving ideas for identifying and using number games as activities that offer rich learning opportunities to help your students develop their sense of numbers.

7. Bhatia, Kusum (1992), "Identification and Remedy of Difficulties in Learning Fractions with Programmed Instructional Material".

Instructional design research promotes interactive and adaptive scaffolds as features of educational technology. Mathematics education research can guide elaborated fractions curricula to develop basic fraction concepts while challenging the natural number bias. Thus, we developed theory-grounded interactive material for learning fractions providing scaffolds in an eBook. Evaluating both, curriculum and scaffolds, we split 745 high-achieving and 260 low-achieving 6th graders into three groups: Scaffolded Curriculum group (using the eBook on iPads), Curriculum group (using a paper copy of our developed material), and Traditional group (using conventional textbooks). Generalized linear mixed models revealed diverse positive effects on the achievement of students in the experimental conditions: Results showed that high-achieving students did benefit from the curriculum, regardless of whether it was presented with or without scaffolds, while for low-achieving students using scaffolds was decisive. This suggests

that interactive and adaptive scaffolds can support students in learning mathematical concepts, especially for low-achieving students.

8. **Subramaniam, K.B. and Ram Singh, A.K. (1996). "A study of Mistakes Committed by Student in the Application of Different Mathematical Skill and Developing Preventive And Remedial Teaching Strategies Using Metacognitive Approach for Quantitative Improvement in Teaching Mathematics" Independent Study.**

This article draws out the implications for school and classroom practices of an emerging consensus about the science of learning and development, outlined in a recent synthesis of the research. Situating the review in a developmental systems framework, we synthesize evidence from the learning sciences and several branches of educational research regarding well-vetted strategies that support the kinds of relationships and learning opportunities needed to promote children's well-being, healthy development, and transferable learning. In addition, we review research regarding practices that can help educators respond to individual variability, address adversity, and support resilience, such that schools can enable all children to find positive pathways to adulthood.

Summary

This chapter presents much of the research literature related to the development of school mathematics, standards based curriculum, constructivism, and the Connected Mathematics Project. The review of related literature suggest students using curriculum perform as well or better academically on state mandated standardized achievement test than non-CMP students. The literature further suggested that African American students are culturally programmed to behave cooperatively and to value relationships with others. Teaching as the developers intend cultivates the manner in which African American students learn best. In addition, achievement data indicates that females and students from low socioeconomic backgrounds using outperformed those same categories of students using traditional curricula.