

**PARENT'S MATHEMATICS LITERACY AND MATHEMATICS
ACHIEVEMENT OF THEIR CHILDREN**

**A
THESIS**

**BY
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Letter of Approval

Thesis

By

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"Parent's mathematics literacy and their Children achievement in mathematic"
has been approved in partial fulfillment of the requirements for Degree of Master of
Education.

Committee for the Viva-Voce

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LETTER OF CERTIFICATE

This is to certify that Mr. Dilli Ram Dhungana, a student of academic year 2068-2069 B.S. with thesis number 986, Exam Roll No. 281551/069, Campus Roll No.1333 and T.U. Regd. No. 9-2-55-659-2007 has completed his thesis under my supervision during the period prescribed by the rules and regulations of T.U. Nepal. The thesis entitled "**Parent's mathematics literacy and their Children achievement in mathematic**" has been prepared based on the results of his investigation. I recommendation and forward that his thesis submitted for the evaluation as the partial requirement to award the degree of Master of education.

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.....

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Abstract

The study entitled with “parent’s mathematics literacy and their children achievement in mathematics” is intended to find out the relation between parent’s mathematics literacy and their children achievement of grade VIII students. To fulfill the objectives of this study, the researcher had taken primary data for parent’s mathematics literacy, student’s achievement and parents supporting score. The score was taken from the questionnaire. For achievement test a set of multiple choice questions was prepared. In the same way parent’s mathematics literacy score was taken by both multiple choice question and subjective question and also parents supporting questionnaire by yes or no form. For the design of survey research six different schools were select randomly from two different V.D.C.s The total sample students were 60 and their 60 parents for such the 10 student’s were select randomly from each sample school and their parents. The parent’s mathematics literacy score and mathematics achievement test score of student were divided into six different groups according to the division way of literacy score of parent’s. This score was compared by using the Karl Pearson correlation and parent's supporting variable score was analyzed by percentage and mean score.

The coefficient of correlation showed that there was relation between mathematics achievement score of students and their parent’s mathematics literacy score. Also the parent’s literacy and their support to their child is more significant relation than others. Hence it is found that the mathematics score of students is affected by parent’s mathematics literacy and their supports.

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Chapter I

INTRODUCTION

Back ground of the study

In general, literacy skill is the ability of reading, writing, and calculating capacity of an individual. Literacy can be defined as “using printed and written information two function in society, to achieve one’s goals and to develop one’s knowledge and potential”. (Kirsch, Jungeblut, Jenkins and Kolstead, 1993, p.2). Literacy is the difficult task as there is multiple meaning of literacy. In English, the original meaning of literacy was ‘well educated’ or ‘learned’. However, the meaning of world literacy is closed to the translation of other language. In French word literacy refers to the ability to read and understands a simple text (UNESCO, 2006). By dictionary, literacy has been taken as the ability to read and write the text.

Before NNEPC in 1956, literacy practice in Nepal was very limited. Some adult literacy programmers on reading, writing and arithmetic were initiated in 1940s. Adult literacy programmed was conducted to trained Nepali youth to prepare for the British Gorkha army in India. (Koirala and Acharya 2006). After 1956 various literacy centers conducted literacy programs on literacy focusing with 3Rs (reading, writing and arithmetic) were continued during national education system plan (NESP) of 1970s, Basic and primary education projects (BPEP I and II) of 1990s and education for all (EFA) programmed of 2000s with some different forms. For example, NESP implemented general literacy programmed, focusing on 3Rs and functional literacy based on the themes of 3Rs continued.

About the literacy approach and definitions in Nepal the EFA global monitoring report 2006 mentioned, “Literacy is traditionally defined as, the three Rs (reading, writing and arithmetic) plus functionality” (UNESCO, 2006, P.157). The ministry of education in (2010) defined literacy as the ability to read write and understand a simple text written either in their mother tongue or national language.

Mathematics is developing from counting, calculating, measuring and systematic study of the shape and size of objects. Practical mathematics has been a human activity as far back as written document. History of mathematics described the

mathematics development period and understanding level of people. Most of them are Egyptian, Babylonian, Greek, Roman, Hindu etc. Many civilizations show the mathematics contribution in different way.

The ancient Egyptian mathematics was based on the classical techniques. The sources of Egyptian mathematics are Ahmose papyrus, Moscow papyrus, Rollin papyrus and Harris papyrus. By the study of these papyri we say that Egyptian people familiar with arithmetic's, algebra, geometry, and astronomy. The Babylonian, who lived in Mesopotamia, drew up tables of squares, square roots, cube roots, reciprocals, and some powers. They were adept at linear and quadratic equations and knew much geometrical construction. Greek mathematician Thales, Pythagoras, Archimedes and other contribute in Geometry theorem proof number system etc. Hindu mathematician also contribute in decimal number system, negative number, arithmetic and algebra.

In the beginning of 6th century the European people divert to religious and mathematical work was stop. After 14th, rebirth movement of mathematics was seen. Then from the 17th century modern period of mathematics is started. In the context of Nepal, before formal education system Bhaskaracharya II, Daibagya Bahadur, Gopal Pande, Chandra Kala Dhananjay was the famous mathematician of Nepal.

By department of education Africa, Mathematical literacy provides learners with an awareness and understanding of the role that mathematics plays in the modern world mathematical literacy is subject driver by life related application of mathematics. It enables learner to develop ability and confidence to think numerically in order to interpret and critically analyze everyday situations and to solve problems.

"Mathematical Literacy is an individual's capacity to identify and understand the role that mathematics plays in the world, to use, apply, analyze, process, interpret and communicate mathematical information, and solve problems involving that information in ways that meet the needs of the individual as a constructive, concerned, reflective and involved citizen" (McAskill, Holmes, Francis-Pelton & Watt, 2006, p. 62).

By National Research council (2001), level of math literacy is divided in to 5 groups. Where, numeracy refers to the application of mathematical understanding in daily activities at school, at home, at work, and in the community. It involves both

using mathematical skills and knowing how mathematics is used to solve problems. Discussion of more global transformations espoused in education today may enhance parents' understanding of changes in mathematics in general and numeracy in particular by providing the context in which calls for reform occur. (Zalm 2010)

Literacy groups are,

1. Conceptual understanding: understanding mathematical concepts, operations, and relations.
2. Procedural Fluency: skill in carrying out procedures flexibly, accurately, efficiently, and appropriately.
3. Strategic Competence: the ability to formulate, represent, and solve mathematical problems.
4. Adaptive Reasoning; the capacity for logical thought, reflection, explanation, and justification.
5. Productive Disposition; habitual inclination to see mathematics as sensible, useful, and worthwhile, combined with a belief in diligence and one's own efficiency.

Mathematics is widely used and more applicable subject in any field of human life. Mathematics is essential subject; it is also included in school curriculum and teaches in every school of world. It is also useful in psychology, geography, economics, management etc. So it is necessary to provide mathematics knowledge and skill further development of human thinking.

Mathematics achievement is defined in terms of obtained score from taught curriculum examination. Thus the mathematics achievement of children is obtained score from the taught mathematics curriculum examination. According to the dictionary of psychology, "accomplishment or attainment that which has been attained a specific level of proficiency in scholastic or academic work". In the development country achievement is going on broad not only limited with educational achievement, it is considered in the field of psychology, industries, business and medicine.

There are growing bodies of research on parent's education and child learning and achievement in mathematics. Parent's education supports and great influence on student achievement in mathematics. Every child spend more time at home than at school. The home environment of child obviously affects the children's learning. So every parent provide good environment for learning facility of their child that affect the school performance and higher performance in achievement. Parent's involvement outside of home environment, such as extra curriculum activities related to mathematics knowledge, general knowledge which also helps their children learning.

In the case of mathematics achievement there are several factors, which affect student's achievement. This factor may be teachers, school, family size, peer group, social environment, and individual difference of students, parent's occupation and parent's literacy. Among those factors parent's literacy is the most influencing factor on mathematics achievement of the child. Many research and researcher found that parent educational level related to subject score of the students. Children's mathematics achievement is affected by parent's supports and provides increased opportunity for the development of skills and concepts. More knowledge and assistance depends upon the parent's education level. Every child need socially acceptance morel standard which must be guided by their parents.

Parent's participation means participation in school education, helping their children, improving their school work by providing encouragement. Outside home parents serve as advocates for the school and they can play an active role towards government and police maker. Family literacy plays a vital role towards their children's learning. How to guide their children's, depends their literacy level. If family members are high level of literacy they can develop their child to their own thinking strategies and other literacy level family thinks different strategies to their children's learning. Higher level literacy family highly affects to their children's learning than that of others.

So many researches were done on parent's education and their children's achievement in mathematics. Such research finds that higher educated parent's children achievement in mathematics is higher than other. But it is not sure that mathematical educated or others. Only the math literate parents help to their

children's learning in mathematics correctly. So I checked parent's math literacy under the certain criteria and to find their children's achievement in mathematics.

Statement of the Problem

For the natural and conceptual learning of mathematics, students must get good involvement at home from primary level. Normally literate parents can guide their children at home in the lower secondary level. At the level of difficulty increases with the age of student.

This study mainly concerned with the mathematics achievement of students of grade VIII due to parents mathematics literacy level. Level of parent's literacy plays an important role to provide the guidance of their children. The study was seeking the answered of the following research questions.

1. How we measure the parent's mathematics literacy?
2. What is the condition of children's mathematics achievements according to their parent's mathematics literacy?
3. Is their relation between parent's math literacy level and student's achievement?
4. Does all parent's support to their children learning in mathematics?

Objectives of the Study

This study intended to accomplish the following objectives.

1. To find the relation between parents mathematics literacy and their children achievements in mathematics.
2. To determine the level wise relation between parent's mathematics literacy and their children's achievement in mathematics.
3. To analyze parent's literacy and their children achievement in mathematics under the parents supporting variables.

Significance of the Study

Parents are regarded as the first agency of education. Before going to school, children learn education from their parents. Children learn the discipline, manner, social work and how to talk with their family members, teachers and so on. Every child spends one-third time of a day in the school, and the remaining two thirds time outside the school mostly at home with his/her family members, such as father, mother, brother, sister and so on. Parents and environment for the child helping to construct and reconstruct his knowledge. Parents can be participated in their children's in three major ways: (i) as supports (ii) as teachers and (iii) as advisors, advocators and decision makes. The majority of the parents in rural part of Nepal are not aware of their responsibilities towards the education of their children. They think school and teacher are fully responsible for education of their children. Parent's involvement in mathematics education differs according to the person place and social environment:

Every study has their own importance, parent's math literacy and mathematics achievements provide good relationship between parents and their children. This study would be helpful for the teachers, parents, administrators, curriculum planner and policy maker for better achievement in mathematics. The study would be significant to find the answer of following pointed;

1. This study would helpful for finding the parents' mathematics literacy.
2. This study would provide the relation between parents' mathematics literacy and their children achievements in mathematics.
3. The study would help the parents to manage better learning environment at home.
4. This study would help to the teacher and education system.
5. These studies would help awareness for the parents to provide good education facilities within each community.

Hypothesis of the Study

Research hypothesis for this study were as follows:

1. Knowing the literacy status of parent's helps us to predict the condition of children's mathematics achievement.
2. Parent's literacy and student's achievement are depended variables.

Delimitation of the Study

The study was limited under the following points.

- a. Study was limited in mathematics subject only.
- b. Study was limited to grade VIII students of 6 government school in Taratal and Sanoshree V.D.C. of Bardiya district.
- c. This study was limited in 60 students and 60 parents from different government school.
- d. Only sample student's parents were included in this study.
- e. This study was excludes the variable like classroom situation student's I.Q. age, parent's occupation which has affect student's mathematics achievement.
- f. The analysis of the study was limited in percentage, mean score correlation.

Definition of the terms

Parents: Father or Mother of concerned child.

Government school: School run through the government and government provide the grants for salary and other purpose.

Achievement: Scored by the student in examination.

Mathematics Literacy: An individual capacity to identify and understand the role that mathematics plays in the world, to use, apply, analysis' process interpret and communicate mathematical information.

Numeracy: Application of mathematics understanding and work with number in daily activity.

Illiteracy: Those people are unable to keep their own daily record and also who has no any idea or concept of mathematics.

Chapter II

REVIEW OF THE RELATED LITERATURES

Review of the related literature refers to the study of theories and findings from the previously carried out researches, studies, books, papers etc. in other words, the study of the other related topic to make effective and more experimental is called literature review. This section includes the previously done research reports, findings of those researcher and related literatures. The study helps the researcher develop new idea for showing the review of related literature was made as follows.

Empirical Literature Review

Parent's Involvement and Mathematics Achievement

A research on the topics “Effect of parental Involvement in Education” with the objectives was in what ways parental involvement at Combretum Trust School affects their children academic achievement. This research was qualitative research with purposive sampling taken seven parents of class 11, 12 students. The main tools of this study were open interview with guided by questionnaire and data analysis method was triangulation method. Then the research have finding followings facts the parents, the researcher spoke with consider education for their children and they are all highly involved with their education. They all expressed their desire to follow their child's progress closely and to know that is going to on at school. They all have regular discussions with their children about schoolwork and school related matters, and high expectations about their children's education. Most of the parents also feel they have a good relationship with the school. The parent considers homework to be important and do their must to assist their child when necessary. In addition, every parent expects to know now his or her child when necessary. In addition, spends his/her time out of school and with whole. (Erlendsdottir (2010))

Parent's Education and Achievement

The students pass their must of the times of their home. The children learn many things by their parents. If the parents are literate, morel and have good character, their children follow the same behavior. If the parents have bad behavior

and are illiterate, their children learn that behavior from their parents. There is not only the role of teacher in learning process but also of the parents awareness, education, their way of handling and guiding are the main factors to determine the child learning.

A study on the topic “A comparative study of achievement in mathematics of primary level students related to the effect of parents education status” is the mathematics achievement of grade V students of Saptari district. Out of 290 primary schools, 15 schools were selected randomly. Including 10 student in his research from each school he held achievement test paper. The mean and standard deviations were calculated. The t-test with one tailed test, level of significance at 0.05 was used. The finding of this study showed that the mathematics achievement of educated parents children, were higher than literate and illiterate parent’s children. (Chaudhary, (2000))

Master thesis on the topic “student achievement on mathematics according to their parents education of Dalit student” in Kailali district including 120 students in grade V of public school and found that mathematics achievement of the educated parent’s children were found higher than that of literate and illiterate parent’s children. Similarly mathematics achievement of literate parent’s children is higher than that of illiterate. (Rasili, (2012))

A studied on the topic, "Relation between parental education and student achievement" focused to find out the significance difference between influence of parents education and achievement in mathematics of higher secondary students. He used survey design as well as quantitative research. The total sample was 150 students from 5 different higher secondary schools in Taluk of Namakkal district. He used achievement test with multiple choice questions. Statistical techniques were Mean, SD, t-test, and average was used for analysis of the data. He concludes that there was no significance difference between literate and illiterate mothers or fathers of higher secondary students with respect to influence of parents education. (Selvam, (2013))

Parent’s Home Related Variable and Achievement

A research study on the topic “A comparative study of the achievement on mathematics of primary level students related to parent’s income”. His main target

was to compare the achievement of the primary level students in relation to their parent's income and orient the parents to helping at home. He used descriptive survey design, as well as quantitative research, taking 88 primary level students as sample in Nirmal pokhari V.D.C. in Kaski district. Before administering the real test he has taken a pilot test among 15 students of Janajoty primary school Panga. The reliability coefficient was 0.87. For the data he visited chosen school and administers the test. The ANOVA test is the analysis procedure. He showed that high income student achievement significantly higher than middle income and lower income students. (Adhikari, (2001))

Study on the topic "effect of socio- economic status on mathematics achievement". The study focused to find the correlation between socio-economic status and mathematics achievement. He used descriptive survey design as well as quantitative research. The total sample of the study was 84 students of grade III of Dura and Gurung community from class V public school in Lamjung district. Mainly two tools, student achievement test and parent's questionnaire. The mean standard deviation and correlation, multiple regression were used for analysis data. He concludes that mathematics achievement of Gurung student found to positively correlated with father education. But the other variable was negatively correlated with mathematics achievement. Similarly, mathematics achievement of Dura student positively correlated to father education. But the other variable was negatively correlated with mathematics achievement. (Neupane, (2006))

Research entitled "Effect of Home Environment of students' Achievement in Mathematics at secondary Level: A case study on Kami students' in Salyan district". In this study, the researcher has used semi-structure, face-to-face interview with two mathematics teachers, five Kami students', their parents and classroom observation. This study is descriptive and qualitative nature. The researcher found that effect of the various home environment factors such as parent's education, parent's occupation , social tradition, family size, poverty and load of household work where the main cause of affecting Kami students' achievement in mathematics at secondary level. All the researcher carried out as far have conclude that different factors at home environment show a close relation with the achievement of student's on mathematics. The researcher is an added investigation in series of researchers concerning family

environment and student's achievement on mathematics. The researcher is different than the earlier papers due to three reasons. Firstly, it does not take any one variable, rather it aims at using five different variables (parents education, parents profession, parent's time to children, tuition at home, entertainment time) affecting family environment. Secondly, this research will be done in the lower secondary level. Thirdly, it has taken into consideration both public and private school in course of the research process. (Rawat, (2011))

On the basis of above reviews it may be referred that parental involvement in the children's mathematics learning process is one of the critical issues in the context of Nepalese school education. Some empirical researches related to this topic also were reviewed. They were describing in the following paragraphs.

Parent's Involvement in Mathematics Education

Parental involvement in mathematics education has been a topic of interest for many years among those who are concerned with improving academic achievement for children (Hoover-Dempsey and Sandler, 1997). After reviewing the literature, Henderson and Map (2002) indicate that report cards and grades, grade point averages, most commonly define student achievement enrolment in advanced classes, attendance and staying in school, being promoted to the next grade, and improved behavior.

Many researchers recognize the important role a strong positive bond between homes and schools play in the development and education of children (Sanders and Sheldon, 2009; Richardson, 2009; Sheldon, 2009; Edwards and Alldred, 2000; Henderson and Berla, 1994). The theories put forward have been supported, and reaffirmed, by numerous studies that have shown that good cooperation between schools, homes and the communities can lead to academic achievement for students, as well as to reforms in education. Research has also shown that successful students have strong academic support from their involved parents (Sheldon, 2009). Furthermore, research on effective schools, those where students are learning and achieving, has consistently shown that these schools, despite often working in low social and economic neighborhoods, have strong and positive school-home relationships (Sanders and Sheldon, 2009; Sheldon, 2009). More importantly, these

effective schools have made a real effort in reaching out to their students' families in order to bring about liaison and cooperation.

Bryk and Schneider (2009) maintain that schools become successful when a strong and positive relationship among students, parents, teachers and the community has been established. All students are more likely to experience academic success if their home environment is supportive (Sanders and Sheldon, 2009; Henderson and Berla, 1994). The benefit for students of a strong relationship between schools and homes is based on the development of trust between parents and teachers. According to Bryk and Schneider (in Muscott et al., 2008), this trusting relationship occurs when teachers and parents respect one another and believe in the ability of the other person and his or her willingness to fulfill their responsibilities.

Research has regularly shown that with increasing parental participation in their children's mathematics education student success rate increases. According to the Department of Education (2004) in the United States, studies have shown that students with involved parents are more likely to earn higher grades, pass their class and be promoted, they are more likely to attend school regularly and graduate and go on to postsecondary education, irrespective of their socio-economic status. Jerry Trusty (in Henderson and Mapp, 2002) concurs with this, and claims that the level of parental involvement in high school influences the students' expectations to finish college. In addition, Obeidat and Al-Hassan (2009) maintain that not only do children with involved parents gain academically, but also they are also more likely to show improved behavior and to have better social skills.

Epstein (2009) alleges that there are many reasons for developing and establishing a partnership between school, family and community. The main reason for such a partnership is to aid students in succeeding at school. Other reasons are, for example, to improve school climate and school programs, to advance parental skills and leadership, to assist families to connect with others in the school and the community, as well as to assist teachers with their work. All these reasons emphasize the importance for parents to play an active role in their children's education and to keep a strong and positive relationship with schools.

Theoretical Literature

Constructivist theory

Constructivism is a theory to explain how knowledge is constructed in the human being when information comes into contact with existing knowledge that had been developed by experience. Vygotsky's socio-cultural theory of human learning describes learning as a social process and the origination of human intelligence in society or culture. He believed everything is learned on two levels first, through interaction with others, and then internalized into the individual's mental structure. His theory stresses that knowledge is co-constructed and that individuals learn from one another. Human beings learn also from more knowledgeable others.

Glaserfeld (1996) has explained Piaget's theory in terms of its epistemological understanding, where he concludes that knowledge springs from two sources: the person's "actions" which are grounded in and directed at objects in an environment and his/her "reflection" on objects, which embody the person's actions.

Two main principles, social nature of learning and zone of proximal development, derived from Vygotsky's theory have played an important role in shaping constructivist pedagogy known as modern constructivist thought. According to him, social learning process enables children having exposure to their thinking process through joint interactions with adults and more capable others, with regard to zone of proximal development, he mentions that each child is likely to have peer performance, when working together, on a given task at slightly higher cognitive level, exactly within the child's proximal development.

Social constructivism

Social constructivism is a highly effective method of teaching that all students can benefit from it, since collaboration and social interaction are incorporated. This type of constructivism was formed after Piaget has already described his theories involving individual or cognitive constructivism. Social constructivism depends on Vygotsky's theory. Lev Vygotsky, the founding father of social constructivism believed in social interaction and that it was an integral part of learning. Social constructivism is based on the social interaction with students in the classroom.

along with a personal critical thinking process. According to social constructivism, interaction is prominent to develop effective classroom.

Zone of Proximal Development (ZPD) is main theory of social constructivism of Vygotsky. He states that learning occurs within a Zone of Proximal Development which is the distance between learner's actual development and his/her potential development with guidance from "a capable other" or in collaboration with "more capable peers". Social constructivism is defined as a process by which students make meaning and the central role of their community through cultural and language, plays in this process. Learning is seen as a social and collaboration activity that is facilitated rather than directly taught by the teacher. This theory focuses that in the classroom every student should be active participator and to interact each other.

Social constructivism believes that, "the signs and symbols developed by particular cultural and the child's interaction in learning. These symbols are essential in developing higher mental function. In any learning, considers the relationship between the social, the culture, and the historical aspects inherent in forms of communication combine. To influence not just what is learned but also how it is learned –along the same line of co-operative learning, Vygotsky (1962) also used scaffolding in his theory to understand that children, learn more effectively when they have others to support them. Scaffolding is an assisted learning process that supports the ZPD or getting to the next level of understanding, of each student from the assistance of teacher, peers or other adducts. According to Vygotsky (1962), cooperative learning is an integral part of creating a deeper understanding. It is a part of creating a deeper understanding. It is a part of creating a social constructivist classroom. Students should not only work with other students in a social constructivist classroom. Students should not only work with teacher's one-one-one, but they should also work with other students."

According to social constructivism, for the effective learning we should develop that ZPD with help of scaffolding. For this scaffolding we adopt the effective teaching method in the classroom, so cooperative teaching strategy is the best method to teach the mathematics in the classroom on the basis of social constructivism.

Theory of Learning

According to Piaget, learning is what results from both mental and physical maturation plus experience. That is, development preceded learning. In contrast Vygotsky observed that learning processes lead development. Vygotsky maintained that "learning is a necessary and universal aspect of the process of developing culturally organized, specifically human, psychological functions." In other words, learning is what leads to the development of higher order thinking.

According to Vygotsky the two primary means of learning occur through social interaction and language. Language greatly enhances human's ability to engage in social interactions and share their experiences. "The most important fact uncovered through the ... study of thought and speech is that their relationship undergoes many changes." Initially, a child's new knowledge is interpsychological, meaning it is learned through interaction with others, on the social level. Later, this same knowledge becomes intrapsychological, meaning inside the child, and the new knowledge or skill is mastered on an individual level.

The previously mentioned idea of the zone of proximal development (ZPD) is central to Vygotsky's view on how learning takes place. He described this zone as, "the distance between the actual development levels as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. Vygotsky maintained that learning occurs just above the student's current level of competence. It follows then, that the copying student will have a higher performance when working with a more capable student.

The zone of proximal development works in conjunction with the use of scaffolding. "Scaffolding is a six-step approach to assisting learning and development of individuals within their zone of proximal development." Knowledge, skills and prior experiences, which come from an individual's general knowledge, create the foundation of scaffolding for potential development. At this stage, students interact with adults and/or peers to accomplish a task which could possibly not be completed independently. The use of language and shared experience is essential to successfully implementing scaffolding as a learning tool.

Theory of Transmission

Vygotsky defined those who are to teach as the "More Knowledgeable Other." The MKO is anyone who has a better understanding or a higher ability level than the learner, particularly in regards to a specific task, concept or process. Traditionally the MKO is thought of as a teacher or an older adult. However, this is not always the case. Other possibilities for the MKO could be a peer, sibling, a younger person, or even a computer. The key to MKO is that they must have more knowledge about the topic being learned than the learner does. Teachers or more capable peers can raise the student's competence through the zone of proximal development (ZPD).

Vygotsky's findings suggest methodological procedures for the classroom. "In Vygotskian perspective, the ideal role of the teacher is that of providing scaffolding (collaborative dialogue) to assist students on tasks within their zones of proximal development." During scaffolding the first step is to build interest and engage the learner. Once the learner is actively participating, the given task should be simplified by breaking it into smaller subtasks. During this task, the teacher needs to keep the learner focused, while concentrating on the most important ideas of the assignment. One of the most integral steps in scaffolding consists of keeping the learner from becoming frustrated. The final task associated with scaffolding involves the teacher modeling possible ways of completing tasks, which the learner can then imitate and eventually internalize.

Vygotsky recommended a social context wherein a more competent learner would be paired with a less competent one, so that the former can elevate the latter's competence. This social context promotes sustained achievement and cognitive growth for less competent students."Accordingly, students need to work together to construct their learning, teach each other so to speak, in a socio-cultural environment. In-class opportunities for collaboration on difficult problem-solving tasks will offer support to students who are struggling with the material. By interacting with more capable students who continue to mediate transactions between the struggling students and the content, all students will benefit.

The implications of Vygotsky's theories and observations for educators are several and significant. In Vygotsky's view, the teacher has the collaborative "task of guiding and directing the child's activity. Children can then solve novel problems "on the basis of a model he [sic] has been shown in class." In other words, children learn by solving problems with the help of the teacher, who models processes for them and his or her peers, in a classroom environment that is directed by the teacher. In essence, "the child imitates the teacher through a process of re-creating previous classroom collaboration. It is important to note that the teacher does not control the class with rule and structure; rather, the teacher collaborates with the students and provides support and direction.

Assignments and activities that can be accurately completed by a student without assistance indicate that the student has previously mastered the necessary prior knowledge. In the majority of classrooms this would be the conclusion of a unit; however, this is Vygotsky's entry point. However, as previously mentioned, the teacher must carefully group the student that "can potentially develop in collaboration with a more capable person."

In our research, we found limited references to Vygotsky's specific views on curriculum content. One exception involves the teaching of writing to preschoolers. According to Garton and Pratt, Vygotsky argued for shifting the teaching of writing to preschool. They explain that Vygotsky differentiated between two forms of speech: spoken and written. Vygotsky, as cited by Garton and Pratt, asserts that a child develops an understanding that spoken speech can be symbolized in writing by progressing from "drawing things to drawing speech." Vygotsky suggested then that the preschool curriculum should be designed so that it was organized to "ease child's transition from drawing things to drawing speech."

In sum, Vygotsky's findings suggest that the curriculum should generally challenge and stretch learner's competence. The curriculum should provide many opportunities to apply previous skills, knowledge and experiences, with "authentic activities connected to real-life environment since children learn much through interaction, curricula should be designed to emphasize interaction between learners and learning tasks.

Conceptual Framework

From the view of Epstein (1995), he mentions six key factors of parent's involvement regarding family. They are parenting, communicating, volunteering, learning at home, and decision making and collaborating with community. A child having good environment of parenting is always in front desk of his every steps. Good parenting keeps maintaining good environment for the children for betterment progress.

Parenting pertains to helping all families understand the development of both child and the adolescent. Communicating refers how to make and conduct an effective two-way communication from home to school programs and their children's progress. Parent's helps to the students from formal and informal way for school programs and student's activities is the volunteering of parents. How parents help to their children's homework and curricular related decisions and activities is the role of parents to their children's learning. Decision making refers to including parents in school's decision and to developing leaders and representative. Identifying and integrating community's services and resources to support and strengthen schools, students and their families by collaborating with the community.

Parent's Supporting Variable

Parents are the first teacher of the child. They want to guide their child for future progress in right way so they create good learning environment at home. Learning environment is one of the most important parts of the child progress. If parents provide good physical environment, love of their child, stimulate children, interaction with their child, and provide sufficient reading materials than such types of activity, child activate to learn and get good achievement in any subject.

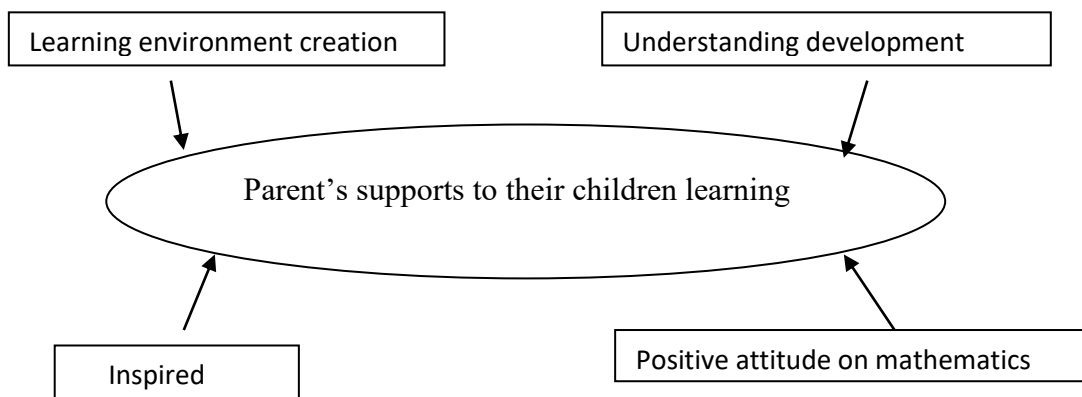
Parents who are illiterate, they cannot help their child but parents who are literate they support to learn. In such a way parents who are mathematically literate they can help their child for mathematics learning correctly. Mathematics literate parents who share to their child to use of mathematics in everyday life, to give clear guidelines for using mathematics material, to help as a problem solver, provide clear concept of confusion in mathematics, to ask the question by using the word what, how,

why and ask to check the answer by using different method such types of activity develop the understanding power of the student.

One of the most important facts to make interest in mathematics is inspire to the child, which make child deeply feeling in mathematics. For developing inspiration of their child parents provide interesting mathematics material, discuss about mathematics problem, important of mathematics, success of life ,life history of mathematician such activity child activate to learn mathematics by his/her sprite.

Child who has no interest in mathematics parents should play a role to make positive attitude on mathematics. So parents provide a chance for enjoy, competition, encourage learning from mistakes, to provide different approaches to solving problems, encourage to explain their difficulty of any problem to activate the child to learn mathematics by real life activities. Such activity provide the child stimulating environment and child are interested to learn mathematics. Children can develop their skills if parents support to their activities. Conceptual framework of this study depended on parent’s mathematics literacy. The most important factors are as below.

Diagram I: Supporting Variables



Parent’s Mathematics Literacy Format

For the parent’s mathematics literacy chaking, researcher made literacy criteria by the reference of UK wide measure of numeracy domain (www.nationalnumeracy.org.uk) which as;

Below level 1:

Task at this level require the respondent to carry out simple process such as counting, sorting, performing basic arithmetic operations with whole numbers or money, or recognizing common spatial representations in concrete, familiar contexts where the mathematical content is explicit with little or no text or disasters.

Level 1

Task in this level require the respondent to show an understanding of basic numerical ideas by completing simple tasks in concrete, familiar contexts where the mathematics content is explicit with little text. Task consist of simple, one step operations such as counting, sorting dates, performing simple arithmetic operations or understanding common and simple percents such as 50% and locating and identifying elements of simple or common graphical or spatial representations.

Level 2

Task in this level are fairly simple and relate to identifying and understanding basic mathematical concepts embedded in a range of familiar contexts where the mathematical content is fairly explicit. Task tend to include one-step or two-step processes and estimation involving whole numbers, benchmark percents and factorizations, interpreting simple graphical or spatial representations and performing simple measurements and spatial representation; and interpretation of relatively simple data and statistics in texts, tables and graphs.

Level 3

Task in this level require the respondent to understand mathematical information that may be less explicit, embedded in contexts that are not always familiar and represented in more complex ways. Task requires several steps and may involve choice of problem solving strategies. Task tends to require the application of number sense and special sense recognizing and working with mathematical relationship, patterns and express in verbal or numerical form and interpretation and basic analysis of data and statistics in texts and graph.

Level 4

Task in this level require the respondent to understand broad range of mathematical information that may be complex, abstract or embedded in unfamiliar contexts. These tasks involve understanding multiple steps and choosing relevant problem-solving strategies and processes. Task tends to require analysis and more complex reasoning about quantities and data, statistics and chance. Task at this level also require understanding arguments or communicating well reasoned explanations for answers and choice.

Level 5

Task at this level require the respondent to understand complex representation and abstract and formal mathematical and statistical ideas possible embedded in complex texts. Respondents may have to integrate multiple types of mathematical information where considerable translation or interpretation is required. Develop and work with mathematical arguments or models and justify, evaluate and critically reflect upon solution.

By the above category, researcher made five math literacy levels. Each level is considered as our context and the limited question which were made under each level consider the people are likely to present at this level. Researcher made 15 questions and categorized the obtained score. The task description shows the knowledge of each level and questions was made under such description. Then the task description and obtained score was also divided as follows.

Table No. 1: Mathematics Literacy Group Division

Level	Task Description	Score
1	Counting and basic operation with concrete and familiar contexts. Task consists of simple, one-step operations with whole number and simple arithmetic.	5-10
2	Calculation of whole number and decimal number, Percentage and fractions, understanding data present in table and simple estimation of concrete things.	10-20
3	Idea of doing mathematical problem, knowledge of formulation, concept of relation, ability to give reason under the answer and also understand the graphical interpretation.	20-30
4	Knowledge about statistics and chance, able to make a frequency table, understanding simple property, give reason and explain the answer or analysis of the data.	30-40
5	Integrate multiple types of mathematical information, understanding mathematics use in daily life, evaluation and justify capacity why mathematics is needed.	40-50

Parents who get the score less than 5 they were included in illiteracy groups.

Chapter III

METHODS AND PROCEDURES

This chapter describes the plan and procedure of the study. In this chapter, research design, population of the study, sample size and its procedure, instrument, validity and reliability of tools, data collection and data analysis procedure were described and discussed.

Design of the Study

This study entitled “parent’s mathematics literacy and their children mathematics achievement” at Taratal and Sanoshree V.D.C. of Bardiya district is based on descriptive survey design. The study was based on quantitative approach.

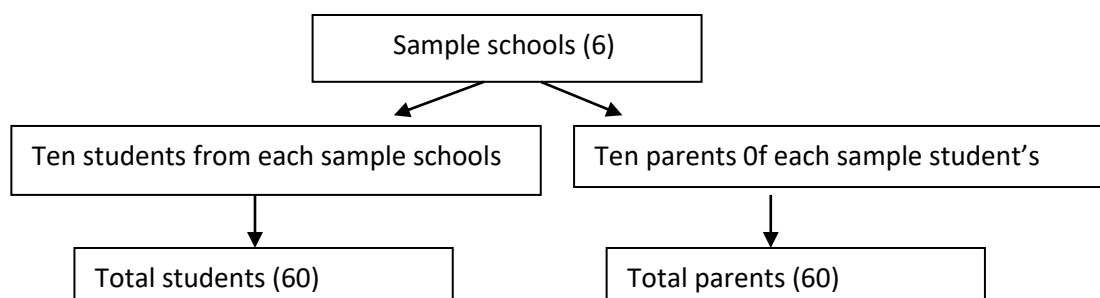
Population of the Study

The population of the study included the grade VIII students of Taratal and Sanoshree V.D.C. in Bardiya district. The researcher also had sound access to reach in this village to perform different tasks and fulfill the objectives of the study. Due to the time and cost limit it is also an essential to select this study area.

Sample of the Study

In order to collect the data, first of all I visited the district education office of Bardiya and took a list, then determined the schools of Taratal and Sanoshree V.D.C. purposively. There are 24 schools with three higher secondary, three secondary, three lower secondary schools and fifteen primary schools then I randomly selected 6 different schools and 10 students of grade VIII from each school by lottery method.

Diagram II: Sampling Process



Tools / Instrument

In order to find out the objective of the study it was necessary to use tools and instruments. To determine the answered to the research question, researcher used achievement test, parent's mathematics literacy question and questionnaire for students as the tools for data collection.

Achievement Test

Achievement test was the main tools for this study. It was consists 30 objective questions (APPENDIX-B). The test was depending on the specification chart from existing curriculum and text book of grade VIII. The questions was depends on the school's taught curriculum.

All the questions were objective types among them there were 10 questions which were directly related to the basic knowledge of student and each 10 questions weightage 1 marks for each correct answer and all of other twenty questions takes two marks for each correct answered. There were 35 questions in the beginning but among them 5 questions were removed after item analysis. To establish the reliability of the question it was tested in 15 student of Dharma Jyoti secondary school. The test was developed on the basis of the specification chart from existing prescribed curriculum and text book of grade-8. The questions were developed from three different cognitive domain.(APPENDIX-K)

Questionnaire

By the helped of research supervisor, I prepared 2 different sets of questions, parent's supporting questionnaire (APPENDIX-B) for student and questionnaire (APPENDIX-D) for their parents. Parent's supporting questionnaire was made under the 4 different variables which contained 10 Yes/No question for each variable. Parent's questionnaire was made as follows:

Table No. 2: Mathematics Literacy Scoring Strategies

Level of Mathematics Literacy	Number of Question	Score
One	5 multiple choice question	$5 \times 2 = 10$
Two	4 multiple choice question	$5 \times 2 = 10$
Three	3 short question	$2 \times 3 + 1 \times 4 = 10$
Four	2 question	$2 \times 5 = 10$
Five	1 question	$1 \times 10 = 10$

Table-2 shows that there were different question related to mathematics literacy. In mathematics literacy level 1, there were 5 multiple choice questions related to mathematics operation with one step problem. In level 2, there were also 5 multiple choice questions related to Calculation of whole number and decimal number, Percentage and fractions, understanding data present in table and simple estimation of concrete things. In both this two level each correct answer of each question weightage 2 marks. each question For level 3, there were 3 short questions, in which 2 were weightage 3 marks for each answer and 1 was 4 marks. The questions were related to knowledge of formulation, concept of relation, ability to give reason under the answer and also understand the graphical interpretation. For determine the knowledge of level 4 there were only 2 questions of marks 5. Which were related to statistics and chance and frequency table, For the highest level of parent's mathematics literacy; there was only one question of marks 10. This question related to knowledge of integrates multiple types of mathematical information and understanding mathematics use in daily life.

Validity and Reliability

The content validity of the test was established by mathematics education experts, school teacher and thesis supervisor. For the reliability of the test, I used pilot

test among 15 student of Dharma Jyoti Secondary School in Taratal V.D.C. of Bardiya. Before administering the test paper, the investigator instructs the student how to response the test paper. The parent’s questionnaire was developed by researcher himself with consisting fifteen questions on the basis of parents mathematics literacy. Questionnaire was developed by researcher himself and finalized it with the help of research supervisor and departs head. For the reliability of the study the researcher administrate the pilot study to the student of Dharma Jyoti secondary school. After piloting, for reliability chake. I applied Rulon formula, calculated value was 0.81. It indicated that the mathematical achievement test was reliable. The calculation of reliability table is presented in APPENDIX-F.

Item Analysis

The researcher administered at the test among 15 students of Dharma Jyoti Secondary School for pilot test. After testing, level of difficulty and power of discrimination of each item was calculate from 27% of higher scores and 27% of lower.

The difficulty level of an item is the index of difficulty, which is the percent of examination of examines who correctly answered the item. So it takes the value from 0% to 100%. The criteria of analysis of item difficulty level are given in table.

Table No: 3 Item Difficulty Level

Criteria	Item Evaluation	Remarks
Above 75%	Easy	Removed
75% - 25%	Good	Referred d-value
Below 25%	Difficult	Revisited

Index of Discrimination

The index of discrimination is also known as item validity index. It is the number which differentiates strong and poor students. It takes the value ranging from -1 to +1. The index of discrimination of each item is calculated by using the formula.

The item having p- value between 25-75 and the D-value above 0.19 were accepted otherwise the item were rejected or revised according to the corresponding p-value and D-index. The test was accepted, refined and reject some questions. The items having D value greater than 0.4 were excellent, D value greater than or equal to 0.3 and lesser than or equal to 0.39 were good. Then some questions was modified some were rejected and some were added. Thus the question was prepared for final administration. (APPENDIX-I)

Table No. 4: Accepted, Rejected and Refined Items

Accepted	Refined	Rejected
1, 2, 3, 4, 5, 6, 10, 11, 12, 14, 17, 18, 19, 20, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33	7, 8, 15, 21, 32, 35	9, 13, 16, 22, 34,

Data Collection Procedure

First researcher visited the district education office of Bardiya. Then, request for the list of schools and determine the school of Taratal and Sanoshree VDC. By sampling determine a sample school (APPENDIX-A) and I meet the head teacher of sample school. After meeting, tell them the purpose of my visit and study. By the co-operation of head teacher and teacher 10 students of grade VIII was select from each sample school. I made 30 objective questions for achievement test of students and 16 subjective and objective type questions for sample student's parents. The entire question, which were presented to the six different sample school's students and their parents by using symbol instead of their name. Researcher provide the achievement test for 6 sample schools sample students, all the school students were provide the equal time to take the achievement test and for supporting question , researcher

himself activate the student's and read the question clearly. Then student tick in Yes or No.

For parent's questions, to provide the sample student and told them to give the question form to their parents. For response they were asked by head teacher not to help your parents and say does it yourself and to return those forms next day. Next day I went to the school and receive the questionnaire which was given the day before. Parents who cannot write but they have a concept of simple operation were visited by researcher and fill the form.

Data Analysis Procedure

First researcher calculated the parent's score and categorized as, who obtained scores than 5 they were in illiteracy group, score more than equal to 5 and less than 10 were in level 1, parents who were obtained score more than equal to 10 and less than 20 they were in level 2, score more than equal to 20 and less than 30 they were in level 3, score more than equal to 30 and less than 40 were in level 4 and parents who obtained score more than equal to 40 they were in level 5. By the above process sample student's parents were divided into 6 different groups with illiterate parents for checking the mathematics achievement of students according to their parent's literacy. Parents were classified into mathematics literacy levels according to their scores.

The researcher analyzed the obtained data by calculating Pearson correlation from the sample data. The correlation was used to determine relation between parent's literacy and their children achievement. For the parent's supporting variable score was analyzed under the basis of 4 different variables, learning environment creation, understanding development, inspiration and positive attitude towards mathematics. For measuring the parent's supports to their children there were 10 Yes/No questions for each variable. By the scoring strategies the scores were tabulated and analyzed by percentage and mean score.

Chapter IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with statistical analysis and interpretation of collected data. It helped to draw conclusions and proceed to statistical data was collected through three different sets of instruments. The first type of instrument was the mathematics achievement test through which achievement scores was collected from eight grade students. The second instrument was the questionnaire which was used to collect the parent's mathematics literacy and also use questionnaire for student to determine the mathematics supports by their parent's scores obtained by each student in sets, arithmetic, statistics and algebra were calculated. The correlation was calculated by the score of parent's and their children score obtained in mathematics achievement test. This chapter mainly emphasizes on the analysis and interpretation of collected data from the related area. The entire questions were checked, classified and tabulated to make the study clear and effective. After collecting the data on the related topic, the analysis and interpretation have been made with the help of tables. The score of parents and students were collected by using achievement test for student and literacy checking question for parents.

The obtained scores of parents and students were divided into six difference groups. Students were divided by their parent's literacy group scores. Then correlation was calculated for finding the relation between each group's parents and student's achievement.

The collected data were analyzed under the following heading and the results from the analysis were interpreted.

1. Literacy level of parents according to the mathematics literacy score.
2. Total Correlation between parent's mathematics literacy score and student mathematics achievement score.
3. Correlation between parent's mathematics literacy score and student mathematics achievement score within each group.

4. To analyzed the different level of parents literacy supports to their children learning in mathematics under the score of four different criteria.

Mathematics Literacy Status of Parents

The literacy status of parents whose children studied in grade 8 at government schools were analyzed by the mathematics literacy score. The literacy status was categorized into six different literacy groups. The different mathematics literacy status of parents in six public schools was given below.

Table No. 5: Group of Parent's according to Literacy

Literacy status	No. parent's of each group
Illiteracy	4
level-1	8
level-2	21
level-3	16
level-4	9
level-5	2

The analysis of information mention in the above table was the parent's mathematics literacy level. For such level parents who were unable to solve simple one steps problem related to mathematics operation they were lies in illiteracy group and such parent's score is less then five. By the research process only four parents were in this level.

For mathematics literacy level one, parents were able to solve basic operation consist of simple one-step problem. Parent's who were able to score more than equal to 5 and less then 10, they were lies in this level. By the data,8 parents were able to score in this level. The parent's who were able to calculate whole and decimal number, percentage and fraction and understanding simple data presented in the table

were in level two. After research maximum numbers of parent's were in this level. Twenty-one parents out of 60 parents were found in level 2.

Knowledge of mathematics formulation, concept relation, ability to give reason and also understand the graphical representation was the task of level 3. For this level, 16 parents were in level three. In level four only 9 parents were found fourth level mathematics literacy. They scored more then equal to 30 and less then 40. Parent's who were in this level they have knowledge about statistics and chance, able to make a frequency table and ability to explain the answer.

For the high or fifth level parent's mathematics literacy, determine the knowledge about integrating multiple types of mathematics information, understanding mathematics use in daily life, evaluation and justification about the need of mathematics. For achieving the knowledge of this level and obtained the score less then equal to 40 were in this level. From the research survey sample data only 2 parents were found in this level.

Only two parents were high mathematically literate and maximum number of parent's were in second level mathematics literacy. Only four parents, who were illiterate, and cannot read and write,

Total Correlation between Parent's Mathematics Literacy Score and Student Mathematics Achievement Score

The objectives of the study were to find out the correlation between the parent's mathematics literacy and their children's achievement in it. There were 60 parents and 60 students who were participated in research sample. By the test, both parent's math literacy and student's achievement score were divided as parent's literacy score. The correlation between all the parent's and student's score was given in table 6.

Table No. 6

Correlation between Parent's Mathematics Literacy Score and Student Mathematics Achievement Score

	Parent's core	Student's score
Parent's score; Pearson correlation	1	.728
Sig. (2-tailed)	.	.000
N	60	60
Student's score; Pearson correlation	.728	1
Sig. (2-tailed)	.000	.
N	60	60

The table shows that the Pearson product moment correlation was run to determine the relationship between parent's mathematics literacy and their children achievement in mathematics. By the Pearson calculation, the correlation was found 0.732 which is closed to one. This shows that there is strong positive correlation between parent's mathematics literacy and their children achievement. Where the student score is depended variable and parent's literacy is independent variable. The result is significant at 0.001. It means increasing or decreasing in parent's mathematics literacy do significantly increasing or decreasing in student's achievement.

Group wise Correlation between Parent's Mathematics Literacy Score and Student Mathematics Achievement Score

The score of parents and students was divided in to six different groups by the parent's literacy score. After dividing the group, the sample of students and parents was small size group, so each group is not significant for the test. Test for more than

10 sample, researcher combined illiteracy group and level one and also combined level four and five. By combined such group, each four group has more than ten samples. Then researchers used Pearson correlation test. The relation between each group within parents and students score was given in the table below.

Table No.7: Correlation Result of each Group

Correlations					
		st.Level1	Std.Level2	Std.Level3	Std.Level4
Pill and PL1	Pearson Correlation	0.32			
	Sig. (2-tailed)	.026**			
	N	12			
PL2	Pearson Correlation		.34		
	Sig. (2-tailed)		.046**		
	N		21		
PL3	Pearson Correlation			.48	
	Sig. (2-tailed)			.064	
	N			16	
PL4 and PL5	Pearson Correlation				0.89
	Sig. (2-tailed)				0.000**
	N				11

The correlation result shows that there was positive correlation between all level parents' literacy and their children achievement score. In this table level one show that parents who were able to solve mathematical operation with one or two steps and score obtained less than ten. Correlation of this level is .32 which is positive but low correlation. Also the level 2 has positive correlation with .34 but low level relation which is slidely increased then level one. The correlation of level 3 was very closed to 50% which shows that there is low level correlation but it is very close to high level correlation, level four shows that there was very high correlation with correlation coefficient 0.89.

By comparing the result with this correlation coefficient, the correlation between illiterate parent and level one and level two had very low correlation but it was in increasing order. The correlation between level three student and parents was slightly increasing and it is very closed to high level correlation, and level four had very high correlation. It shows that the parent's who were mathematically literate; their children get high marks in mathematics. It shows that the parents who were illiterate their children get low marks. this correlation result shows that parent's mathematics literacy and student's achievement score has positive correlation. It means that if parent's mathematics literacy score is decrease then students score is also decrease and if parents score is increase then student's score is also increase.

Analysis of Different Level of Parents Literacy Supporting Variables

Parents are usually play important role in the learning behavior of children. Many researchers have identified that the educational qualifications of parent's is a good predictor of academic achievement. Like as in it research parent's mathematics literacy directly related to the achievement of the child. This research has tested four variables which depend upon the parent's role. To create learning environment, to develop understanding in mathematics, inspiration, motivation towards mathematics, this variables directly supported to the student achievement. In this research, researcher says that achievement in mathematics can be improved addressing this variables. It made substantial difference in student's achievement. These selected variables were analyzed by tabulated score.

The tabulated score shows that the student's response score of 10 yes questions of each variable. Zero the response No for all 10 questions for each variable. The student can get 10 marks for every variable if student get all supports by their parents otherwise student cannot get 10 marks.

Learning Environment Creation

Environment is one of the most important factors affecting mathematics achievement. In each four different level this variable is positively occurrence in achievement score. By the research data, mean score of learning environment was 6.85 which was higher than other variables. This shows that maximum number of

students was found have a good learning environment. By percentage score, maximum number of student get more than 60 % support by their parents and also their mathematics score higher than that of the students who were have no good learning environment. Some students who were have a good learning environment but mathematic achievement is poor. like as the data , the student N5, S5 who were have 100% learning environment but their achievement score is so poor and the student S9, Nh5 have 40% and 50% learning environment but their mathematics score were found more than 50%.

By the study, researcher found that the student who has got low marks in mathematics, their learning environment at home was not so good. This told that the learning environment is one of the factors affecting in mathematics achievement.

Understanding Development in Mathematics

By the data, the researcher found that the supporting mean score of the variable was 4.68. Which was less than learning environment creation and inspiration, but it is more than positive attitude development in mathematics. Only 23 students get more than 60% support by their parents. All the student in illiteracy groups was get no supports for understanding development by their parents. Student N6 and Ns2 were get 90% supports by their parents. Due to the parent's poor mathematics literacy more student did not get chance to learn mathematics by understanding. Parents who had low level of mathematics literacy they were unable to support to their child. Under the basis of 10 questions response, maximum numbers of parent's were unable to provide an example of related problem. But maximum numbers of student were encouraged by their parents to learn mathematics with understanding.

Parents who were literate and can helped their child for mathematics understanding; their child got high level of mathematics achievement this is showed by the raw score of the students. By obtained score we can say that the students who get low mark; their parents were low level of mathematics literacy or illiterate. This say that parents who were mathematically literate they only can help their child.

Inspiration

By survey data, researcher found that the mean score of the variable inspiration to mathematics was 5, which was more than understanding development in mathematics and positive attitude towards mathematics. All the 60 students, 28 students get more than 60% supports by their parents. Among those students only N6 get 100% supports for inspiration to learn mathematics and G4, Nh1 and Nh3 get no support by their parents. Due to the lack of proper understanding, parents were unclear how to inspire. Maximum number of parents was unable to provide the knowledge about mathematician and their contribution to their child. But maximum numbers of parents provide inspiration to their child to provide reward.

Inspiration means to motivate somebody by heartily in mathematics. The parents who were able to give quite well impressed in mathematics of their child, their children were get high marks in achievement test. It shows that inspiration play a role towards the children to learn mathematics well and give potential energy to understand mathematics and increase the achievement score.

Positive Attitude towards Mathematics

The mean score of this variable was 4.57 which were lowest mean score of other 3 variables. It means more students get low support in positive attitude towards mathematics. the student S2 and Nh2 get 100% support by their parents for positive attitude towards mathematics. The student Nh3, N5 and N2 were getting no supports by their parents. By the research data, we can say this was caused by the parent's mathematics understanding level. Some parents who were mathematically literate but they were unable to provide encouragement to lean mathematics to their child.

To develop positive attitude towards mathematics parents play the important role by their mathematics knowledge. By the data, student who get high score in achievement test were guided by these variables. Student who gets low score, their parents cannot support and they had no good mathematics knowledge. By this, we can say that parents who were mathematically literate and help or guide their child; their children get high score in mathematics.

By the above discussion or the collected data, students who obtained high score, their home environment was so good. Regarding the home related variable parent's mathematics literacy, physical environment, parent's role to develop understanding in mathematics and inspiration are predicting variable in student's achievements. The lack of parent's supports may be impact on student's achievement.

Chapter V

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

After the analysis and interpretation of collected data an attempt has been made to summarize the finding and recommendation for further study. The first section of this chapter presents the summary of the research and the second section presents its finding, third section present conclusion and last section present recommendation based in finding.

Summary

This study entitled “Parent’s mathematics literacy and their children achievement in mathematics” was concerned with the mathematics achievement of grade VIII student related to their parent’s mathematics literacy. So the study was intended to answer the question whether the parent’s mathematics literacy affects the student’s achievement and was all parents’ supports to their children learning. The survey research design was adopted to achieve the purpose of the study. The population of the study consists of the student and their parents whose children were studying at grade eight students in government school. The researcher followed the random sampling to select the school. Six government schools were selected under this study. From each school ten students were selected randomly and their parents also. The main tools of the data collection were questionnaire. The question of achievement test was verified by administrating pilot study to the students of Dharma Jyoti secondary school. The collected data were analyzed by using correlation and the parent’s supporting was analyzed by raw score of data.

Findings

After collecting the necessary data, the analysis and interpretation were done by using statistical procedures. From analysis and interpretations of the data, following findings were found,

- There is significant difference in mathematics achievement of students according to their parent's mathematics literacy level.

- The maximum number of parents were have second level mathematics literacy.
- There is high positive correlation between parent's mathematics literacy and their children achievement in mathematics.
- The coefficient of correlation between high level parents math literacy and their children's achievement in mathematics is .89 which is very closed to +1. This showed that there is very high relation between parent's mathematics literacy and their children's achievement in mathematics also the correlation between illiterate parents and their children's achievement is .32 which is very low correlation .
- Correlation result showed that the parents and students math score increasing orderly by the parent's mathematics literacy level.
- Maximum number of parent's cannot support to their children learning due to the lack of proper knowledge of mathematics.
- By the parents supporting variable score, parents who were illiterate and cannot provide learning environment, were unable to support in learning mathematics to their child, such children were poor to get high marks in mathematics.
- Parents who were mathematically literate and able to support to learning mathematics, give inspiration, develop positive attitude in mathematics, support in understanding development, such parent's child had high marks in mathematics.

Conclusion

From the above finding the conclusion is presented as,

- Parent's who have good mathematics literacy and are able to support to their children, the achievement in mathematics of their child is praise-worthy..

- Due to the lack of continuous guidance and help of parents, the children cannot achieve better score.
- Parents who were mathematically literate but they can't help their children; such parent's child math score was not as good as literate and supporting parents.
- If the parents are unable to give support to their children learning. It will hamper the children's result.
- Parent's literacy, parent's supports is more important in mathematics achievement of their child.

Recommendation

On the basis of finding, following recommendation is presented.

- This kind of the study should be conducted at all level of school and other subject as well.
- This study was limited to the student of grade eight in Bardiya district. So the similar study should be done in other classes, district and regional wise and national wise.
- These types of research are done on any classes and such class's literacy level of parents and their children achievement relation.
- Mathematics literacy status of parents affects the mathematics achievement of students so it needs to make all parents mathematically literate and conscious with the help of launching mathematics literacy programmed.
- This show that the mathematics achievement of the students of knows mathematics literate parents is comparatively below the high mathematics literate parents. So the concerned authority, educational policy maker and teacher in school management should pay specific attention to their students.

APPENDIX-A

List of Sample School

1. Nepal National Higher Secondary School, Dhodari
2. Nepal National Secondary School, Dhanaura
3. Nepal National Secondary School, Purnapur
4. Gurans Higher Secondary School, Sanoshree
5. Dharma Jyoti Secondary School, Dharmabasti
6. Shukra Higher Secondary School, Taratal

APPENDIX-B
ACHIEVEMENT TEST

CLASS- EIGHT

DATE:...../...../.....

SUBJECT- MATHEMATICS

TIME:.....

SCHOOL'S NAME:.....

CODE:.....

1. If $A = \{a, b, c, d\}$ and $B = \{b, c, d, e\}$, then $A \cap B$ is

2. If $A = \{m, n, o, p\}$ and $B = \{a, e, i, o, u\}$, then $A - B$ is

3. If $U = \{1, 2, 3, \dots, 10\}$ and $A = \{1, 3, 5, 7, 9\}$, then A' is

4. If $101_2 = 10_2 \times x + 1$, then x is

5. If $101_2 = 10_2 \times x + 1$, then x is

6. If $101_2 = 10_2 \times x + 1$, then x is

7. If $101_2 = 10_2 \times x + 1$, then x is

8. If $101_2 = 10_2 \times x + 1$, then x is

9. If $101_2 = 10_2 \times x + 1$, then x is

10. If $101_2 = 10_2 \times x + 1$, then x is

11. If $101_2 = 10_2 \times x + 1$, then x is

12. If $101_2 = 10_2 \times x + 1$, then x is

13. If $101_2 = 10_2 \times x + 1$, then x is

$$c) \frac{1}{5}$$

$$d) \frac{1}{5}$$

8 = hDdf dtbfff; +Vof150000dWo]75000n] dfq ef]6 v;fn] eg] slt k|ltztn] ef]6 v;fn] <

a) 50%

b) 45%

c) 40%

d) 35%

9 = ? 1500 sf] slt k|ltztn] ?300 x'G5 <

a) 15%

b) 18%

c) 20%

d) 25%

0f = ? 500 kg]{ 38Ldf 5% 5'6 lb+bf pQm 38L sltdf lsGg ;lsG5 <

a) 425

b) 450

c) 460

d) 475

t = gf]S;fg lgsfNg] z'q s'g xf] <

a) $L = S.P. - C.P.$

b) $L = C.P. - S.P.$

c) $L = C.P. + S.P.$

d) $L = S.P. \times C.P.$

y = /fdn] 50 j6f ank]gx? Pp\6f ank]g\sf] ? 12.50 df lsg]/ ? 15df a]Rbf slt gfkmf x'G5 <

a) 225

b) 125

c) 165

d) 105

b = 30 cf]6f sf] ?600 k5{eg] 4 bh{gsf] slt knf{ <

a) 860

b) 900

c) 950

d) 960

w = 4 jif{sf nflu jflif{s ? 5 Jofhb/n] /flvG5 eg] slt /sdsf] ld>wg ? 1500 x'G5 <

a) 1050

b) 1250

c) 1100

d) 1150

g = 3,4,5,6,5,6,5,4,3,6sf] dWoLsf slt x''''G5 <

a) 4

b) 6

c) 5

d) 3

k 9,5,8,4,2,3,1,6,5sf] la:tf/ slt x'G5 <

- a) 8
- b) 6
- c) 9
- d) 10

km 3,4,5,6,5,6,5,4,3,6,6/Lt s'g xf] <

- a) 5
- b) 6
- c) 3
- d) 4

a= 3,4,5,6,7,6,8,7,13,10,6,5,7 o; cf+s8fsf] dWos slt x'G5 <

- a) 4.25
- b) 6
- b) c) 5.75
- d) 6.75

e= tnsf cleAo~hs dWo l klwo cleAo~hs s'g xf] <

- a) $3x + 2y$
- b) xy
- c) $x \times y$
- d) $2xy$

d= $3X^3 + 2X^2 + 5sf]$ l8u|L slt x'G5 <

- a) 2
- b) 3
- c) 5
- d) 4

o= $(x + 3)^3sf]$ dfg slt x'G5 <

- a) $x^3 + 9x^2 + 27x + 27$
- b) $x^3 + 3x^2 + 27x + 27$
- c) $x^2 + 3x + 27$
- d) $x^2 + 6x + 9$

/= $(m+n)(m-n)sf]$ u'0fgkmn kQfnufp .

- a) $m^2 + n^2$
- b) $m^2 + mn$
- c) $m^2 - n^2$
- d) $m^2 + 2mn + n^2$

n= $a^m \times a^n = \dots\dots\dots?$

- a) a^{mn}
- b) a^{m+n}
- c) a^{m-n}
- d) mn

$j = 2x^2 + 12x$ sf] v08Ls/0f slt x'G5 <

a) $2x(x+6)$

b) $2x(x+3)$

c) $2x(x^2+6)$

d) $x(2+x)$

z. $a+b=7, ab=12$ eP a sf] dfg slt xf]nf <

a) 2

b) 5

c) 7

d) 3

APPENDIX-C ANSWER KEY

s	C
v	A
u	D
3	B
a	C
r	B
5	B
h	B
em=	A
,	A
6=	C
7	B
8=	A
9	C
Of	D
t=	B
Yf	B
b	D
w=	B
Gf	C
Kf	A

Kfm	B
a=	D
Ef	A
Df	C
o	A
/=	C
n	B
j	A
z.	D

APPENDIX-D

PARENT’S MATHEMATICS LITERACY QUESTION

Parent’s Math Literacy Checking Question

QUESTIONNAIRE

ljBfnosf] gfd =====

ljBfyL]{sf] ;+s)t=====

slff=====

cleefjssf] ;+s)t=====

>Ldfg\ cleefjs Ho',

d lZflffZff:q ul0ft laifo cGt{ut :gftsf]Q/ pkflwsf] nflu **cdf–a'jfsf] ul0ftLo ;flf/tfsf cfwf/df laBfyL{sf] ul0ft laifosf] pknAwLsf] ;DaGwsf] cWoog lzif{sdf zf]wkq ub}{5' . jt{dfg laBfnotxsf] lzlff ;+u ;DaGwLt /x]/ cfkm\gf aRrfx?nfO{ s;/L ul0ft l;sfpg], s;/L ltgLx?sf] ljBfno txsf] lzlffnfO{ Jojxf/Ls lhjg ;+u hf]8\g] eGg] s''/fnfO{ cfwf/ agfO{ tkfFOx?sf] ul0ftLo ;flf/tfsf] af/]df hfGg vf]h]sf] 5' . o; cWoogdf tkfO{ / tkfO{sf aRrfx?sf] gfd pNn]v ul/g] 5}g . pQm cWoogaf6 s]jn cdf–a'jfsf] ul0ftLo 1fg / aRrfsf] ul0ftLo pknlAwsf lar s:tf] ;DaGw 5 eGg] s'/dfq 5'6\ofpg vf]h]sf] 5' . o;af6 tkfO{x?sf] k|lti7f /**

JolQmTjdf s'g} klg lsl;dsf] cfFr cfpj] 5}g . o; cWoogdf cleefas zAbn] aRrfsf] a'jf-cfdf
nfO{ dfq hgfpj] ePsfj] k[Zgx?sf] pQ/ lb+bf a'af-cfdf :jod\ cfkm}n cGo sf]xL s;};+u
;/Nnfx / ;xof]u glno{ cfkm\gf] kl/a];df a'em]cg';f/ pQ/ lbO{ ;xof]u ul/lbgsf nflu xflb{s
cg'/f]w ub{5' .

=====

**Zf]fwsQ{fM l8NnL/fd
9+'ufgf**

tklznsf k[Zgx?sf] ;lx pQ/df l7s -v) lrGx nufO{ s]lx k[Zgsf] pQ/ klg n]lvlb'xf]nf .

s= Pp6f af:s]6df 7 cf]6f cf+k 5g\ / tkfO{;+u 4 c?cf+k 5g\ eg] ca hDdf cf+k]sf] ;+Vof slt
eof] <

- a) 10
- b) 11
- c) 12
- d) 13

v= tkfO{n] 12 cf]6f df5f ;dfTg' eof] / tkfO{;+usf] csf]{ ;flyn] 7cf]6f ;dft] eg] ca hDdf slt
df5f eP xf]nfg <

- a) 12
- b) 15
- c) 17
- d) 19

u= tkfO{ ;+u 15 cf]6f ;'Gtnf 5g\ To; dWo11 cf]6f a]lr;Sg' eof] eg]\ ca slt afFls xf]nfg <

- a) 4
- b) 14
- c) 13
- d) 5

3= 5 hgfnfO 3/3cf]6f sf b/n] s]s af+8\bf slt s]s cfjZos x'G5 <

- a) 15
- b) 12
- c) 14
- d) 10

%	ltd f] 3/df Hofldltsf ul0ftLo ;dfu Lx? 5g\ <		
^	ltdLnFO{ ;dodf laBfno hfg k l t ug'{' x'G5 <		
&	ltd f k Tos ls ofsnfkdf rf;f] /fVg'x'G5 <		
*	l6le x]g{sf nflu ;do 5'6\ofpg' ePsf] 5 <		
(ltdLnFO{ ul0ft l;sfpq s]xL;do vlr{g'x'G5 <		
!)	ltd f] u[xsfo{df d4t ug'{'x'G5 <		

cleefjsn] ul0ft l;sfO{ k|lt ?lrhufpg v]Ng;Sg] e'ldsf

s =;+=	syg	5	5}g
!	ul0ftsf] dxTjaf/]df ltdLnFO{ atfpg' ePsf] 5 <		
@	ul0ftn] b}lgs lhjgdf lx;fa lstfa ubf{ kf/]sf] k efa af/]df atfpg'ePsf] 5 <		
#	lhagdf ul0ftaf6g} ;kmNtf k fKtug]{ Aolmsf af/]df atfpg' ePsf] 5 <		
\$	s'g} ul0ft1\osf af/]df atfpg'ePsf] 5 <		
%	ltd f] ul0ftLo ;d:of ;DaGwdf rf;f] /fVg'x'G5 <		
^	ul0ftaf6 k fKt u/]sf] cfkm\gf] ;kmNtf ;'gfpgePsf] 5 <		
&	ul0ftdf ltdLn] k fKt u/]sf] ;kmNtf afkt s]lx k':/sf/ lbg'ePsf] 5 <		
*	s]lx lbg] cf;df ul0ft l;Sg k f]T;flxt ug'{'x'G5 <		
(7f]; lrhaf6 ul0ft l;sfpq] k of; ug'{'ePsf] 5 <		
!)	ul0ft l;sfpFbf ltdLnFO{ v'l;kfg{ ;Sg'ePsf] 5 <		

cleefjsn] ul0ft l;sfO{ k|lt ;sf/fTfnds wf/0ff lgdf{0fdf v]Ng;Sg] e'ldsf

s =;+=	syg	5	5}g
!	ltdLnFO{ ul0ft k9\g pTk l t ug'{'ePsf] 5 <		
@	ul0ftdf /fd f] c+sNofosf]df awfOlbg' ePsf] 5 <		
#	ul0flto ;d:of ;dfwfgsf lalaw tl/sf l;sfpq' ePsf] 5 <		

\$	ul0ft l;sfpFbf ltdLnfo{ ?lrnfu]sf] x'G5 <		
%	ltdLnfo{ v'l; x'g]ul/ ul0ft l;sfp\g' ePsf] 5 <		
^	ul0ftsf cfkm\gf /f]rs 50f af/]df atfpg' ePsf] 5 <		
&	cfk\mgf] ul0ftsf] ;kmntf jf c;kmntfn] cfk'mdf kf/]sf] k efa af/]df atfpg" ePsf] 5 <		
*	ltd]f ul0ftLo ;d:ofx? ;xh t/Lsfn] l;sfpg] k of; ug'{ePsf] 5 <		
(ul0ft l;sfpg b}lgs lhjgsf k To5 ls ofsnknfo k of]udf Nofpg' ePsf] 5 <		
!)	ul0ft l;sfpFbf ;xh t/Lsfn] a'em\g]u/L pbfx/0f lbP/ l;sfpg' ePsf] 5 <		

cleefjsn] ul0ftLo a'emfo{ lfdtf ljsf;df v]Ng;Sg] e"dLsf

s =;+=	syg	x'G5	x'Fb}}g
!	ltdLnfo{ ul0ftLo ;d:of a'emfpg 7f]; ;fdu]Lsf] k of]u ug'{x'G5 <		
@	;d:of ;dfwfgdf ltdLnfo{ cfPsf] Sgkm\o"hg x6fpg ;xof]u ug'{x'G5 <		
#	Pp6} ;d:odnfO{ lalaw t/Lsfaf6 ;dfwfg ug{ pTk]/Lt ug'{x'G5 <		
\$	ltdLn] lx;fa u/L;s]k5L s;/L eof] egL ;f]w\g'x'G5 <		
%	;DaGwLt ;d:of ;+u ;DaGwLt pko'Qm pbfx/0f lbg'x'G5 <		
^	lrq jf z'q k of]u u/] l;sfpg] k of; ug'{x'G5 <		
&	;d:of ;dfwfgsf k Tos r/0fnfo{ :ki6?kdf atfpg'x'G5 <		
*	c+sul0ftsf ;d:of l;sfpFbf b}lgs lhjgsf ls ofsnfk;+u hf]8\g'x'G5 <		
(ul0ftsf ;d:of ;dfwfg k5L To;nfO{ hfFRg nufpg'x'G5 <		
!)	ul0ft k9\bf a'em]/ k9\g k]/Lt ug'{x'G5 <		

Appendix -G

Parent's Score and Student's Score

Level	Code	Parent's score	Student's score
Illiteracy	G4	4	4
	Nh1	2	13
	Nh3	4	16
	Nh8	2	10
Level 1	D4	8	15
	D5	8	16
	N1	6	23
	N3	6	18
	N5	8	15
	Ns1	6	12
	Ns5	8	14
	Nh7	6	16
Level-2	D1	19	31
	D2	18	20
	D7	14	15
	D9	18	23
	D10	14	26
	G2	18	41
	G10	14	23
	N2	16	16
	N7	14	27
	N8	16	18
	N10	18	15
	S3	10	21
	S5	16	29
	S6	10	30
	S7	14	21
	S9	16	28
S10	14	26	

	Ns3	14	23
	Ns6	18	29
	Ns8	16	32
	Ns9	17	26
Level -3	G1	21	30
	G3	20	19
	G5	23	21
	G7	20	24
	N4	24	30
	N9	23	22
	Nh4	17	20
	Nh5	27	27
	Nh9	19	23
	Nh6	23	25
	Nh10	20	20
	Ns4	20	25
	Ns7	25	29
	Ns10	20	16
	S1	22	32
	S8	20	28
Level-4	G6	33	41
	G8	36	39
	G9	31	37
	D3	32	38
	D6	31	36
	D8	30	35
	N6	30	39
	S2	31	32
	S4	30	35
Level-5	Nh2	41	45
	Ns2	40	42

Appendix –H Parent’s Supporting Score of the Students

Group	Code	Learning environment creation	Understanding development	Inspiration	Positive attitude towards mathematics
Illiteracy	G4	2(20%)	0(0%)	0(0%)	1(10%)
	Nh1	2(20%)	0(0%)	0(0%)	1(10%)
	Nh3	1(10%)	0(0%)	0(0%)	0(0%)
	Nh8	5(50%)	0(0%)	2(20%)	4(40%)
Level-1	D4	4(40%)	4(40%)	2(20%)	2(20%)
	D5	7(70%)	6(60%)	5(50%)	3(30%)
	N1	5(50%)	4(40%)	1(10%)	1(10%)
	N3	7(70%)	5(50%)	3(30%)	2(20%)
	N5	10(100%)	2(20%)	1(10%)	0(0%)
	Ns1	3(30%)	2(20%)	3(30%)	4(40%)
	Ns5	6(60%)	2(20%)	2(20%)	0(0%)
	Nh7	7(70%)	2(20%)	4(40%)	4(40%)
Level-2	D1	7(70%)	7(70%)	8(80%)	7(70%)
	D2	8(80%)	6(60%)	5(50%)	6(60%)
	D7	6(60%)	6(60%)	7(70%)	7(70%)
	D9	6(60%)	5(50%)	7(70%)	5(50%)
	D10	7(70%)	7(70%)	6(60%)	5(50%)
	G2	7(70%)	4(40%)	3(30%)	2(20%)
	G10	9(90%)	2(20%)	4(40%)	5(50%)
	N2	8(80%)	0(0%)	0(0%)	0(0%)
	N7	5(50%)	6(60%)	7(70%)	5(50%)
	N8	7(70%)	2(20%)	3(30%)	2(20%)
	N10	5(50%)	2(20%)	4(40%)	4(40%)

	S3	6(60%)	7(70%)	8(80%)	7(70%)
	S5	10(100%)	7(70%)	6(60%)	7(70%)
	S6	9(90%)	5(50%)	6(60%)	2(20%)
	S7	4(40%)	1(10%)	2(20%)	3(30%)
	S9	4(40%)	4(40%)	4(40%)	2(20%)
	S10	6(60%)	3(30%)	4(40%)	3(30%)
	Ns3	8(80%)	3(30%)	4(40%)	1(10%)
	Ns6	8(80%)	8(80%)	9(90%)	8(80%)
	Ns8	6(60%)	7(70%)	6(60%)	6(60%)
	Ns9	5(50%)	1(10%)	1(10%)	3(30%)
Level-3	G1	7(70%)	6(60%)	4(40%)	3(30%)
	G3	5(50%)	5(50%)	6(60%)	6(60%)
	G5	6(60%)	6(60%)	7(70%)	9(90%)
	G7	6(60%)	4(40%)	3(30%)	3(30%)
	N4	5(50%)	5(50%)	5(50%)	1(10%)
	N9	9(90%)	4(40%)	7(70%)	8(80%)
	Nh4	7(70%)	4(40%)	5(50%)	7(70%)
	Nh5	6(60%)	5(50%)	4(40%)	2(20%)
	Nh9	5(50%)	3(30%)	3(30%)	4(40%)
	Nh6	7(70%)	4(40%)	9(90%)	8(80%)
	Nh10	8(80%)	3(30%)	4(40%)	1(10%)
	Ns4	10(100%)	8(80%)	7(70%)	6(60%)
	Ns7	10(100%)	6(60%)	6(60%)	6(60%)
	Ns10	9(90%)	8(80%)	3(30%)	3(30%)
	S1	9(90%)	6(60%)	8(80%)	7(70%)
S8	10(100%)	4(40%)	4(40%)	3(30%)	

Level-4	G6	7(70%)	3(30%)	7(70%)	7(70%)
	G8	10(100%)	6(60%)	8(80%)	7(70%)
	G9	10(100%)	8(80%)	8(80%)	6(60%)
	D3	10(100%)	4(40%)	6(60%)	5(50%)
	D6	10(100%)	8(80%)	8(80%)	9(90%)
	D8	10(100%)	8(80%)	8(80%)	8(80%)
	N6	5(50%)	9(90%)	10(100%)	9(90%)
	S2	10(100%)	7(70%)	7(70%)	6(60%)
	S4	10(100%)	7(70%)	8(80%)	10(100%)
Level-5	Nh2	10(100%)	8(80%)	9(90%)	10(100%)
	Ns2	10(100%)	9(90%)	9(90%)	8(80%)
Total mean		6.85	4.68	5	4.57

Appendix -I
Item Analysis Table

No of student no of question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
A	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
B	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1
C	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1
D	1	1	1	0	1	1	0	1	0	0	1	0	1	1	1	0	1	1
E	1	1	1	1	1	1	1	0	0	1	1	1	0	0	0	1	0	0
F	1	1	0	0	1	0	0	1	0	1	1	0	1	1	0	0	0	1
G	1	1	1	1	1	1	1	0	0	0	1	1	0	1	1	0	0	0
H	1	1	0	0	1	0	0	1	0	1	0	0	1	1	1	0	1	0
I	1	1	1	0	1	0	0	1	1	0	1	0	1	0	1	0	1	1
J	1	0	1	0	1	1	1	1	1	1	1	1	0	0	0	1	0	0
k	1	0	0	0	1	1	1	1	0	0	0	1	1	0	0	1	0	0
L	0	1	1	0	1	0	1	1	0	0	0	0	1	0	0	0	1	0
M	1	0	1	1	1	0	0	1	0	0	1	0	1	0	0	0	0	0
N	0	0	0	0	0	0	1	1	0	0	1	0	1	0	1	0	0	1
O	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	1
No of right answer	12	9	9	6	12	7	9	11	2	7	11	8	10	8	8	3	7	9
P -value	80	60	60	40	86	47	60	73	13	47	73	53	67	53	53	19	47	60
D-value	50	44	50	66	46	86	22	18	0	86	36	100	0	100	75	67	57	44

No of student no of question	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	Total
A	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	31
B	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	30
C	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	30
D	0	1	0	1	1	1	1	1	1	0	1	1	0	1	1	0	0	24
E	1	0	1	1	1	1	1	0	0	0	0	0	1	1	1	0	1	24
F	0	0	0	1	1	1	1	1	1	0	1	0	1	1	1	0	0	19
G	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	19
H	1	0	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	18
I	1	1	0	1	1	1	1	0	1	0	1	1	0	1	0	0	0	17
J	1	0	0	0	0	1	1	0	1	1	0	0	1	1	1	0	0	17
k	0	1	1	1	1	1	1	1	0	0	0	1	1	1	0	0	1	16
L	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	10
M	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	9
N	0	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	9
O	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	7
No of right answer	6	7	3	10	11	11	11	8	8	6	8	6	7	8	8	5	6	
P -value	40	47	19	67	73	73	73	53	53	40	53	40	47	53	53	33	40	
D-value	100	85	0	60	36	54	36	100	100	100	75	100	86	0	100	0	100	

Appendix- J**Formula Used in Data Analysis**

$$P - \text{Value} = \frac{R}{T} \times 100$$

$$D - \text{Value} = \frac{u_r - lr}{\frac{1}{2} \times T} \times 100$$

$$R_{tt} = 1 - \frac{Dd^2}{Ds^2}$$

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{N\sum X^2 - (\sum X)^2} \sqrt{N\sum Y^2 - (\sum Y)^2}}$$

Appendix-K
Specification Chart

Cognitive Domain					
S.N	Unit	Knowledge	Comprehension	Application	Total
1	Set		2	1	3
2	Whole Number		1		1
3	Square And Cube Root	1		1	2
4	Rationalization	1	2		3
5	Rational and Irrational	1	2		3
6	Ratio, Proportion and Percentage		3		3
7	Profit and Loss	1		1	2
8	Unitary Method		1		1
9	Simple Interest			1	1
10	Statistics	1	2	1	4
11	Algebra	3	1	3	7

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