

**IMPACT OF PARENTS INVOLVEMENT ON THEIR CHILDREN'S
MATHEMATICS ACHIEVEMENT**

**A
THESIS
BY**

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LETTER OF APPROVAL

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“Impact of Parents Involvement on Their Children’s Mathematics Achievement”

has been Approved in Partial Fulfillment of the requirements for the Degree of Master of Education.

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LETTER OF CERIFICATE

This is to certify that Ms Jamuna Devi Subedi, a student of the academic year 2066\2067 with the campus Roll no 1787, Exam Roll No 281265, Thesis Number:932 and T.U. Registration No: 9-2-48-3329-2005 has completed her thesis under my supervision, during the period prescribed by the rules and regulations of tribhuvan university, Nepal. This thesis entitled ***“Impact of Parents Involvement on Their Children’s Mathematics Achievement”*** embodies the result of her investigation conducted during the period 2070/71 in the Department of Mathematics Education Central Department of Education University Campus Tribhuvan University Kirtipur, Kathmandu. I recommend and forward that her thesis be submitted for the evaluation to award the degree of Master of Education.

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ABSTRACT

This is a survey research related to impact of parent involvement on their children's mathematics achievement. The prime concern of this study is to explore the 'impact of parent's involvement on their children's mathematics achievement'. The objectives of this study were to find the mathematics achievement of students with respect to their parent involvement, to determine the correlation between parent involvement and mathematics achievement and to find the effect of parent involvement factors in mathematics achievement of grade IX students. For this study, the researcher selection of schools was taken through random sampling 4 public schools with 80 students through the purposive sampling method from kaski district. Mathematics achievement test and parents questionnaire form are the main tools. Mean, Standard deviation, correlation co-efficient, inter correlation and Multiple Regression were used to analysis of the data related to parent's involvement factors.

After analysis and interpretation of the obtained data, the finding indicates that the mean achievement score of students from educated parents was higher than that of literate and illiterate parents. Similarly the mean achievement score of students from trade parents was higher than job and agriculture parents. Also it was found that the mean achievement score of students whose parents devoted more time to their children's study was found to be higher than that of less time devoted. Now it was found mean achievement score of students that the mathematics achievement of small family size children is better than large family size of children. There is significant effect of parent's education, parent's time (time provided by parent's) and occupation but there is no significant effect of parent's number of children in house on mathematics achievement. Parent's education, parent's time and parent's occupation were positively correlated with their children's mathematics achievement but number of children's at home is negatively correlated with their student's mathematics achievement. Similarly from the regression analysis of the data we can conclude that the parent's education is most contributing factor than others on student's achievement.

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LIST OF ACRONYMS

P.E : Parent's Education

P.T : Parent's Time

P.O : Parent's Occupation

M.A : Mathematics Achievement

P.N.C : Parent's Number of Children in House

S.D. : Standard deviation

SPSS : Statistical Package for the Social Science

CDC : Curriculum Development Center

EDC : Educational Development Service Center

Chapter - I

INTRODUCTION

Background of the Study

Mathematics is intimately involved in everyday life. Right from the start of human existence on the earth, the use of mathematics has been a part of human activities. It has practical values in human life. We can neither know things correctly nor can we have practical activities of calculation, unless we have knowledge of mathematics. It helps man to give exact interpretation to his ideas and conclusion. Benjamin Pierce one of the American trained Mathematician “Mathematics is the science that draws necessary conclusion”. According to Sidhu (1990), “Mathematics is a numerical calculation related to human life and knowledge”. It enables us to solve mathematics problem in our daily life, development discipline through cultivating the habit of concentration and self-reliance, prepare for technical service such as accounts, mathematics teaching, auditing, engineering etc, and reasoning so we take mathematics as a way of thinking, means of communication and tools of reflexive thinking. “Mathematics has been taken as the science of all science and technology.” Thus ,mathematics like a language is a basic tool of communication. It is an essential part of the development of science and technology. Thus mathematics like a language is a basic tool of communication. It also plays a vital role for the development of science and technology. Math helps people to understand and interpret very important quantitative as well as qualitative aspects of nature phenomena.

It is said that the first school of children is home. Parents are the children’s first and most influential teachers. Each and every child spends more time at home than school. Parents can support their children education by giving appropriate study time and space modeling desired behaviors such as monitoring, homework and actively tutoring their children at home. There are several factors which affects student’s achievement. These factors may be teachers, school, friend group, social environment, individual difference of

students and parent's involvement among those factors on, mathematics achievement of students.

In the field of education, mostly the educated parents take care of their children seriously and consciously rather than the literate and illiterate parents because they know the importance of education. On the contrary, illiterate parents do not care and value the importance of education. They only spend their children to school, but they do not care of them seriously about what they are studying. Educated parents make efforts to maintain their social life, relatively higher social status, privilege and access to different opportunities by the education of their family members. Hence educated parents enhancing are more likely to educate their children and encourage them to take occupation in formal sectors. Parent's occupation provides not only regular sources of family income but it is also a good clue to the identification of children's motivations, expectations, aspirations, needs and concerns. It affects the children's, so it access to educational and occupational status of the family members is directly correlated.

“The best way that the parents can contribute towards continued progress in the study of their children is to provide them with a secure and happy home and feel them that they are loved and well taken care of. And at the same time they must make available almost unlimited facilities for free reading room. From well graded children's books and magazines and provide opportunities for a great variety of games physical an agentives powers and get a balanced sense of emotional satisfaction. Time to study, encouragement to study and materials to study are necessary condition that can accelerate the process of the learning for the children”.(Malakar ,1989)

According to Epstein (2009), ample research evidence suggests that most parents want their children to succeed in school and in order for them to be good partners in their children's education, they desire to obtain more information from schools. Likewise, most students at all school levels, whether it being elementary school, middle school or high school level, want their families to be familiar and acquainted partners about schooling. The positive effects that parental involvement has on students' academic

achievement appear to be undeniable. Therefore, it should be a top priority for parents and schools to establish and maintain a strong partnership between schools and homes.

Generally child's learning is enhanced when schools encourage parents to stimulate their children's intellectual development. Numerous studies have shown that the home environment has a powerful effect on what children and youth learn, not only in school but outside of school as well. This environment is considerably more powerful than the parents' income and education in influencing what children learn in the first six years of life and during the twelve years of primary and secondary education. One major reason that parental influence is so strong is because the children spend more than ninety percent of their time from infancy throughout their childhood outside school under the influence of their parents. Therefore, ultimately the parents are their first and most important teacher. (Weinstein & Walberg, 1983, Peng & Wright, 1994, Walberg & Paik, 1997)

Parent involvement is a valuable component of any student's education. It is a well-established fact that parental involvement is linked to children's success at school. When parents are involved in their children's education at home, they do better in school (Henderson and Berla, 1994). The level of parent-school involvement is a better predictor of grades than are standardized test scores (Desimone, 1999). What is important is not the type of school, or who goes there, but the quality of its relationship with the families (Henderson, Anne T. and Berla, Nancy, 1994).

It is well research that parent's involvement status have great impact in mathematics achievement but in the Nepalese context no such research have been done to find out the impact of parent's involvement at grade IX student's achievement in mathematics. Therefore the researcher had undertaken this study to find impact of parent's involvement in mathematics achievement at grade IX students.

Statement of the Problem

This study was mainly concerned to access “Impact of parents Involvement on their children’s Mathematics Achievement”. Mathematics has been given high priority although it is also consider as a villain subject that produces frustration and low achievement in students. By considering the parent involvement as a main factor; the study intends to answer the following research questions.

- Does the parent’s involvement have positive impact on students’ achievement?
- Are there any relationship between parents involvement and their children’s mathematic achievement in secondary level ?

Objectives of the Study

Each and every study has its own objectives. So this study consists of the following objectives.

- To find effect of parents involvement in their children mathematics achievement.
- To analyze the relationship between parents involvement and mathematic achievement of their children.

Significance of the Study

Parent’s involvement is an important area of study in education. The parent involvement and family process provide a network social and intellectual force, which affect the student learning. The family process includes reading materials, supervising homework . Although different researches have been conducted regarding the factors that affect the achievement level of student, it is secrecy till now what the relationship of parent’s involvement to the achievement of their children. The study would be importance to find the answer of the question mentioned above. The majority of the parents in rural part of Nepal are not aware of their responsibilities towards the education of their children. In such situation schools can neither buy instructional material nor can they give extra time for material production. This study by exploring the factors which influence the student’s mathematics

achievement would help the teachers, parent, administrators, curriculum planners and policy makers to coordinate in an effective way. Hence this study has following significance

- This study would help to provide information to concerned agencies and educational planner within an educational system.
- This study would help to create a suitable home environment for students in future learning.
- This study would be helpful to find out the causes of failure of students in mathematics.
- This study would helpful to NGO, INGO and others for further research.

Statement of Research Hypothesis

The hypotheses formulated for this study are as follows:

- There is correlation between the parent's involvement and their student's mathematical achievement.

Delimitations of the Study

Every study has its own delimitations. So this study consists of the following delimitations:

- This study was be limited to Kaski district.
- This study was included only grade IX students of public schools.
- Reliability and accuracy of data was depending on parent's involvement and their response towards students' mathematics achievement.

Definition of the Related Term

Parents: Parents mean father, mother and family member of the sample students.

Students: The students studying in grade IX on academic year 2070 are known as students at public school of kaski district.

Public School: A school is government aided school which runs along with help of local people .Nepal government provide 100 percent of the salary of the teachers.

Achievement: The mathematics scores obtained by students on the achievement test constructed by the research, is known as achievement in this study.

Affecting factors: Parents education, parents time (provide by time),parents occupation and parents number of children in house etc are considered as the affecting factor for achievement in mathematics.

Chapter II

REVIEW OF RELATED LITERATURES

This chapter deals with the collection of information before and during the study period through the pervious thesis; books, journals and others research papers. Different source were used to site literature. Some thesis from CRC library and some from central library. Review the literature is the continuous process. It begins before a specific problem has been formulated and continues until the report is finished.

Empirical literature

Malakar (1989), on her article “parent’s involvement in education of children” mentioned a study of 250 California elementary schools reveled that parental involvement is related both to parents satisfaction and students achievements. “The curriculum of the home” that includes parents discussion about everyday occurrence monitoring and viewing television together, encouragement to read, to discuss the matters and emotional support and interest in the child’s world is reported to led together to academic achievement. In 29 controlled studies 91 percent of children in the program benefited when the learning environment at home is improved. The experimental children are compared to the children who did not participate in the program. It is found that home environment affected the outcome twice much as the socio-economic status does.

Similarl, Malakar (1989) on her study “Parental involvement in education of children” cited a Philippines study in which, “It was done by developing a multimedia instructional package (MMIP) for parents to help their children’s reading ability. The package contained six self-instructional modules. The illustrative story booklet and the audio cassette tape of stories, songs and nursery rhymes. The materials were provided to parents for information as well as for using them along with their children. The result showed that all the self leaving modules and others supplementary materials were useful and were effective in helping improve their children’s reading skills as well as their interest in reading.

Tiwari (2002), did a research on “seventy percent of the children reported that they help their parents in every day aspect of household activities ,more girls and boys reported that they are involved in any type’s economic activities of the household of their family”. The question is raised how the children continue their education. The answer of question totally depends on the attitudes of the parents when realize their children education.

Panta (2006), did research on “Parental Occupation and Their children’s Achievement in Mathematics: A study of Kathmandu District,” with the aim to show the difference of student’s achievement of mathematics according to their parent’s occupation. For this, two private schools were selected. The students of class eight were taken for the study. The study was based on descriptive as well as quantitative research design for which the researcher used post-test only equivalent research design. The total number of students were divided into four groups according to their parent’s occupation with the help of the records provided by the school administration and the teachers. From the total students, 15 students in each group were selected by using proportionate stratified random sampling. The achievement score of students were analyzed by using ANOVA and t- test in four different occupational groups. The result showed that the achievement score of the students differed according to their parent’s occupation.

Rawat (2011),did the research entitled “Effect of home environment on student’s achievement in mathematics at secondary level(a case study on kami students at Salayan district). In this study the researcher is 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 in the 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 household work load are main cause of Kami student’s achievement in mathematics at secondary level.

Bhusal (2007), did a study an“A correlation between Home Environment and Mathematics Achievement 15 Dalit families and their children were chosen from Nawalparasi and Chitwan district by using

purposive sampling survey form questionnaire were used to obtain the information at children. Mean, correlation coefficient was used to analyze the data. He found that there was positive correlation between the availability facilities at home and achievement of students as well as there was no remarkable relation identified with the achievement of family structure also found that a strong significance relation with parental expectation with student's achievement in mathematics.

Erlendsdottir (2010), did a research on the topics "effect of parental involvement in education" with the objectives was in what ways does parental involvement at combretum Trust school affect 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 finding following 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 on at school they all have regular discussion with their children about school work and relate matters and high expectation about their children's education most of the parents also feel they have a good relationship with the school. The parent consider homework to be important and to their must to assist their child when necessary. In addition every parent expects to know now his or her child when necessary.

Epstein (2002), used the Comprehensive School Reform Model (CSR) demonstrates how collaborative work produces positive outcomes. These studies were conducted in certain states, in selected school within the school districts. Educators, parents and community partners worked collaboratively on action teams to plan the curriculum. The programs are evaluated before being implemented in order to assess how well the plans connected family and school-community involvement.

Theoretical literatures

According to progressive learning theory parents and environment are helping for the children to construct and reconstruct their knowledge. Parents play the role to fascinator and monitor them but leave them freely to do their homework then children learn more easily. Modern learning theories incorporate the role of culture and other influences on experience in views of how people construct their understanding and develop their abilities (Crawford 1996, p. 143) there is now sufficient understanding of the relationship between the socio-cultural environment which learning activities occur, the qualities of the cognitive process that are functional for the activities at hand and the quality of the resulting outcomes to suggest a need for some changes in educational practice.

According to Becker and Epstein (1982) Parent involvement in learning activity is a strategy that was found by to increase the educational effectiveness of the time that parents and children spend together at home. Those schools in which parental involvement provides a lot of benefit to the students. “ How Strong Communication Contributes to Student and School Success: Parent and Family Involvement” shows that improved parental involvement not only leads to higher academic achievement, but to better attendance and improved behavior at home and school as well. When school and home work together collaboratively, and using a competent approach to education, it can make a huge difference in student achievement.

Epstein’s framework of six types of involvement are as follows: parenting which help all families establish home environments to support children as students; Communicating from home to school and school to home about school programs and student progress; Volunteering by organizing parent help and support. Learning at home by providing information and ideas from families about how to help students at home with homework and other curriculum-related activities; decisions and planning; Parents should be included in decision making; involve parent leaders and representatives; Collaborating with the community by identifying and integrating resources

and services from the community to strengthen school programs, family practices, and student learning and development.

Feeling the great importance that need to be given to parental support for children's education the center for educational Research Innovation and Development Nepal, conducted a three year research project on the Instructional Improvement in Primary Schools (IIPS).

The following are some of the suggestions given to a group of parents who are sample for research project daring to take get-together sessions.

- Parents should show enthusiasm for children's education and establish a good relationship with child.
- Children should be feeling free to talk and interact with elder.
- Parents should always encourage children in their studies by asking them about their lessons, school, teachers and other co-curricular activities and frequently visit the school where their children study and contact the headmaster or the concerned teacher.
- The home environment will be healthy and clean if possible a separate quiet corner will be provided for children to study at home.”

Epstein (1991) conducted a study that used data from 293 third and fifth grade students in Baltimore city who took the California Achievement Test in the fall and spring of the 1980-1981 school year. The students were in the classrooms of 14 teachers who varied in their used of techniques to involve parts in learning at home. The effects of parents involvement on students achievement were examined through data collection from parents, students and teacher over an extended period of time. The studies conclude that parents involvement resulted in higher students achievement, attitudes homework report card grades, and aspiration. Results from the study suggested that when teachers guided involvement and interaction more parents become involved in ways that benefited children.

A study conducted by Coleman (1966) demonstrated that students' achievement was correlated highly with family background factors such as

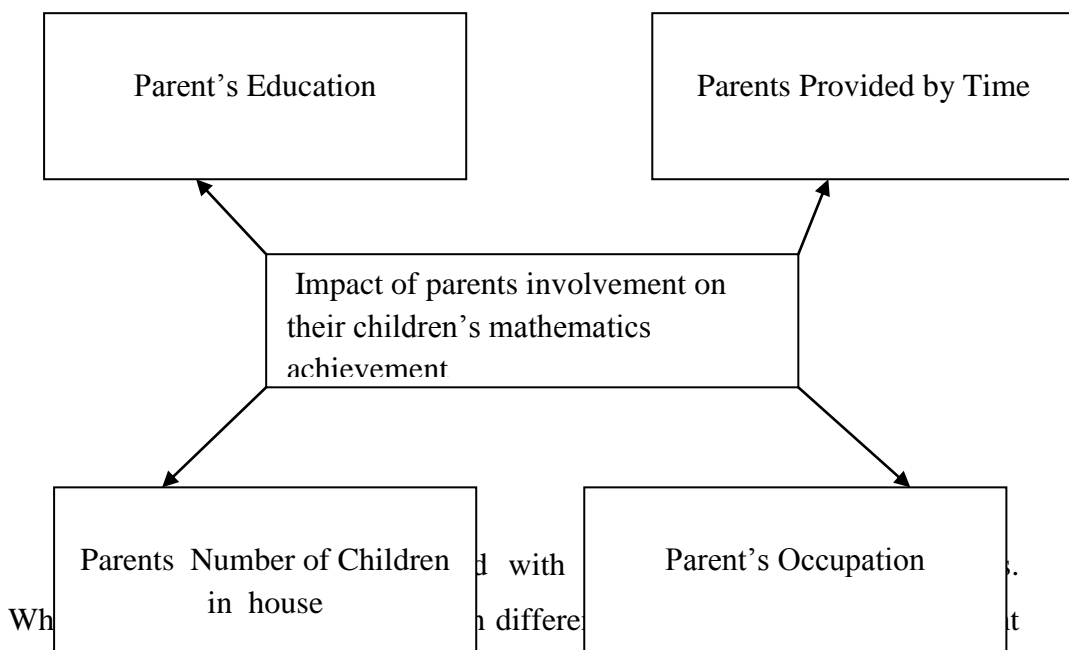
income parents educational attainment and family structure. A child attitude towards education may be shaped by the parent's level of education. Schwartz (1999) suggested that parents may be illiterate or have very little education and therefore not see the importance of doing well in school and furthering education. They may not understand why it is importance for their child to take advanced level courses as they progress through school. Although students can receive support and positive reinforcement at school, they may not receive the same support and reinforcement at home due to the lack of awareness from parents.

US National Educational Longitudinal Study (NELS) data base as Sui-Chu and Willms (1996) (cited above) because it is particularly rich in information relevant to parental involvement. The data affords many different conceptions of PI to be explored. Singh (1995) explored the effect of different components of parental involvement on the achievement of 8th graders. Singh identified four components of parental involvement namely; parental aspirations for children's education, parent-child communication about school; home-structure and parental participation in school related activities. It should be emphasised that 'parental aspiration' refers to the parents' hopes and expectations for the child's continuing education, 'parent-child communication' refers specifically to school related matters, 'home structure' refers to the degree of discipline exerted by the parents to insist on homework completion and to limit potentially distracting activities (e.g. watching T.V.) whilst 'parental participation in school' more self evidently refers to parent support for and participation in school and class functions. Singh showed that parental involvement in school activities had no effect on achievement whilst home structure had a slight negative association. Parental involvement in the form of parent-child discussions had a moderate impact. Parental aspiration had a powerful influence on achievement both directly and indirectly through discussion. To give some idea of the scale of this influence it can be compared to the influence of prior achievement. Prior achievement is usually the best predictor of pupils' present achievement. It is a good measure of all the previous effects of family background and the child's abilities.

Conceptual Framework

This conceptual framework is developed through with the help of several literatures related to this topic. This conceptual framework proposed to study the student achievement of grade IX. The researcher has intended to determine the variables that affect on mathematics achievement of grade IX children. Mathematical achievement is always affected by the different variable such as school related, home related as well as personal factors. Among them conceptual framework of this study was related to parents involvement which was shown below.

The main conceptual basis of this study from the model of (De Garmo et al, 1999 p.1233) parenting practices as mediators of educational achievement.



When the number of children in a house is high, the parents' involvement in their children's education is likely to be lower. This is because the parents have to divide their time and resources among more children. Similarly, the parents' occupation can also affect their involvement. For example, if the parents are working long hours, they may have less time to spend on their children's education. Therefore, the researcher decided to take a researcher project to conduct the study on student's achievement in mathematics on the basis of their parents involvement related factors.

Chapter III

METHODS AND PROCEDURES

The study focused on “Impact of parents involvement on their children’s mathematic achievement” in secondary level. All the independent variable are parents education, parents time(time provide by the parents), parents occupation and number of children in house where as mathematics achievement is dependent variable. This chapter includes design of the study, population of the study, sampling procedure and sample size, procedure for the selection of the sample, construction of instrument with their reliability and validity, analytical design of study, data collection procedure and data analysis procedure.

Design of the Study

Quantitative data provide numerical representation of the differences and relationship between dependent and independent variables which could be generalized to other educational setting in predictable way (Creswell 2003 p 75) so in this study researcher has used the quantitative researcher method. This study focused on “impact of parents’ involvement on student’s achievement at grade IX.” The study tried to analyze all the independent variables identified by the researcher like parent’s education, parent’s time, parent’s occupation, parent’s number of children in house. Mathematics achievement is depended variable. The researcher design of this study was survey . So the study was quantitative as well as descriptive in nature.

Population of the Study

The population of the study consisted of grade IX students and their parents of Kaski district in academic year 2070 BS.

Sampling of the Study

According to Wires man (2000, p270) a random sampling as “a probability sample in that every population member has a non zero probability selection this probability is the same for all population members. The selection of schools was taken through random sampling method . The researcher was selected four public schools from Kaski district. After selection of schools the

researcher was selected 20 students of grade IX from each school then selected was purposive sampling. Then the sample of the study was consisted of 80 students and their respective parents.

Construction Instruments for Data Collection

The following instruments are constructed by the researcher for the study.

- **Mathematics Achievement Test(MAT)**

The researcher used instrument for measuring mathematics achievement is Mathematics Achievement Test (MAT).for this study the researcher constructed an achievement test paper with the help of prescribed curriculum and textbook of secondary level of Grade IX mathematics. Specification chart that parent’s different level of cognitive domain of Benzamin Bloom. The test was consisted of 15(30%) items from knowledge level 18(36%) items from skill level, 7(14%) items from comprehension level and 10(20%) items from application level of cognitive domain. Similarly, items includes from 16(32%) from arithmetic, 13(26%) from algebra, 13(26%) from geometry see (Appendix A). The test items covering different area of mathematics and different level of cognitive domain are presented in the following tables.

Table 1

Area of Mathematics and Level of Cognitive Domain.

S.N	Area of mathematics	Level of cognitive domain				Total
		K	S	C	A	
1	Arithmetic	5	6	2	3	16(32%)
2	Algebra	4	5	2	2	13(26%)
3	Geometry	4	4	2	3	13(26%)
4	Statistics	2	3	1	2	8(16%)
Total		15	18	7	10	50
		30%	36%	14%	20%	100%

Where K=knowledge S=Skill C=Comprehension A=Application

Parents Questionnaire

Questionnaire form is another tools for the collection of data in survey research. According to the guidance of research supervisor the researcher

developed one set of questionnaire form and to collect the information respondents (parents and children) regarding to the parent's education, time, occupation and number of children in house. See (Appendix B)

Variables Define

Parent's Education

Parent's education is a predictor variable is a variable that is being manipulated in predictor in order to observe the effect on outcomes variables. Then categorized using the format of Nominal scales. The education of parents was scored according to motivation of parent's for the children to achieve creation level of education so educated parents children are high score of mathematics and similarly on. Now would be categorized as follows.

Scoring Parent's Education

S.N	Parent's education	Scores
1	Educated (above +2 level or above)	3
2	Literate (up to S.L.C. pass)	2
3	Illiterate (unable to read and write)	1

Parent's Time (time provide by the parent's)

The parent's to guide their children at home many hours in per day so parents of children increasing a mathematics achievement. So categorized using a format of Nominal scales would be categorized as follows

Scoring Parent's Time

S.N.	Time provide at home	Scores
1	Three or more than three hour per day	3
2	Two hour per day	2
3	One hour or less hour per day	1

Parent's Occupation

Parent's activity that serves as one's regular employment so time is fixed and income are regularly so parents movement of facilities at home

then their parents achievement higher than other. The categorized using the format of Nominal scales. Would be categorized as follows.

According Parent's Occupation

S.N	Parent's occupation	Scores
1	Job (service)	3
2	Trade	2
3	Agriculture	1

Parent's Number of Children in House

Parents and children live at home or tougher. Little children at home they many facilities provide many children. Now then categorized using the format of Nominal scales. Would be categorized as follows

Scoring Number of Children in House

S.N.	Number of children in house	Scores
1	Two children	2
2	Three or more than three children	1

Items Analysis

The research administered the test among 20 students of Shree Saraswoti Tika Higher Secondary School Bharat Pokhari for the pilot testing of achievement test. Before administrating the test paper, the researcher instructed the students how to respond the test. To finalize the items of the test, item analysis was done. Level of difficulty and power of discrimination of each item was calculated from 27 percent of higher score i.e. 6 students of higher score and 27 percent of lower score i.e. 6 students of lower score. Items analysis shows that the level of difficulty and discrimination index of each item in the instrument. P-value and D-value of each item is calculated from the tabulated 27 percent of the lowest scores of 20 students on the test using the given relation given in the (Appendix-C). Item number 1, 7, 8, 10, 19, 30, 32, 42, 45, and 48 whose D-value or P-value do not lie between 0.20 to 0.80 or below 25 percent to above 85 percent were cancelled. In this way items analysis were accepted for the final form in Appendix C. Hence the refined achievement test paper contains only 40 items (Appendix A).

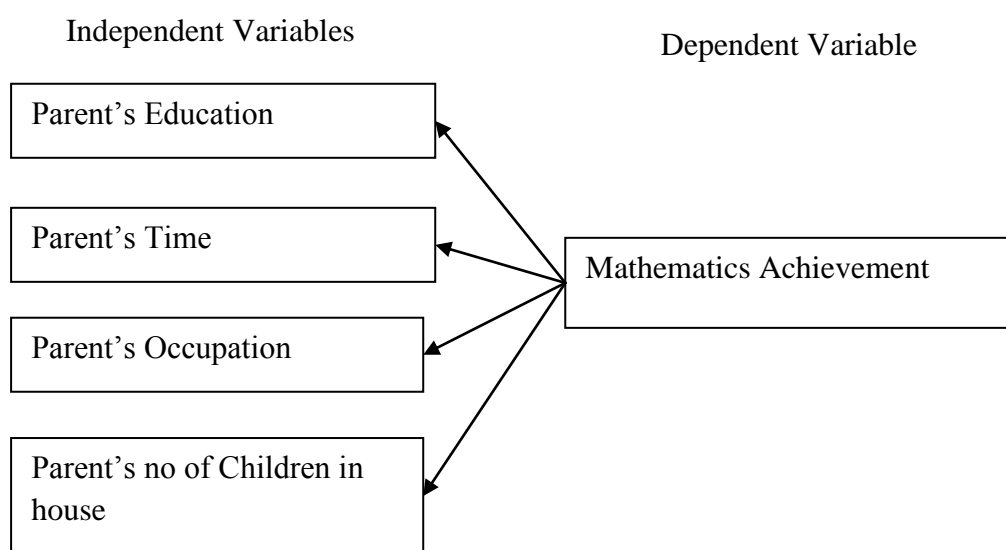
Validity and Reliability of the Tools

The content validity of the questionnaire would be established its approval from the mathematics education experts, Scholl teacher and thesis supervisor. For the reliability of the test the researcher carried out pilot test prepared 20 students of Shree Saraswoti Tika Higher Secondary School in Bharat Pokhari were taken for pilot test. Before administering the test paper, the researcher instructed the students how to respond the test paper.

To find the reliability in of the test paper the score of 20 students of the item analysis chart are identified by the letter in the first column of the table see in Appendix D. the score on the odd and even items of the 40 items, in the test are shown in the second and third column. From the calculation, the reliability co-efficient was found 0.792.

Analytical Design of the Study

This study was intended to make detail analysis of the factors that influence mathematics achievement of secondary level students. The multiple linear regression technique was also used fine the effect of different variables in mathematics achievement. The analytical design included regression equation pertaining to the effects of four major blocks of variable. (Parent's education, time, occupation, number of children in house).



The Relationship of parent involvement characteristics to mathematics achievement

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + \dots + E$$

Where

Y= Mathematical Achievement

x_1 =parent's education

x_2 =parent's time

x_3 = parent's occupation

x_4 = parent's no of children in house

b_0 = Intercept

b_i^k = least square regression co-efficient

E= Error term

Data Collection Procedure

After the construction of mathematics achievement test the next step was to administer it among the grade ix students of public school selected in the sample from Kaski district. The researcher met the head teacher explained in detail the purpose of the visit and sought permission and appointment of visit the school on next day. The tools for the study were administrated on a sample of 80 students from the school included in the sample. Before administrating the test, the researcher explained the answering procedure of mathematics achievement test to the students. The time allocated for completing the test was one hour. After, the time duration of examination the answer sheets were collected and scored by the researcher. Also, the parent's questionnaire from was given to the parents of sampled students fulfill it. In the case of illiterate parent's the researcher herself fulfill the form by asking included questions related to their education, time, occupation, number of children in house.

Data Analysis Procedure

The mean, standard deviation, correlation co-efficient, and multiple regressions were used for the analysis of data. The mean was used to find the level of mathematics achievement and standard deviation to find the

variability of mean. Correlation coefficient was used to determine the relation between dependent and independent variable. Multiple linear regressions were used to find the effect of independent variable on dependent variable. All statistical were determined by using the computer made SPSS version 16.0 program package.

Chapter –IV

ANALYSIS AND INTERPRETATION OF DATA

The data for the study were collected from grade ix students and related parents of sample students from the selected sample. Parent's questionnaire about parent's education, time, occupation, number of children in house and student's achievement test was used to find out the mathematics achievement score. The collected data were tabulated and analyzed for the study of attainment of objectives.

This chapter deals with the statistical analysis and interpretation of data obtained by using tools achievement test and parent questionnaire form of sample students and related parents of sample student. These data were tabulated and analyzed using mean, standard deviation, correlation co-efficient and multiple regressions. The data obtained by above mentioned tools were analyzed under the following headings:

- Mean and Standard Deviation of mathematics achievement of students by parents involvement of independent variables (parent's education, time (time provide by the parents), occupation, number of children in the house.
- Correlation between mathematics achievement of students and parent's involvement related variables.
- Inter correlation between mathematics achievement and parent's involvement related variables.
- Regression co-efficient of explanatory variable on mathematics achievement students.

Mean and Standard Deviation of Mathematics Achievement of Students by Parent's Education

The mean and standard deviation of the score obtained by the students according to parent's education are presented in the following table:

Table 2

Mean and Standard Deviation of Students Achievement by Parents Education.

Group	No of Cases	Mean	S.D.
Educated	12	35.75	7.36
Literate	54	25.65	6.96
Illiterate	14	22.93	7.28

From the above table it is shown that the mean score of student of educated, literate and illiterate parents are 35.75, 25.65, and 22.93 with the standard deviation of 7.36, 6.96 and 7.28 respectively. Therefore the mean score of educated parent's children is higher than the mean score of literate and illiterate parent's children. It is also shown that the mean score of literate parent's children is higher than those of illiterate parent's. It shows that mathematics achievement of educated parent's children is better than literate and illiterate parents children's.

Mean and Standard Deviation of Mathematics Achievement of Students by Parent's Time

The mean and standard deviation of the scores of students according parent's time is tabulated in following table.

Table 3

Mean and Standard Deviation of Students Achievement by Parents Time.

Group	No of case	Mean	S .D
1 hour	14	22.71	7.29
2 hour	56	26.98	7.78
3 or more than hour	10	30.60	8.44

The above table show that the mean score of students of their parent's given time i.e. 1 hour, 2 hour and 3 or more than hour are 22.71, 26.98 and 30.60 with the standard deviations of 7.29, 7.78 and 8.44 respectively. The mean score of the students whose parents were devoted more time to their children's study was found to be higher than that of less time devoted.

Mean and Standard Deviation of Mathematics Achievement of Students by Parent's Occupation

The mean and standard deviation of the scores obtained by students according to parent's occupation is tabulated in following table.

Table 4

Mean and Standard Deviation Students Achievement by Parents Occupation.

Group	No of Cases	Mean	S.D.
Trade	9	30.44	8.94
Agriculture	40	24.58	7.45
Job	31	28.32	7.48

The above table show that the mean score of students of their parent's occupation i.e. Job, Trade, Agriculture parents are 28.32, 30.44, 24.58 respectively, With Standard deviation of 7.48, 8.94, 7.45 respectively. The mean score of trade parent's children is higher than the mean score of job and agriculture parent's children and the mean score of job parent's children's higher than the mean score of agriculture parent's children. It shows that the mathematics achievement of trade family children is better than job holder parent's and agriculture family children.

Mean and Standard Deviation of Mathematics Achievement of Students by Parent's Number of Children in the House

Mean and Standard Deviation of mathematics achievement of students by parent's number of children in the house is tabulated in following table.

Table 5

Mean and Standard Deviation of Student's Achievement by Number of Children in House

Group	No of Cases	Mean	S.D.
Two Children	29	28.78	7.97
Three or more than	51	23	7.35

The above table shows that the mean scores of students of two children and three or more than three children are 28.78 and 23.00 respectively. Similarly the standard deviation of the score of standard is 7.97 and 7.35 respectively. The mean score of two children students is higher than that of three or more than three children and standard deviation of the achievement of 2 children is higher than 3 or more children parent's students. It shows that the mathematics achievement of small family size of children is better than medium and large family size's children respectively.

Correlation between Mathematical Achievement and Parent's Involvement Related Variables.

Correlation between mathematical achievement with and parents involvement related variables (Parent's Education, Parent's Time, Parent's Occupation and Parent's no of Children in a house) are presented in the table below.

Table 6

Correlation between Mathematics Achievement and Parents Related Variables

Variable	Correlation Co-efficient	Sig
Parent's education	0.42	0.062
Parent's time	0.29	0.069
Parent's occupation	0.22	0.071
Parent's no of children in house	-0.38	0.64

The above table shows that mathematics achievement of students is found to be strongly associated with parent's education, parent's time and parent's occupation. There is positive relationship between mathematics achievement parents education time and occupation. Also parent's number of children in house is negative relationship with the achievement of mathematics.

It indicates that there is significant relationship between mathematics achievement and parent's education, parent's time and parent's occupation but there is no significant relation between parent's number of children in house and mathematic achievement. Having analyzed overall the table mathematics achievement of students are found high relationship with parents education time and occupation but low relationship with number of child in house.

Inter Correlation between Mathematical Achievement and Parent's Involvement Related Variables.

Inter correlation between mathematical achievement with and parents involvement related variables (Parent's Education, Parent's Time, Parent's Occupation and Parent's no of Children in a house) are presented in the table below.

Table 7

Inter Correlation between Mathematic Achievement and Parents Related Variables

Variables	Parent's Education	Parent's Time	Parent's Occupation	Parent's no of children in a house
Mathematical Achievement	0.42	0.29	0.22	-0.38
Parent's Education		0.30	0.20	-0.09
Parent's Time			0.004	-0.058
Parent's Occupation				0.214
Number of children in a house				

The above table shows that mathematical achievement is positive correlated with parent's education, time provided by the parent's and parent's occupation that is negative correlation with parent's number of children in house. There is high correlation between mathematics achievement and parent's education. Now, the variable parent's education is positive correlation with occupation and time and negative correlation with the number of children in a house. The variable parent's time is positive correlation with parent's education and occupation and negative correlation with parent's no of children in a house. The variable parent's no of children in a house is positive correlation with parent's occupation and negative correlation with others variable. Having analyzed overall the above table the mathematical achievement of students are highly correlated with parent's education and achievement.

Regression Analysis between Dependent and Independent Variables

In mathematics this section the impact of parent's involvement related factors on achievement is analyzed 4 explanatory variables and one dependent variable were used in multiple linear regression model. The result of regression analysis and standardized regression co-efficient of explanatory variables are show in table.

Table 8

Regression and Standardized Co-efficient of Mathematics Achievement and Parents Involvement Variables

Independent Variables	Regression Co-efficient	Standardized co-efficient	Sig.	R value	R ²	Adj. R ²
	b	B				
Constant	24.836		0.00	0.321	0.103	0.258
Parent's Education	2.117	0.246	0.88			
Parent's Time	1.109	0.129	0.80			
Parent's	0.146	0.098	0.351			

Occupation						
Parent's no of children in a house	-0.244	-0.214	0.032			

a) Dependent Variable: Mathematics Achievement

b) Prediction Variable (Constant) Parents education, Parents time, Parents occupation and parents number of children in house.

According to alias (1997) multiple regressions are used to predict one variable on the basis of several other variables. It is also statistical approach to modeling the linear relationship between independent variables and dependent variable. Now Un standardized Co-efficient indicate how much the Dependent variable varies with an Independent variable when all other Independent variables are hold constant. Standardized co-efficient how many effects Independent variable with an Dependent variable. R value can be considered to be one measure of the quality of the prediction variable or level of predication. R^2 value can be considered to be proportion of variance in the dependent that can be explained by the independent variable. $Adj R^2$ to accurately report your data. The above table illustrates the information of the result analyzed. Based on the test result on the elevation it shows that parents involvement factors is the significant factors that contribute to the prediction model of the mathematics achievement. The above table shows an R –value (0.321) with an adjusted R^2 (0.258) which shows that only 25.8% effect was found in student's achievement by their parent's involvement factors. However, parent's involvement related factors contribute significantly to the prediction model of mathematics achievement, and 74.2% are other factors that might contribute to their achievement. From the finding the prediction model can be written as the following multiple linear equation.

$$Y = 24.83 + 0.246x_1 + 0.129x_2 + 0.098x_3 - 0.214x_4 + 5.187$$

Among the parent's education, parent's time, parent's occupation and parent's number of children in house variable the regression coefficient of parent's education is 0.246 which is the highest, so it is most influential factor to increase mathematics achievement of the students. Parent's education was found to be positively associated with mathematics achievement. Only 24% effect of parents education was found in their student's mathematics achievement. This concludes that the students of educated family were found to be more intellectual than others.

Similarly the regression coefficient of parent's time is 0.129 was found to be second positively associated with mathematics achievement of the students. Parent's time was found to be very strongly effect on mathematics achievement. Only 12.9% effect of parents provides time was found in their student's mathematics achievement.

Similarly the regression coefficient of parent's occupation is 0.09 was found to be positive associated with mathematics achievement of students. Only 9% effect of parents occupation was found in their students mathematics achievement. Parent's occupation was found to be low effect of the students on mathematics achievement.

And the regression coefficient of parent's number of children in house is -0.214 was found to be negative associated with mathematics achievement. Only -21% negatively effect of parent's number of children in house was found in student's mathematics achievement. so be negatively effect on mathematics achievement on their students.

There are parent's educations, parent's time and parent's occupation has positively influence on mathematics achievement of students. But the variable number of children in house was negatively influence on mathematics achievement on students. Overall having analyzed the above table the variables parent's education, parent's time and parent's occupation have more effect than the parent's number of children in house on the mathematics achievement of students

Chapter- V

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The first section of this chapter presents the summary of the research the second section present its findings the third section present to conclusion and the last section present recommendations based on the finding of the study.

Summary of the Study

This study was undertaken to identify the impact of parent involvement on their children mathematics achievement on secondary level. For this study, the searcher developed the achievement test paper with the help of prescribed curriculum and text of mathematics of grade ix and administrated the test in shree Saraswoti Tika higher secondary Bharatpokhari 3 Kaski for the item analysis of the test and for checking its reliability and validity to standardize it. The researcher also developed parent questionnaire form with the help supervisor. Achievement test and parent questionnaire form were main instrument used in the study.

For this research study the researcher select four public schools with 80 students from Kaski district. These data were obtained through the parent's questionnaires and student's achievement test. The mathematics achievement test data was obtained from student's achievement in mathematics exam. The parent's questionnaires form was developed to get detail information about parent's education, time, occupation and number of children in a house.

For the data analyses of the study, mean, standard deviation correlation co-efficient inter correlation and multiple regressions were used. The mean was used to find the level of mathematics achievement and standard deviation was used to find the variability of mean. Correlation co-efficient was used to determine the relationship between dependent and independent variables. Inter correlation are used to determine the correlated between dependent and independent variables and Multiple linear regressions were used to find the effect of independent variables on dependent variable i.e. mathematics achievement.

Findings of the Study

The collected data at the first were analyzed by applying statistical tools. Correlation and multiple regression statistical analysis the following results were found .

- The mean achievement score of educated parent's children is higher than the mean achievement score of literate parent's children and mean achievement score of literate parent's children is higher than those illiterate parent's children.
- The mean achievement score of Trade holder parent's children is higher than the mean score of job holder parent's children and the mean score of job holder parent's children is higher than the mean score of agricultural parent's children.
- The mean achievement score of three hour or more time hour provide parent's children higher than the mean achievement score of two hour time provide parent's children and mean achievement score of two hour time provide parent's children is higher than the mean score at one hour time provide parent's children.
- The mean achievement score of students from two children family is higher than the mean score of students of three or more children's family.
- There is significant effect of parent's education on mathematics achievement of students.
- There is significant effect of parent's time on mathematics achievement of students.
- There is significant effect of parent's occupation on mathematics achievement of students.
- There is no significant effect on students achievement by the number of children in house.
- The parent's education, parents provide time and parent's occupation are highly correlated with mathematics achievement.
- There is negative correlated between the mathematics achievement of children and number of children in house.

- There is positive relationship between the mathematics achievement of students and parent's education.
- There is positive relationship between the mathematics achievement of students and time provide by their parents at home.
- There is positive relationship between the mathematics achievement of students and parent's occupation.
- The parent's number of children in house is negative correlated with their children's achievement.

Conclusions of the Study

From the finding of the study the researcher made the conclusion that the parent's education is most contributing factor on their students than the other factor. So parent's education is strongly positive associated with mathematics achievement of students. It concludes that the parents education is very essential for increasing mathematics achievement of students. The children of time provide by the parents whose parents were devoted more time to their children's study was found to be higher than that at less time devoted parents children mathematics achievement. The children of parent's occupation trade and job family children better mathematics achievement than working farming occupation which conclude that regular income occupation support for better mathematics achievement. The children from the small family had better mathematics achievement than from large and medium. Which concludes that small family structure support for increasing mathematics achievement. The parents education, parents time and parents occupation were positively correlated with their children mathematics achievement but number of children at house is negatively correlated with their students achievement. Similarly from the regression analysis of the data we can conclude that the parents education is contributing factors on their students than the other factors.

It concluded that the above parent involvement factors are very essential for increasing the mathematics achievement. They are able to increase mathematics achievement by providing almost facilities for reading

and writing as well as parents guiding for doing homework by parents education and encouraging their children is better mathematics achievement.

Recommendations for Further Study.

After conducting this research the investigator found some findings, there are several are where the investigate would like suggest some recommendations and educations and educational implication for the implication for the improvement in mathematics achievement.

- The study of this kind should be conducted at all levels of schools and in other district as well.
- This study was limited to students of grade IX from four public schools, of kaski district, hence the investigator cannot generalize the finding of this study to all grade and the whole country. So the similar study can be done region wise as well as nation wise in the findings of the study.

Recommendations for Educational Implication

- This study could help the government policy maker, teacher parents and other related person.
- This study report may be very much helpful for the textbook writers, the educational planners and the curriculum designers.
- This is very much helpful to revise the curriculum and textbook.
- To identify the factors responsible for low mathematics achievement level national level study is needed and appropriate strategy from government level is recommended for improving the achievement level.

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Appendix A

Achievement Test Items

Class: Nine
Subject: Math
Student name:
School's name:

Full marks: 40
Pass Marks: 18
Time: 1 hr.

Attempt All Questions. Tick (✓) the best answer.

1. Which of the following is formula of simple interest?

A. $S.I = \frac{T \times 100}{P \times R}$ B. $S.I = \frac{I \times R}{100}$ C. $S.I = \frac{P \times T \times R}{100}$ D. $S.I = \frac{A \times R}{100}$

2. How much time it will take to earn interest Rs 1200 of Rs 4000 at 10%?

A. 5 years B. 7 years C. 2 years D. 3 years

3. If the cost of 15 pens is Rs. 420 ,then what will be the cost of 25 pens?

A. Rs. 520 B. Rs. 680 C. Rs. 700 D. Rs. 770

4. If we buy 12 meters cotton cloth at Rs 600 then how much cotton cloth will be buy at Rs 1500?

A. 30 m B. 35 m C. 20 m D. 18 m

5. There are 1200 students in a school, how many girls are there, if they are 24%.

A. 388 B. 288 C. 327 D. 305

6. The cost of a watch is Rs. 960 and we sell at Rs. 1200, what percent we gain or loss?

A. 15 % P B. 20 % L C. 10 % P D. 25 % P

7. Which one is the correct answer for profit percent given below?

A. $P\% = \frac{C.P - S.P}{S.P} \times 100$ B. $P\% = \frac{C.P - S.P}{C.P} \times 100$

$$C. P\% = \frac{S.P - C.P}{S.P} \times 100$$

$$D. P\% = \frac{S.P - C.P}{S.P} \times 100$$

8. The cost of a shoes is Rs. 275. The shopkeeper give 5% discount, what is real price?

- A. Rs. 270 B. Rs. 271.55 C. Rs. 261.25 D. RS. 250

9. The minimum cost of electricity up to 20 units is Rs. 40 and then increases by Rs 7.5/ unit, then how much cost will be for 40 units?

- A. Rs. 190 B. Rs. 130 C. Rs. 155 D. RS 205

10. In Kathmandu, if we take taxi its minimum cost is Rs. 7 and increases by Rs. 9/ km. If a person paid Rs. 115 then how much distance did he travel?

- A. 10 km B. 12 km C. 8 km D. 9 km

11. Which of the following is formula of parallelogram?

A. $A = \text{base} \times \text{height}$

B. $A = \frac{\text{base} \times \text{height}}{2}$

C. $A = \text{base} - \text{height}$

D. $A = \frac{\text{base} \times \text{height}}{2}$

12. A sphere has a radius of 14 cm. The volume of a sphere in m^3 is:

- A. 11498.6 m^3 B. 10498.66 m^3 C. 12498.66 m^3 D. 9 km

13. What will be the area of 4 walls of a rectangular room which has length (l), breadth (b) and height (h).

A. $A = 2h(l + b) + bh$

B. $A = 2h(l + b)$

C. $A = 2h(l + b) + 2bh$

D. $A = 2h (l \& b)$

14. The following factor of the form of a^3+b^3 which is true?

A. $(a-b) a^2 - 2ab + b^2$

B. $(a+b) a^2 + 2ab + b^2$

C. $(a-b)^2 + 2ab + b^2$

D. $(a-b)^2 + ab + b^2$

15. Then the LCM of $x^2 - xy$ and $xy - y^2$ is to equal.

A. $xy(x+y)$

B. $x(yx+y)$

C. $xy(x-y)$

D. $y(x+y)$

16. which of the expression below is equivalent to $9x^2 - 25y^2$ is factor

A. $(3x+5y)(3x-5y)$

B. $x(yx+y)$

C. $xy(x-y)$

D. $y(x+y)$

17. Which statement is true for LCM and HCF

A. $LCM = HCF \times \text{Common Factor}$

B. $HCF = LCM$

C. $LCM = HCF \times \text{Remaining all factors}$

D. All of above

18. If we subtract X from 4:9 then it becomes 5:9, What will be the value of X?

A. 19

B. 39

C. 26

D. 29

19. What will be the power of any number(except 0) to zero?

A. 0

B. 1

C. 2

D. 3

20. Which of the following number is $\sqrt{2}$?

A. Fraction

B. Negative

C. rational

D. irrational

21. Which of the following true will be the mathematics action

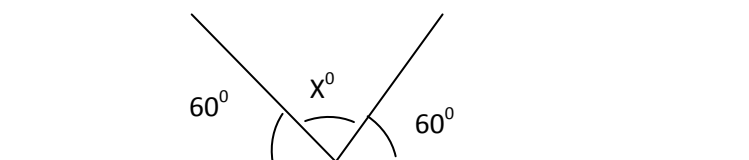
A. $9 \times 5 - 4 \times 5 < 9 \times 5$

B. $95 - 4 \times 5 < 4 \times 9$

C. $9 \times 5 - 4 \times 5 = 9 \times 5$

D. None of the above

22. In the given diagram what will be the value of x°

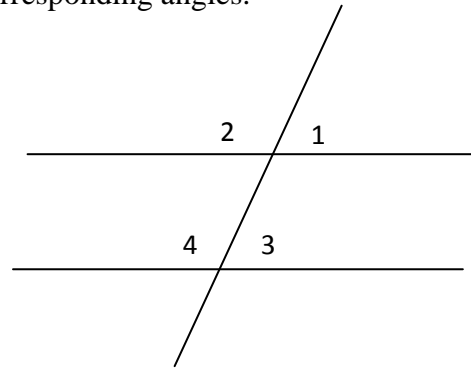


- A. 80° B. 60° C. 50° D. 30°

23. If a triangle having two angles equal then it will be?

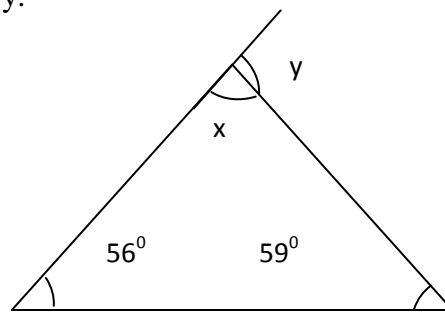
- A. Concurrency B. Differences C. Equal D. Similarities

24. Which of the following pairs of angles are corresponding angles.



- A. 1,3 B. 1,4 C. 1,4 D. 3,4

25. In the given figure find the value of x and y.



- A. $85^{\circ}, 150^{\circ}$ B. $75^{\circ}, 115^{\circ}$ C. $75^{\circ}, 105^{\circ}$ D. $65^{\circ}, 105^{\circ}$

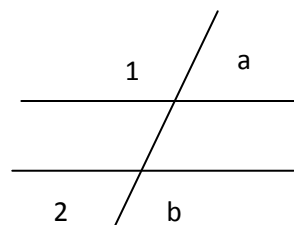
26. The quadrilateral having opposite angle equal is called.

- A. Trapezium B. Parallelograms C. Triangle D. Kite

27. Which of the sum of interior angles of hexagon?

- A. 720° B. 540° C. 100° D. 360°

28. In given figure $a \parallel b$ then what will be the relation of 1 and 2,



- A. Difference B. Equal C. Opposite D. Supplementary

29. Which of the angle of rectangle?

- A. Acute Angle B. Obtuse Angle C. Right Angle D. Both A and B

30. Which of the Name the theorem $h^2=p^2+b^2$ is called?

- A. Triangle theorem B. Pythagoras theorem C. None D. All

31. A geometry Axiom without proof is called ?

- A. Postulate B. Whole part C. Axiom D. Division

32. If $x=3, 5, 2, 2, 8, 6, 2$ then the value of mean is equal to

- A. 3 B. 5 C. 7 D. 4

33. In given data 10,13,12,10,5,3,8,7 then the value of median is data?

- A. 10 B. 9 C. 4 D. 6

34. Which is the formula to find mean? Where 'f' indicate frequency 'N' is sum of frequency and 'x' is variable

A. $\frac{\sum fx}{N}$

B. $\frac{\sum fx}{\sum f}$

C. $\frac{\sum fx}{\sum N+1}$

D. Both A and B

35. If $X= 2,5,7,8,9,10,12$ then the value of median is equal ?

- A. 15 B. 13 C. 8 D. 6

36. Find the mode from the given information

X	20	30	40	50	60	70	80
F	4	6	18	17	14	9	5

- E. 40 F. 50 G. 80 H. 70

37. What is the value of x if mode of given data is 5?

2	4	3	5	4	6	x	7	5
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- A. 3 B. 9 C. 7 D. 5

38. If we travel 80 km by 8 liters petrol then how much petrol will required to travel 30 km?

- A. 3 ltr B. 5 ltr C. 9 ltr D. 10 ltr

39. Which of the following formula true to surface area of cylinder.

- A. $A = 2\pi rh$ B. $A = \pi r^2$ C. $A = \pi r^2 h$ D. $A = 2\pi r (r+h)$

40. Which of the following conjugate is $\sqrt{8} + \sqrt{3}$?

- A. $\sqrt{8} - \sqrt{3}$ B. $\sqrt{8} \times \sqrt{3}$ C. $\sqrt{8} + \sqrt{3}$ D. $\sqrt{8} + 3$

Appendix B

Parent's Questionnaire

Parent's name:

Students name:

School name:

Namaskar,

Dear parents I am conducting a research on "Impact of Parents Involvement on their Children's Mathematics Achievement" in partial fulfillment for the requirement of Degree of Master of Education(MEd). I request you to fill up this questionnaire from your side' which can be great help for me to conduct the research in this topic. I would be grateful to you for the contribution of your valuable time and effort.

Q no.1) what is the status of your education?

- A. literate
- B. illiterate
- C. S.L.C or above

Q no.2) How much time you spend in your childrens education?

- A. 1 hour
- B. 2 hour
- C. more than 2 hours

Q no.3) Your monthly income.

- A. Rs 5000-rs 8000
- B. Rs 10000-rs 15000
- C. Rs above 15000

Q no.4) Number of your children.

A. only one

B. two

C. above 3

Q no.5) Family type.

A. nuclear family

B. joint family

Q no.6) Main occupation.

A. agriculture

B. business

C. job holder

Appendix C

Item Analysis Chart of Mathematics Achievement Test

QN	UR	LR	p-Value(%)	D-Value	Decision
1	9	10	95	-0.083	R
2	9	8	80	0.083	A
3	10	7	85	0.25	A
4	8	4	55	0.33	A
5	9	6	75	0.25	A
6	10	7	90	0.20	A
7	0	2	10	-0.16	R
8	10	7	85	0.15	R
9	8	6	80	0.33	A
10	8	7	70	0.16	R
11	7	1	35	0.50	A
12	6	4	60	0.16	M
13	5	2	35	0.50	A
14	2	1	35	0.083	A
15	9	6	70	0.25	A
16	7	4	50	0.25	A
17	4	2	35	0.16	A
18	5	3	40	0.16	M
19	1	1	10	0.00	R
20	2	3	25	0.083	A
21	5	2	35	0.25	A
22	4	1	30	0.25	A
23	10	4	70	0.50	A
24	7	4	50	0.25	A
25	3	1	25	0.33S	A
26	10	5	65	0.41	A
27	5	1	40	0.16	A
28	5	3	45	0.35	A
29	3	1	75	0.25	A
30	6	3	15	0.25	R
31	9	6	75	0.25	A
32	5	3	40	0.16	R
33	6	3	45	0.25	A
34	8	5	65	0.25	A
35	8	6	70	0.25	A
36	6	1	35	0.41	A
37	5	1	30	0.33	A
38	5	2	35	0.25	A
39	7	7	70	0.15	M

40	9	7	80	0.16	A
41	3	1	20	0.50	A
42	9	7	75	0.16	R
43	0	2	45	0.33	A
44	8	2	50	0.50	A
45	0	0	0	0.00	R
46	4	2	35	0.16	A
47	2	3	65	0.083	A
48	8	5	65	0.10	R
49	5	2	35	0.25	A
50	7	6	65	0.16	A

UR=number of students who give right answer with 27 %high score group.

LR=number of students who give right answer with 27%low score group.

P=difficulty level OR power of index

D=discriminations index.

A=accepted

R=rejected

M=modify

Appendix D

Split Half Reliability Calculation Table (Stanley's Procedure)

Students	Odd	Even	Sum	Difference
A	12	9	21 L	3
B	11	16	27	5
C	15	19	34 H	4
D	12	15	27	3
E	7	13	20	6 H
F	8	15	23 L	7 H
G	11	13	24	2 L
H	11	14	25	3
I	12	11	23 L	1 L
J	8	13	21 L	5
K	10	18	28	8 H
L	8	6	14 L	2 L
M	6	5	11 L	1 L
N	14	18	32 H	4
O	13	16	29 H	3
P	14	16	30 H	2 L
Q	13	21	34 H	8 H
R	13	20	33 H	7 H
S	15	14	29	1 L
T	8	17	25	9 H

Sum of the six highest score = 192

Sum of the six lowest score=113

Differences D.S = 79

Differences square (D.S)²= 6241

Differences of the six highest score =45

Differences of the six lowest score = 9

Differences D.d =36

Differences Square (D.d)²=1296

Using the formula of $r_{tt} = 1 - \frac{D^2d}{D^2s}$

$$= 1 - \frac{1296}{6241} = 0.792$$

Appendix E

Answer key of the Achievement Test Paper

Question number	Answer
1	C
2	D
3	C
4	A
5	B
6	D
7	B
8	C
9	A
10	B
11	A
12	A
13	B
14	B
15	C
16	A
17	C
18	D

Question number	Answer
19	B
20	D
21	A
22	B
23	D
24	A
25	C
26	A
27	B
28	D
29	C
30	B
31	A
32	C
33	B
34	D
35	C
36	A
37	D
38	A
39	D
40	A

Appendix F

Statistical Formula used in Analysis

$$1) \text{ Mean } (\bar{X}) = \frac{\sum X}{N}$$

$$2) \text{ Standard Deviation } (\sigma) = \sqrt{\frac{\sum d^2}{N} - \left(\frac{\sum d}{N}\right)^2}$$

$$3) \text{ Reliability co-efficient } (r_{tt}) = 1 - D^2d/D^2s$$

$$4) \text{ Correlation co-efficient } (r) = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$\text{Where, } x = X - \bar{X}$$

$$y = Y - \bar{Y}$$

$$5) \text{ Item difficulty level } (P) = \frac{R * 100\%}{T}$$

Where R=Right answer given students T=Total number of students

$$6) \text{ Discrimination Index } (D) = \frac{R_H - R_L}{\frac{1}{2} * T}$$

Where R_H = Number of student in upper group giving right answer

R_L = Number of student in lower group giving right answer

$$7) \text{ Multiple linear equation } Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + E$$

Appendix G

Row Score of The Sampled Students

According to Parent's Educations

Educated	Literate	Illiterate
38,40,39,33,40,40,33,40,34,35,37,20	34,30,25,33,24,25,35,29,31,31,26,30,31,33,29,32,31,28,24,28,31,16,42,20,23,21,19,38,22,20,33,29,23,38,22,17,33,29,23,35,35,29,25,17,18,18,17,19,21,27,20,15,17,18,20,19,16,20,20,19	24,22,15,22,28,30,30,25,20,30,19,20,20,16

According to Parent's Times

1 hour	2 hour	3 or more than hour
30,26,35,29,32,36,34,27,34,23	28,30,17,35,15,25,20,37,18,20,17,16,20,20	34,30,25,33,31,25,34,35,29,34,31,35,31,34,32,30,31,33,33,31,28,24,28,31,26,33,20,32,31,24,19,38,22,24,33,29,25,23,35,30,29,16,30,28,17,21,19,21,20,24,17,18,20,19,19

According to Parent's Occupation

Job	Trade	Agriculture
33,24,25,34,35,29,29,31,35,31,43,26,33,32,33,31,42,20,40,23,35,37,18,17,18,19,23,21,24,21,16	34,30,25,26,36,29,31,25,28	30,31,30,28,24,28,26,23,21,24,22,15,22,17,33,29,34,22,38,35,28,29,30,32,25,12,25,20,30,19,20,21,20,19,18,25,19,20,19,20

According to Parent's Number of Children in House

2 children	3 or more than children
33,28,35,20,23,21,24,19,16,15,34,17,33,25,20,35,30,18,21,22,22,24,18,20,19,16,20,19,20	34,30,25,33,24,25,32,35,29,31,29,31,30,33,26,26,35,26,30,31,34,29,32,26,31,28,24,31,26,26,23,34,23,35,22,34,35,28,29,30,40,25,22,25,17,18,24,23,24,21,26,27

Appendix H

Sample Schools Name

1. Saraswati Tika Higher Secondary School, *Bharatpokhari-04,Kaski*
2. Pardi Higher Secondary School, *Pardi Pokhara-17*
3. Chhorepatan Higher Secondary School, *Chhorepatan Pokhara -17*
4. Bhabishya Nirman Higher Secondary School, *Kristinachhanechaur -02, Kaski*
5. Janapriya Higher Secondary School, *Simalchaur Pokhara-17*