Determinant Factors of Low Achievement in Mathematics at Secondary Level

A

Thesis

BY

BirendraYadav

For the Partial Fulfillment of the Requirements for the Degree of Master in Education

Submitted

To

Department of Mathematics Education

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Tribhuvan University

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Letter of Certificate

This is to certify Mr. **BirendraYadav**, a student of the academic year **2018/2019** AD with thesis number **1644**, Exam Roll No. **7428253**, Campus Roll No. **227,** and T. U Regd. No. **9-2-306-56-2014** has completed his thesis under my supervision during the prescribed by the rules and regulations of T. U Nepal. The thesis entitled "**Determinant Factors of Low Achievement in Mathematics at Secondary Level"** embodies the result of his investigation conducted from **2020 to 2021** at the Department of Mathematics Education, University Campus, Tribhuvan University, Kirtipur, Kathmandu. I recommend and forward that his thesis is submitted for evaluation to award the Degree of Master of Education.

.....…….....

Prof. Dr. Bed Raj Acharya

(Head)

Date: 3 Dec. 2021

Letter of Approval

Submitted

By

BirendraYadav

Entitled

"**Determinant Factors of Low Achievement in Mathematics at Secondary level"**

has been approved in partial fulfillment of the requirements of the

Degree of Master of Education.

Viva-Voce Committee	**Signature**
Prof. Dr. Bed Raj Acharya (Chairman)	……
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Date: 21 Dec. 2021

Recommendation for Acceptance

This is to certify that Mr. **BirendraYadav** has completed his M. Ed. thesis entitled "**Determinant Factors of Low Achievement in Mathematics at Secondary level"** under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend and forward his thesis to the Department of Mathematics Education to organize the final viva-voce.

.....

Mr. Krishna Prashad Bhatt

(Supervisor)

Date: 21 Dec. 2021

Dedication

This thesis is dedicated to my father **Mr. ChaudhariAhir**,
my mother **Mrs. SursatiYadav,** My brother **Mr. Dharmendra Prasad Yadav.**
Whose love, support, and encouragement have enriched my soul and inspired me to
Purpose and completed this research.

Declaration

This thesis contains no material which has been accepted for the award of another degree in any institution. To the best of my knowledge and belief, thisdissertation contains no material previously published by any authors except due acknowledgment has been made.

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Date: 21 Dec. 2021 ----------

BirendraYadav

Abstract

This is the survey research related to find the determinant factors of low achievement in mathematics at secondary level. The main objective of this study was to identify determinant factors responsible for low achievement in mathematics at secondary level and to find the strategies by school mathematics teacher to improve achievement in mathematics. This survey was done at secondary level mathematics achievement in five schools of Rupandehi district. This study also focused on inside school factors and out of school factors which are responsible for low achievement in mathematics.

Stratified random selection of secondary schools with sample size 200 students and 5 secondary level mathematics teachers and 5 head teachers were selected to participate in this study. Two research instruments semi structured questionnaire for the students and interview schedule for the teachers and parents were the major tools for this study. To identify factors 200 items in questionnaire were used. The achievement score were obtained by schools sources then the score were judged and statistically analyzed in order to find out the determinant factors for low achievement in mathematics.

After collecting the data from survey the data were analyzed using average value which is directly and indirectly related to the school and out of school factors. Finding showed the students had various kinds of determinant in learning mathematics. In this research it was found that teaching learning process, time variable, family background and school environment were more responsible than other variable. The research finding brought some meaning implications to the teaching and learning of mathematics at secondary level.

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Chapter I
Introduction

This chapter begins with its introductory part, highlighting the background of study, statement of the problem, objectives of the study, significance of the study delimitation of the study and definition of the related terms.

Background of the Study

Mathematics is backbone of the community development. It is believed that the development of mathematics and development of civilization go together. Mathematics has lead the development of various subjects, vocations and technology nowadays mathematics is used throughout science, engineering, medicine and the social science. Mathematics not only practiced through the formal institution the contemporary societies have been practicing it with own ideas and believes. Applied mathematics is the branch of mathematics concerned with application of mathematical knowledge to other fields. Numerology is considered as application in that it held a mystical view of numbers. Mathematician are also engaged in mathematical examinations and mathematics for its own shake without having any applications in mind although practical applications for what began as pure mathematics are often discovered later.

Mathematics directly deals with human life. Mathematics is created to fulfill the human needs. Through mathematics was introduced later in the education system. It has been developed simultaneously with the development of society. Mathematics is not only through and practiced through the formal institution the contemporary societies have been practicing it with own ideas and belief system. Mathematics is dynamic in nature as discipline and an essential part of human life. It has been developed through the human endeavors in different eras has come to this height of development and will still be in the mathematics has been accepted as an important components of formal education from ancient period to the present day. History show that ancient people developed mathematics practically being obliged to solve day to day problem. Later on advanced form of mathematics structure, rules, formulas, theories have been developed and used on solving social problem through empirical observation and experiences. Now a day every human discipline interpreted in

mathematical models. Therefore, there is a definite need of mathematics to everybody daily life and also for the base of future studies.

People have a practical need to count certain things: cattle, cornstalks and soon. There is the need to deal with simple geometrical situations in providing shelter and dealing with land. Once some form of writing is added into the mire mathematics cannot be far behind. It might even be said that the symbolic approach precedes and leads to the invention writings. Mathematical documents from ancient Egypt date back to 1900 B.C. The practical need to redraw field boundaries after the annual flooding of the Nile. Early mathematics required a partial basis for its development and such a basic arose with the evaluation of more advanced form of society. It was along some great rivers of Africa and Asia that the new form of society made their appearance that Nile in Africa, the Tigris and Euphrates in western Asia, The Indus and the Ganges in south, central Asia and Huango Ho and then the Yangtze in eastern Asia. Thus early mathematics can be said to have originated in certain areas of agricultural and engineering pursuits (Best & Khan, 1999).

Mathematics is the central part of school curriculum not only in Nepal but in the entire world. Every society has observed mathematics as basic need of human civilization. It is not easy to say when and from where mathematics had started but one can see that mathematics as an essential part of human civilization. It was created to fulfill the daily needs of human life. Thus the nature and structure of mathematics was built with the development of human civilization ancient civilization such as Babylonian, Egyptian contributed for the development mathematics (Guragain, 2001).

Mathematics has longest history from integrity. It has been developing with the different civilization. It has played an important role in building up by perfecting all the sciences. It is one of the important subject in school education. It provides platform for the development of entire mathematics education as well as foundation for higher study of science and technology. In general mathematics learning helps people to understand and interpret the very important quantitative except of living and natural phenomena. In Nepal the present curriculum system has introduced mathematics as one of the core subject in school education. Historically, literature shows that mathematics originated from practical experiences. It was used in which building bricks, house, gutter, bridges, temples, pyramids, different handicrafts, and

planed cities. This is found from the evidence of Babylonia and Egypt civilization at around 3000 BC to 200 A.D. to you and to me for its method content as well as characterized by order and internal consistency. It is queen of all sciences. Elementary mathematics including ancient in most incidence civilization including ancient Greek, the Roman empire, Vedic society and ancient Egypt. In most cases, a formal education was only available to male children with a sufficiently high states wealth or caste (Poudel, 2017).

Mathematics developed from society. The history of mathematics education reflects that the contemporary society has served today's situation in the field of mathematics. It was developed to fulfill the necessities of the society. Mathematics is developed in different societies in their own means and ways for their requirements (Best and Khan, 1999). Basically it is very much older which begins in 11^{th} century as well-known as for the first mathematician of any note was a Greek named Zeno. Zeno of Elea is memorable for arguments like racecourse (Stephen and Sue, 2001).

The word "mathematics" itself derives from the ancient Greek word *mathematica*, meaning "subject of instruction", that means "to learn". Therefore, mathematics is the process of learning and it is an expression of human mind, concerned chiefly with idea, process and reasoning. Mathematics is the collection of experience of many previous thinkers. Therefore, it has a long history. Different thinkers and philosophers developed mathematics as a discipline for developing rules, formulae and system based on solving their social problems throughout the continuities of the civilization and social life. Mathematics is the necessity of the civilization. It has been originated with the raise of the human beings. Mathematics has been accepted as an important component of formal education from ancient period to till now. History shows us that ancient people developed mathematics practically being obliged to solve day to day problem. Later on advanced form of the mathematics structure, rules, formula, theories have been developed and used on solving social problems through empirical observation and experiences. Now a day, every human discipline is interpreted in mathematical model. Therefore, there is crucial role of mathematics to the every body's daily life and also for the base of further studies. Early mathematics required a practical basis for its development and such a basis arose with the evolution of more advanced form of society. It was along

some great rivers of Africa and Asia, that the new form of society made their appearance. Thus, early mathematics can be said to have originated in certain areas of agricultural and engineering pursuits (Yadav, 2001).

Nowadays, more of the students seeking admission in the previous fields of science and technology is increasing every year. Most of the educated parents in Nepal want their son and daughter study science and mathematics. They not only inspire but also compel their children to study these subjects. In effect most of time they get adverse result due to their children's interest, aptitude, attitude, ability and intelligence. They are even not capable to find whether their children have a favorable attitude for the study of the particular subject (mathematics) or not. As a result, there is a huge failure rate in mathematics subject. Therefore, it becomes essential before giving admission to student in any specified branch of the subjects to investigate the attitude and capability of the students. The factor, which affect achievement level of students of any grades in mathematics, are changeable in time and space. So achievement itself requires further analysis after the certain interval of time. In order to suggest measures for enhancing achievement level of secondary level students in mathematics first the factors affecting it needs to be identified. Relevant to this context, the present research was under taken to make a thorough assessment of achievement level of secondary level students and also identify the factors that determine the level of achievement among those students. In fact, such types of studies are necessary in order to make education better and fruitful (Joshi, 2017).

Mathematics and mathematics education are two separate disciplines in the field of education. Mathematics primarily focuses on the process and product of what mathematics does. The focus of mathematics is on creating mathematics with understanding its basic structure. It does not give much concern on how mathematics should be taught, what mathematics should be taught, who can learn mathematics and why one can't learn mathematics like issues. Mathematics education deals with mathematics from perspective of education. It is concerned with the development and implementation of appropriate mathematics curriculum and with all issues associated with the teaching and learning of mathematics. In keeping with concept of lifelong learning, mathematics education covers learners of all ages and at all levels from early childhood to adult. Thus, mathematics education is not solely concerned with

curricula, classrooms, teachers and learner in school, nevertheless, issues associated with school mathematics will major focus. The areas of mathematics education are curriculum, teaching, learning and evaluation. Five foundations philosophies, psychology, sociology, mathematics and technology guide these three areas. Hence mathematics education is applied discipline that deals with the wider application of mathematics in different sector and fields. Mathematics carrying full marks 100 along with optional mathematics 100 marks in both private and public school in secondary level (Ghimire, 1997).

Before the development of mathematics education there were no trained teachers, teacher used to teach through teacher's centered method without using teaching materials and there were no appropriate textbook but now days there are qualify, well trained mathematics teachers in public school and increase invest in per year in education area but according to result of SEE 2075 it gives low achievement in mathematics what is the main region to low achievement in mathematics at secondary level. What is the detrimental factors school related or out of school factors which effect achievement in mathematics. Mathematics education effect in private school better than public school because the achievement in mathematics is better than in public school. There may be different reasons behind it such as physical facilities, lack of textbook, lack of teaching materials, large size of class which are school related factor as well as parent's participation, home environment, parents education etc. Therefore, I will be motivated to explore the factors affecting learning mathematics in school level.

Statement of the Problem

I am a mathematics student. I have been studying mathematics continuously for last 18 years. I find that many people are saying mathematics is very hard subject only Special students learn mathematics. It has been depicted in various achievement researchers that student achievement in mathematics in Nepal is relatively low and unsatisfactory. According to result of SEE 2075 most students get low achievement in mathematics. According to NEB total 4, 60,109 students have been participated in SEE in Compulsory mathematics subject but 1, 71,541 (37.28%) students get grade E which has low achievement by comparison of others subjects it show that student get low achievement in mathematics(SEE Statistics,2075).

There is a deeper relation between achievement and learning variables. As mathematics is emphasized like language, most of students feel it as a difficult subject and some of students fail in mathematics in SEE examination. By this problem the great deal of time, money effort and manpower of the nation have been wasted. And it seems that it is affected by various factors like home and school environment, physical facilities, attitudes towards the subject, peer groups, teaching learning process, equipment etc. We cannot achieve the expected goal without improving appropriately the management of above mentioned factors to facilitate the students learning. Regarding this many students feel to learn the mathematics is very difficult task. That's why, the result of SEE in 2075 was not so good in public schools. The private schools have been some how successful in effective teaching learning activities and getting good result of their students in SLC examination with higher scores. Even though the result of SEE in 2075 was not good on public schools. It is due to the case of learning process. There may be some factors which affect the learning process of students. So I wanted to seek the factors affecting learning in mathematics. There was no investigation on factors affecting on learning in mathematics.

Objectives of the Study

The research objectives of this study were as follows;

1. To identify the determinant factors for low achievement in mathematics at secondary level.
2. To find the strategies taken by the school mathematics teachers to improve achievement in mathematics at secondary level.

Research Questions

The research questions of this study were as follows;

1. Does the school related factors affect the students achievement in mathematics?
2. Does the out of school related factors affect the students achievement in Mathematics?

Justification of the Study

When researcher studies a subject,It is very important for him/her to be aware of the benefits of the study for himself/herself. I am also a mathematics teacher of Malwar Devi Secondary School, Kanchan-3 Rupandehi. The findings of this research have helped me personally. I have been able to find out the determinant factors of low achievement in mathematics at secondary level. This research will be completely aimed to find those factors that are related to the achievement in mathematics. Not only to point out the factors, had it also suggested the ways to minimize the problem and what to be done this aspect. I have been able to find out reasons why students take mathematics as a difficult subject and how to increase the numbers of studying mathematics by minimizing student's misconceptions about mathematics subject. Now in the days to come, I will embrace mathematics as my profession, my career and take it as my source of income and spend my whole life in mathematics. In practice level, I hope that these findings helps for the teachers who are teaching mathematics and those teacher's who are beginner in teaching career they may take benefit from this research. And also, it provides for an increase in the number of students studying mathematics by eliminating the factors that affect student's learning mathematics. At the policy level, this study also helps the author who will write the textbook of mathematics about which types of problem to be included in the mathematics textbook. And also, it is beneficial for the curriculum planner about how the mathematical content is associated with the curriculum. It is helpful the government to adopt globally for the education level and the benefit of this study at the research level.

The findings would also form a data bank for reference and helps us an area of further educational research. One of the main challenges to mathematics teachers is to make a positive felling in students towards learning mathematics. Therefore, teachers should be aware of teaching/learning mathematics then they can improve student's interest in learning mathematics by reducing their negative beliefs. In short, the justifications of this study as follows:

- This research revealed the determinant factors affecting low achievement in mathematics which helps students to improve their achievements by minimizing the effect of these factors.
- This research suggested to the teachers and guardians to minimize the failure

rate of students by giving appropriate environment inside the school.

- This research helped to guide the teachers, curriculum planner, text book writer and policy maker to make the favorable curriculum, contents to the students.
- This study provides the parents to create a learning environment for their children.
- This study provides for NGO and INGOs that handed for the educational programmer.
- It is also helpful for data bank reference and further educational research.

Delimitation of the Study

According to Khanal (2019) delimitation is the process by which a researcher determines the scope of his study area and what kind of tools he wants to study based on the available resources and time.

The delimitation of the study was as follows:

- This study was limited to the five public secondary school appearing in S.E.E. examination 2075 B.S. from Rupandehi district.
- Only this five schools are selected were students get low achievement in S.E.E.
- It was limited to compulsory mathematics.
- Only 200 students from 5 sampled schools were selected in this study.
- The data of this study were generated through the questionnaire and semi structure interview.
- This study was limited only the responses of head teacher, mathematics teacher, parents and students.

Definition of the Related Term

Amount of Homework. It will help elementary students develop proper study skills which, in turn, influence grades. The national education association along with the national PTA suggests adding 10 minute of homework per night incrementally with each grade level, as a general rule of thumb.

Class size. Class size refers to the number of students in a given course or

classroom specifically either the number of students being taught by individual teachers in a course or classroom or the average number of students being taught by teachers in a school district, or education system.

Class size.class size means number of students in mathematics class.

Determinant factors. In this survey determinant factors means school related factors (physical facility, teacher's behavior, peer's behavior, teacher's qualification, interest of students and teaching methods) and out of school factors (social variable, family background and time variable) are considered

Home Environment. Home environment is the components which describes about the reading room, parents and other education related behaviors'. It is crucial component which is directly associated with learning of students.

Interest of Learner. Student interest in a topic holds so much power. Factoring for student interests works well with instructional planning based on readiness and learning profiles.

NEB. National Examination Board.

Peer Group.A peer group is both a social and a primary group of people who have similar interest, age, background or social status. The member of this group are likely to influences the person belief and behaviors.

Peer's behaviors. It is related to the behavior among student about mathematical problem and way of solutions. It helps to exchange their knowledge.

Physical facility. The facilities that provided by school like classroom size, playground, number of benches according to number of student teaching materials are considered.

Private School. The School that are established by a person or group of person where ever development of school depends on school´s income sources is called private school.

Public School. The school that are established by community or government of Nepal and overall budget for the development and maintenance is provided by

government is called public school.

School Environment. School environment means the internal and external surrounding of school from where the students learn something each day.

School's Policies for Learning Mathematics. School's policies play great role in the learning process. A critical study of all aspects such as administration, commodity, relations, students' performance, staff's relations etc.

SEE. Secondary Education Examination.

Teacher competency. Teacher competence refers to "the night way of conveying units of knowledge, application and skills to students." Competence is understood as excellent capability.

Textbook.A textbook is a manual of instruction in any branch of study. Textbook are produced according to the demands of educational institution school books are textbooks and other books used in school.

Time schedule. The scheduled time of any crew is the time, calculated at the beginning of the vent that they should arrive at any given control, which is fixed from the start of the event.

Chapter- II

Review of Related Literatures

This chapter begins with its empirical review, theoretical construction, theoretical understanding, and conceptual framework.

A literature review is the process of locating, obtaining, reading and evaluating the research literature in the area of the research. The main purpose of review of related literature is to develop some expertise in one's area to see what new contributions can be made and to receive some ideas for developing a research design.

Review of literature is an essential part of studies. It is a way to discover what other research in the area of one's problem has uncovered. A critical review of the literature helps the researcher to develop through understanding and insight into previous researcher works that relates to the present study. It is also a way to avoid investigating problems that have already been definitely answered. The present chapter attempts to review the research studies and literature in the domain of cause of failure in mathematics in SEE examination with special references. Also, the purpose of this chapter is to analyze the research literature relevant to the purpose and question addressed in this study.

There are some studies related to factor affecting in learning mathematics. The review of related literature helps to make the concept clear for the study and also directed to analyze and interpret the data sufficient literature related to this study in Nepalese context could not be found. Despite the fact, few related literature had been reviewed as follows. Research in any sector of skill wants a suitable studied with the works in which there many have many research been done in the same area. We get deep knowledge from research which must have already developed theories and researches which is approximately connected with the problem chosen by him or her. From review of literature we became identify of what has been established, known or studied and what has not been try to be found yet. It also provides knowledge find out the difference in research for further study. The purpose of review literature is to spread upon the text and background of the study. There are so many books, report and related studies will have been reviewed in order to explain the present problem of the study.

Empirical Review

Pant (1978) did an experimental research work on "Effectiveness of the use of unit test results in enhancing pupil achievement in mathematics" with the objectives to find out the effectiveness of unit test as a teaching tool for enhancing achievement in mathematics at the seventh grade level of a secondary school in Kathmandu Town Panchayat. He selected eight students from one school by systematic sampling and taught eight units from textbook. Unit test were given at the end of each unit in experimental group. A comprehensive test has given the multiple choices, completion items. He found that the achievement of two groups differed significantly.

Rahman (1981) did his thesis for Master's Degree on "Achievement in mathematics by sex: A study of sex differences in achievement in mathematics of seventh grade students in selected schools of Kathmandu Nagar Panchayat Area with the objectives to investigate whether sex influenced the achievement in mathematics. Achievement test (Knowledge, Skill, Comprehension and Application) in Arithmetic, Algebra, and Geometry was prepared and administered in five schools. The t-test was applied to conclude that the superiority of the boys over the girls with respect to achievement in mathematics as a school subject with regard to achievement in mathematics by area and also cognitive levels.

Ghimire (1997), studied on 'A study on factors affecting teaching/learning mathematics at secondary level' with the objectives to study the factors affecting in learning of school in terms of following: school environment, family background, motivational factors, physical facilities, interest of the learners, instructional materials. The tools for the study was administered to sample of ninety students and test was applied to conclude the following results:

- Environment of school in both rural and urban areas affect equally but the boys are more affected those girls. Students of Argakhanchi and Chitwan are affected than that of Kathmandu.
- Home environment affects more to the subject of rural areas and girls were affected more than boys.
- The students of Kathmandu were more motivated to study mathematics then that of Argakhanchi and Chitwan.
- The students of urban areas were more interested in the study of mathematics

and the girls paid more attention for this study.

- The students of the rural areas were more affected by the use of instructional material and girls paid more attention to the use of instructional materials.

Guragai (2001) did research on "A study of achievement in mathematics of primary level students of Morang and Dhankuta districts" with the objectives to compare the achievement in mathematics of primary level students between Morang and Dhankuta districts resembling Terai and Hilly region of Koshi Zone. Researcher developed an achievement test from the prescribed curriculum of grade V. Four hundred students from twenty jour schools were selected. Z-test was applied to conclude that Morang district surpassed Dhankuta district students in every aspect male, female, rural and urban.

Pant (2001) did a research work on "A study of achievement in mathematics at primary level in Doti district" with the aim to study the achievement level in mathematics of grade V students as a whole, by gender and location. Mathematics Achievement Test was prepared by the investor and administered on two hundred students, in six-government school. He concluded that the achievement level of fifth grade students in mathematics o Doti district was 44.16% and there were significant difference in the achievement among the rural schools' students and urban schools' students in mathematics.

Pokhrel (2001) had studied entitled, "Mathematics achievement in school leaving certificate examination between public and private school student at Kaski district." The main conclusion of this study was to mean achievement scores and correlation of private school student in compulsory and optional mathematics was greater than public school student in Kaski district in S.L.C. examination he concluded that the mathematics achievement of private school is better than public school. Richard (1983) had made study titled "Factors related to student's school achievement." He concluded the important factors related to students school achievement in mathematics are classroom behavior (time spend in learning, student attention, method of teaching Teachers background (trained, experience ability) of private & public school student's characteristics (prerequisite knowledge student attitude daily attendance)

Neupane (2001) did his experimental research on "A Study on the Effectiveness of Play Method in Mathematics Teaching at Primary Level." His study intended to answer the question whether the performance of the pupils of primary level taught by play-way method effects on the mathematics achievement as compared to traditional method. He collected the data through pretest and post-test in class one on addition and subtraction. Two equivalent groups were established on the basis of pretest results and randomization. Researcher taught in experimental and control group at the duration of one week and took post-test to both groups in some way. The data was analyzed and interpreted statically with t-test and discovered that experimental group achieved better performance than the control group. Hence his finding is that the achievement of students taught by play way method was significantly different than the achievement of the students taught by traditional method.

Poudel (2001) did a research work on "A study on the effectiveness of class work while teaching geometry at the secondary level" with aim to investigate if the class work turn to be effective while teaching geometry. The research conducted experimental studies. The researcher taught geometry to both the groups (experimental and control). The experimental group was taught the units class works entwined with the regular classroom whereas the control group was kept detached as far as possible classroom work activities. An achievement test was given. The t-test has used to conclude that experimental group did better than control group.

Yadav (2001) did a survey type research carried out on topic "A study on the effectiveness of the primary school teachers of the district of Sirha" with the objectives to explore the extent of effectiveness parameters in determining the effectiveness of primary school teachers and to compare the effectiveness of rural and urban primary school teachers. Twenty-eight teachers (twenty-two trained six semi-trained teachers) were as a sample. A questionnaire was prepared to solicit the opinions of the teachers. A classroom observation form was also developed to record the classroom situation and activities. U-test and z-test were applied to conduct that teachers were found to be effective. The effectiveness of urban teachers was not found to be significantly different from those of rural teachers.

Shrestha (2002), did research work depending upon the secondary data of the result of SLC examination on 'A study of mathematics achievement of private and regular student sin SLC examination. With the aims, to identity the trend in mathematics achievement of the schools attempting the SLC examination privately and regularly and to compare the overall mathematics achievement of private and regular students. Data were collected from Lalitpur district of the five years 2054 BS to 2058 BS. The t-test was applied to conclude that the trend in achievement of private and regular students in Lalitpur district in terms of mean. Scores were decreasing in both the cases in similar manner. The further concluded that mathematics achievement of the private and regularly students did not to different in the examination.

Tharu (2004) studies on 'Impact of socioeconomic status on mathematics achievement' with the objective to find the level of mathematics achievement of students with respect to their socioeconomic status and to determine the correlation between socioeconomic status and mathematics achievement and to determine the correlation between socioeconomic status and mathematics achievement by gender. The tools for the study were administered to the sample of 140 students of Bardiya district and mean, standard deviation, correlation co-efficient and multiple regression were used applied to conclude the following results :-

- The mean scores of educated father's children is higher than the mean score of literature, illiterate father's children and the mean score of literature father’s children is higher than those illiterate father's children.

- The mean score of job father's children is higher than the mean score of trade and agricultural occupation father's children.

- Mathematics achievement of students were found to be strongly associated with the father's education and father's occupation whereas family income variable had the low relationship that positively affected children's mathematics achievement.

- The variable family size and birth order of child were negatively correlated with mathematics achievement that adversely affective children's mathematics

achievement.

- The variable family size and birth order child had a mid-negative effect on mathematics achievement.

- Mathematics achievement status of boys and girls were found consistently positive associated with their variable father's education, father's occupation and family income that positively affected on boys and girls mathematics achievement and family size and birth order of child had negatively correlated that adversely affected boys and girls achievement in mathematics.

Sapkota (2005), studied on 'A Comparative Study of the Mathematics Achievement on SLC Result of Kathmandu and Kavre District of Nepal.' The major findings of the study in several variables are presented as follows: There is signs scant difference between the achievement in mathematics students of Kathmandu and Kavre district. There is significant difference between the achievement of boys and girls in mathematics of Kathmandu district. There is significant difference between the achievement of the students from rural and urban area of Kathmandu district.

Subedi (2005), studied on "Factors Affecting Failure in Mathematics in SLC examination". The major findings of the study are given below:

The variable school environment has strongly positive effect on the failure's mathematics achievement. The variables effective classroom teaching and time variable have a dispositive effect on the mathematics achievement. The physical interest of the learner has low positive effect on mathematics achievement.

Neupane (2006) conducted a research on "Effect of socioeconomic status on mathematics achievement". For this study researcher developed the achievement test paper, parent's questionnaire form and 84 sample students of grade III from V government schools of Lamjung district. From this research he concluded that the score obtained by students in mathematics was founded significantly correlated with parent's education, occupation, family size and structure of family size and structure of family were founded negatively correlated with mathematics achievement.

Bhattarai (2007) identity the factors that "Affect the use of instructional materials in teaching mathematics at primary level".And to study the existing condition of availability and use of instructional materials. It is also intended answer the questions.

- How many instructional materials are there in the primary schools?
- Are the available materials come into practice?

This study through the purposive sampling twenty public schools and twenty primary mathematics teachers were chosen from the Tanahu district. The example of the teachers was selected on the basis of one from each school. The data of sampled schools and teachers were obtained through the questionnaire and check for the purpose of analysis and data mean correlation co-efficient and regression analysis was used. After the analysis and interpretation of the obtained data the researcher found the following results:-

- The variables teacher training space available pre--students, availability of instructional materials and students teacher ration have strongly positive effect on the use of instructional materials.
- The variables teacher's attitude toward the use of instructional materials and teaching experience had negative effect on the use of instructional materials.

Nath (2007), did a study on a topic "A Study of Causes of Failure in Optional Mathematics in SLC Examination". The main findings of this study fir as follow, which are the causes of being failure. Text books are more theoretical. Lack of teaching materials in teaching activities.Teaching without familiar with students' previous knowledge.

Giri (2008) "A critical analysis of SLC Compulsory Mathematics scores 2063." Intending well educational out comes the state has finance large amount of money as well as guardian also have invented their children education, but result of SLC is still poor. Mathematics is being the major causes to make students failure. There is a saying that the course content, the way of managing circumstances, evaluation system all are within the favor advantages group, which always ignore the marginalize and deprived group. Almost all research finding have shown that there is not a unique determination, with affects students' achievement. Factors or variable

such as students' gender, as parents' education, occupation, location of school, students' religion, eco-status, teaching skill, environment, class size, medium of instruction are supposed to be the most influencing factors in mathematics achievement. This study was carried out with the view of finding among all variable state about which variable is most influencing.

Yadav (2008) did a survey type research work on "Causes of low a achievement mathematics" with the objectives are to analyze the mathematics achievement of Musahar students, to find the mathematics learning environment of Musahar students at school and home, to find the causes of low achievement of Musahar students at primary level.

Parajuli (2011) has studied entitled "Causes of failure in mathematics in S.L.C. examination in community school (A case study of Dhankuta district). In his study he found school related factors are peer group, class structure, school presentation, amount of homework and out of school related factors are parent's participation, curiosity of learner, time schedule, father's education affects the student's mathematics achievement by using one way Anova at the significance level = 0.5 with the objective what are the causes of failure in mathematics in S.L.C. exam, to what extent school related factors such as peer group, class structure, amount the homework affects the student's achievement. The tools for the study were administered to the sample of 100 students. The population of his study students' failure in mathematics in SLC examination of 2066 B.S. one way Anova was applied to conclude the following result:

- There was favorable opinion in parents in academic learning.
- There was significantly different in children in mathematics achievement on basis of parents involvement.
- There was significantly difference in children mathematics achievement of non involved parents.

CERID did a national work shop (12 - 16 January, 1987) and found the following factor play great role on achievement in raising the performance level in primary education such as teaching strategies parental support and school management. The student who completed secondary school can achieve differently in private and public S.L.C. examination but what is influencing factor in private and

public S.L.C. examination? What is the significance of influencing factor in mathematics examination? These are interesting question so researcher will wanted to be comparing the mathematics achievement of private and public school's student achievement.

Baral (2011) has studied entitled "Causes of failure mathematics in SLC examination (A case study of school in Bharatpur)." In his study he found school related factors are associated with school environment, physical facilities, teacher's behaviour, peer's behaviour, manageable library, classroom environment, regularity of teacher and student, instructional teaching materials etc. and out of school related factors are associated with family background, interest of learner towards mathematics, amount of time student spent on school activities such as leisure reading, homework, discussion with peers economic condition, motivation etc. affect mathematics achievement through qualitative as well as descriptive research. With the objective to explore the main cause of failure in mathematics in SLC examination and to suggest the main causes of bring improvement in result by finding the improvement programme that can be carried out in school level.The population of his study students' failure in mathematics in SLC examination of 2066 B.S. in public school of Saptari district. The tools for the study were administered to the sample of eighty students of eight school in which forty boys and forty girls from the population of the student failure in mathematics in SLC exam which concluded the following result:

- The student were found to be indifferent in study because the same teacher who taught more than two subjects (i.e. comp. mathematics, science, opt.maths)
- The mathematics teacher was unable to address for varied cognitive level's students in class room while teaching.
- The school was trying to reduce problem of mathematics failure by managing extra classes in the evening

TuncaySaritas and Akdemir (2009) study indicated the studies are affected by various factor. In their study they found school related factors are curriculum, instructional strategies and methods, teacher competency in math education, motivation or concentration method, participation instrument procedure analysis, self-directed learning, arithmetic ability and out of school related factors are associated

with gender, socio-economic status, parents educational level. They concluded purpose of the study as follows:

- How much to mathematics department students think demographic factors, including gender, parents' educational level and socio-economic status, influence their achievement in mathematics?
- How much do mathematics department students think instructional factors including curriculum, instructional strategies and methods, teacher competency in math education, and school context and facilities influence mathematics achievement?
- How much do mathematics department students think individual factors including self-directed learning, arithmetic ability, and motivation or concentration influence mathematics achievement?
- What are the three most influential factors on the mathematics achievement of students?

The finding of their study reported that instructional design of a mathematics course is important and should be compatible to the factors identified for mathematics achievement. Educators need to adapt and create alternative innovative learning and teaching strategies for effective mathematics education. The findings also suggest that different instructional design strategies should be studied and applied in different contexts.

Mishra (2017) has studied entitled "factors affecting achievement in mathematics at secondary level" with the objectives to identify the factors that affect of the achievement in mathematics and to analyze the strategies taken by school to promote mathematics achievement. This case study was qualitative in nature and conducted with the sample of one school from public school in Saptari district.

The finding of this study shows that following:

- That school has enough rooms, desks, bench and class size was big.
- Mathematics Teachers were having high academic qualification but the teaching style was poor and old.
- The single teacher taught different subjects and they were unable to prepare lesson plan.

- There was poor economic environment.

Poudel(2017) studied on 'detrimental factors for poor performance in mathematics' with the objectives to identify detrimental factors respectable for poor performance in mathematics and to find the strategies by school mathematics to improve achievement in mathematics. It was a survey type research in six school of Chitwan district. This study also focused on inside school factors and out of the schools factors which are responsible for poor performance. The tools for study were administered to the sample of 200 students of Chitwan district and mean, standard deviation were used to applied conclude In comparison of school related factors out of school related factors was more responsible for poor performance in mathematics.

Bhatta (2016) conducted experimental research on “Effectiveness of problem solving method in learning mathematics at secondary level” with the objective to compare the achievement of the students taught by problem-solving method and find the effectiveness of problem-solving method in teaching mathematics. The researcher was limited to his study on two schools in the kathmandu district. This study was an experimental type having two groups, experimental group and control group. The researcher, the experimental group was taught by the traditional method of teaching mathematics. The population of the study was included the ninth grade students of the government school of kathmandu. The researcher was selected 23 students of two schools, 12 as experimental groups from Shree Gram ShikshyaMandir Higher Secondary School and 11 as control groups from Baluddhar Higher Secondary School by using random sampling. For data collection, the researcher has selected an achievement test that also consisted of a subjective type of questions and the test score were descriptively analyzed by using different mathematical tools as mean percentage and t-test. She found that the problem-solving method was more effective than the usual traditional method.

Kafle (2016) carried out the research entitled “Teaching/Learning Strategies in Mathematics at School Level”. The main objective of this study was find out the role of headteacher in improving instructional strategies and to identify the teaching strategies of teachers in the mathematics classroom. This study was based on descriptive and explanatory research design. For this study, the researcher has selected an effective public school in the Arghakhanchi district. Also, the researcher

was collected data by using direct observation of school, face to face interviews with the head-teacher, teacher, parents and students. The researcher found that the mathematics teacher teaches mathematics using a lot of the discussion method, lecture method, sometimes using project work and also using the discovery method in the classroom during teaching/learning mathematics. Also, there were highly qualified and sufficient numbers of the teacher. Most of the teachers were trained and some of them experienced but untrained. And also, she found that immediate rewards after each good action of students were the best methods for motivation in the classroom.

Filling the Gap

Above literature mainly focused on the causes of failure and low rate of achievement. In the past decades it was practiced researching about the causes of failure of students in mathematics. To improve the learning not only finding causes of failure and low achievement but here needs to find affecting factors of learning mathematics. So I was interested to find the affecting factors of learning. Still the researcher is unable to address the factors affecting mathematics at secondary level. The previous researcher had addressed comparison of public schools and private school's marks result. By comparing that the researcher have shown better result of private school in the comparison of public schools. It was found that there is gap between causes of failure and low learning. Thus, to fulfill this gap, this research had been conducted.

All the researcher were done in different field. But there is no such researcher about Determinant factors affecting low achievement in mathematics at secondary level from different government school of Rupandehi district. This study tried to fulfill the gap in which there is lack of researcher in determinant factors affection low achievement in mathematics.

Theoretical Construction

In the section, the researcher will introduce the theoretical discussion which is relevant for the interpretation of the findings of the study. There are various learning theories related to children's learning and development. Some of them are classical conditioning, operant conditioning, trial and error, social learning, social development, constructivism, cognitive learning, socio-cultural, multiple intelligence

and so on.

From a contemporary constructivist perspective of mathematics education, personal experiences and previously learned knowledge and skills are encouraged as components for understanding. Observations, hypothesis and conclusions are made tested and drawn within a social environment that allows sense to be made. Unreasonable or meaningless mathematical solution would be medical by cultural knowledge, and skills acquired in class could be used in real contexts. Increased understanding should result from mathematical tasks being linked to personal student experiences, and form the incorporation of the linguistic and culturally of student's lives.

Basically, constructivism views that knowledge is not 'about' the world, but rather constitutive of the world. Knowledge is not fixed object, it is constructed by an individual through his/her own experience. This theory of learning acknowledges that individual is active agents, they engage in their own knowledge construction by integrating new information into a meaningful way. Constructivist argue that it is impractical for teachers to make all the current decisions and dump the information to students without cling students in the decision process and accessing student's abilities to construct knowledge.

The constructivist approach to mathematics learning is argued to lead understanding of mathematics when applied to the physical, social and cultural experiences and developmental contexts of the learner whereas traditional mathematics use of highly structured worksheets, step-wise rulers practice examples and formulaic solutions to word-problems has been criticized for its poor survival of understanding and application beyond the classroom. Conditions of classroom that foster a constructivist approach involve the use of realistic problems and conditions and the use of multiple perspectives, active engagement, group participation, frequent interaction and feedback, contexts that connect learning to real world and integration of assessment into instruction.

Social constructivism is focused much on learning through cooperative group learning. It emphasizes the importance of culture and context in understanding what occurs in society and constructing knowledge based on this understanding. Social

constructivism is based on specific assumptions about reality, knowledge and learning. To understand and apply models of instruction that are rooted in the perspectives of social constructionist, it is important to know the premises that underlie them. Social constructionist believes that reality is constructed through human activity. Member of society together invent the properties of the world. For the social constructivist, reality cannot be discovered that; it doesn't exist prior to its social invention.

Theoretical Understanding

There are many learning theories which can be used for the analysis and interpretation of data such as classical conditioning, operant conditioning and trial and error theory and so on.

Walberg Model (1981) has defined learning as a function personal variables and instructional treatment. Learning and performance of learned behaviors are influenced by several factors. Walberg describes a theory of educational productivity requiring optimization model, which mentions nine factors to influence achievement of cognitive and effective outcomes. This model includes a paradigm connecting aptitude (ability or prior achievement, motivation or self-concept and age), instruction (quantity of instruction and quality of the instruction) and environment (home environment, the classroom or school environment, the peer group environment and the mass media) as inputs to learning (effective, behavioral and cognitive).

Walberg (1981) proposed a theory of educational productivity which has theoretical foundation of Lewin (1963), formulation of behavior as a function of personality and environment. Walberg's theory requires optimization of nine factors to increase student's achievement of cognitive and affective outcomes.

The nine productive factors the students related variables

a) Ability or prior achievement
b) Age
c) Motivation of self-concept; the instructional variables
d) Quantity of instructions
e) Quality of instructional experiences; and educationally stimulated

psychological aspects

f) Home environment

g) Classroom or school environment

h) The peer group environment

i) The mass media (especially television)

These factors were classified into three general groups by Wilkins et al (2002):

a) Personal variables, such as prior achievement, age and motivation of self-concept

b) Instructional variables, such as amount or instruction

c) Environmental variables related to the home, teacher, classroom, peers and media exposure

Carroll Model (1982)

This model mentions that student's achievement depends on the degree of learning. It is a function of the ratio of tasks to the total amount of time assigned. In the learning model, Carroll describes student's achievement, which is affected by five factors.

a) Institute for particular kind of learning

According to carol, aptitude is the amount of time required by a learner to attainmastery of a given learning tasks.

b) Quality of instruction

This should be considered in terms its effect on individual learns rather than on groups of learners.

c) Ability to understand instructions

This is largely determined by verbal ability and reading comprehension.
To meet students need's instruction must be modified.

d) Perseverance

Students vary tremendously in the amount of perseverance, they bring to

aspecific learning task. Perseverance can be increased.

e) Time allowed for learning

This the key to mastery. Amount of time provided for traditional courses is too much for some and too little for others.

Bigg's Model (1985)

This model mentions that student achievement is influenced by student's personal and situational factors. It directly influences student's performance. Students learn by three types of processes-deep achieving and surface. It is also influences student's performance in a given subject. Student's ability and personality also affect achievement process. The personal factor are affected by ability, prior knowledge, personality and home background of a students. The situation factors also remain influential in student achievement. The course structure, instructional methods, time assigned to perform the task and task demand are the relevant situational factors. (Mishra, 2017)

Conceptual Framework

As discussed above related literature detrimental factors of achievement in mathematics may depend upon different variables. Generally achievement of mathematics are influence by school environment, social system, personal behavior, time variable and error in problem solving. Under the school environment physical facilities teachers qualification number of students in class and teachers behaviors we discussed. The variable home environment consists of parent's education, economical condition and parent's occupation. The variable related to school environment consists of physical facilities, teacher's behavior and peer behavior. Similarly teaching learning process consists of teacher's qualification and interest of students. Social variable consist of traditional effect and cultural custom. Time variable consists of time spent in learning and time spent in exercise and practice. The conceptual framework with related factors will be developed as follows:

Chart: Chart of Determinant factors of Low achievement in mathematics

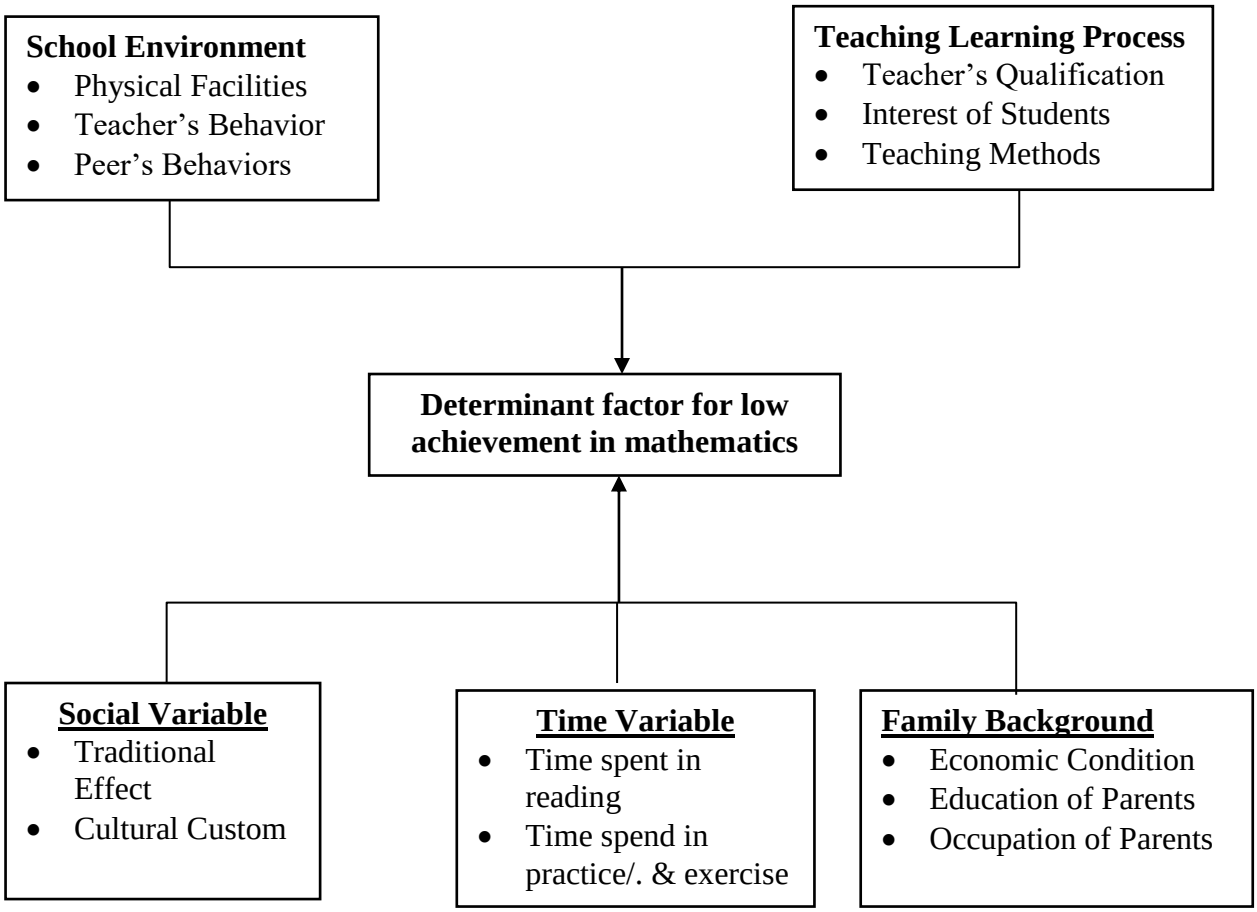

Figure 1

Source: Research on school related and out of school related factors (Fraser, 1994)

To make the more concept about the above chart researcher made tools. Questionnaires are the main tools of this study. To clearly the concept researcher prepared 10 questionnaires for the statement school environment is a factor for low achievement. Similarly 10 questionnaires for the teaching learning process, 4 questionnaires for social variable, 5 questionnaires for family background and 4 questionnaires for time variable. Later the score obtained from the students were analyzed using mean and explained each result.

Chapter III
Methods and Procedures

This chapter begins with its design of the study, population of the study, sample and sampling strategy, study area/field, data collection tools and techniques, data collection procedure and data analysis procedure.

Qualitative research takes an interpretative, naturalist approach to its subject matter, qualitative researchers study things in their natural setting, attempting to make, phenomena, in terms of meaning that people bring to them, Whereas the quantitative research is based on the qualitative measurements of some characters. It advocates use of quantitative methods. It seeks facts or causes of social phenomena without regard to the subjective sates of the individual. It has also obtrusive and controlled measurement and also its objective. So, Researcher chose qualitative methodology. But the researcher also used questionnaire and average value can be used for analysis and interpretation of results so qualitative method also used. The chapter was explained the plan and method of study which helped to achieve the objectives of the study.

Research Design

Research design is a plan and strategy of investigation concerned so as to obtain answer to the research questions. The research design is the detailed plan of the investigation. In fact, it is the blueprint of the investigation. In other words, it is the blueprint of the detailed procedures of analyzing the obtained data (Singh,2008, p.450).The learning in mathematics, which is directly or indirectly related to the school and out of school factors. Thus research design of the study was survey. To explore the determinant factors for low achievement mathematics at grade X, qualitative research design was adopted in general and the survey research design was followed in particular. Questionnaires for students were analyzed using average value, which is directly and indirectly related to the school and out of school factors. The study was designed to determine the factors of learning mathematics in public schools. Later, it is qualitative and quantitative both methods used to describe findings. Researcher used questionnaires and interview schedule. The design of research would case study with qualitative approach as well as in descriptive nature.

Study Area

The study depended on public schools Shree Malwar Devi Secondary School, Shree Barewa Secondary School, Shree Semari Community Secondary School, Shree Tinau Secondary School and Shree Vilrahawa Secondary School in Rupandehi for grade X students on academic year 2078.

Respondents of the Study

From total students and teachers of secondary level enrolled on affiliated school of Rupandehi district. I took any five secondary level school's mathematics teachers, students and percent.

Data Collection Tools and Techniques

The study was intended to find the determination factors behind the mathematics learning in governmental school in SEE graded students. For this, I used the following instrument to gather the data.

Questionnaire

At first the researcher developed the tools by himself and discussed with expert and thesis guide to make it more convenient. By receiving the feedback from experts, the tool was developed for the students. With the help of mathematics teachers and Head teachers of selected school the researcher collected the data from the students. After receiving the primary data it was tested and finalized. Questionnaires will be regarded as the main tools of this study which will be developed by researcher himself with the help of the supervisor. To clearly the concept researcher prepared 10 questionnaires for the statement school environment is a factor for low achievement. Similarly 10 questionnaires for the teaching learning process, 4 questionnaires for social variable, 5 questionnaires for family background and 4 questionnaires for time variable. Later the score obtained from the students were analyzed using mean and explained each result.

Observation Note

The class observation note was prepared to observe classroom management and physical environment, beginning of class, acquisition of learning used of

materials, closures of lesson and current evaluation of students during teaching learning activities.

Interview Schedule

The way of having face to face conversation in specific subject matter between more than one people is called interview. It was done to get the real and actual data from the research area. It was carried out by the researcher to prove his subject matter logically. It was more important because it will give real and accurate data for the research study. The interview was one of the major sources of data collection, and it was also one of the most difficult ones to get right. In qualitative research the interview was a form of discourse. According to Maskey (1975) its particular features reflect the distinctive structure and aims of interviewing, namely, that it is discourse shaped and organized by asking and answering questions. An interview was a joint product of what interviewees and interviewers talked about together and how they talked with each other. The record of an interview that we researchers made and then used in our work of analysis and interpretation was a representation of that talk. Two types of interviews were used in qualitative research in-depth interview and group interview.

In-depth interview were used basically in qualitative study design. With the same respondents several interviews were taken in different times. The term in- depth it suggests that one after another interview, new themes, perspectives or issues were explored and these newly generated themes/issues were followed in the next interview.So in-depth interview attempts to draw very inner meaning of phenomena from the perspective of the respondents.It was taken periodically in different settings, and different circumstances of the respondents but the settings all the time in natural. It was administered to know head-teachers, mathematics teacher, parents and students view about the factors affect learning mathematics.

Sample Procedure

First of all the list of secondary school prepared from the list were maintained by the district education office. There are According to the record of district education office, there was 264 secondary school in Rupandehi district. Among them 178 was public school and 86 was private school.On the basis of Development of Status of

Rupandehi. It was divided into rural and urban area. But I took five schools from public selected by stratified random sampling. Forty students were taken from each school. Five head-teachers and 5 mathematics teacher and twenty students according to convenience of researcher.

Scoring Procedure

For the analysis of items weight age of 5, 4, 3, 2, 1 is assigned to statements "Strongly Agree", "Agree", "Unknown", "Disagree", "Strongly Disagree" respectively. For the statements opposing to this point of view, the items scored in the opposite order, Mean score will be calculated. Total score of five point Likert's scale is 15, thus its average is 3. If the calculated index is greater than three, then it is concluded that the statement contains in strong favor to the statements. If the index measure is less than or equal to three it is weak favor to the statement.

Table 1: ***Likert's 5 Point Scale***

S.N	Meaning of Scale	Positive statements
1	Strongly Agree	5
2	Agree	4
3	Undecided/Unknown	3
4	Disagree	2
5	Strongly Disagree	1

If the statement is positive, they give their opinion strongly agree then score is 5, in the similar manner agree, undecided, disagree, strongly disagree have scored 4,3,2 and 1 respectively.

S.N	Meaning of Scale	Negative statements
1	Strongly Agree	1
2	Agree	2
3	Undecided/Unknown	3
4	Disagree	4
5	Strongly Disagree	5

If the statement is negative, they give their opinion strongly agree then score is 1, In the similar manner agree, undecided, disagree, strongly disagree have scored 2,

3, 4 and 5 respectively.

Data Analysis Procedure

Data obtained through the research instruments were analyzed using Average value to reduce the mistakes and it was easy to use reliable, valid, easily available, economic and popular enough. Descriptive statistics were used to determine the frequency percentage. For the statements there were five options they are SA for strongly agree and weights for this options was 5 marks. Similarly A for agree, U for unknown, D for disagree and SD for strongly disagree. The weights for these options were four, three, two and one respectively. Finally the researcher found the average value and describes the decision as favorable to the statement. In this analysis if the average value is less than 3 then the decision is defined as not favorable to the statements and if the average value more than 3 then the decision is favorable to the statements.

The data was collected from the different ways. The different data was collected from interviewing the students, record of school, as well as from the various people who was interested about this case. While analyzing the data head teachers, students, parents were involved. The researcher was collect important data and remarks of those people. The researcher was collect data through interview head teacher, teachers, students and parents.School records of students was helped researcher to collect data. The various themes were generated and used triangulation of field, literature and my experience interpretation and analysis of data.

Chapter IV
Analysis and Interpretation

The responses of the 200 student's form their questionnaire, face to face interview of 20 students', classroom observation of each 5 sampled schools and the responses of interview with 5 mathematics teachers were used to analyzed data.

This is a survey research sought to investigate the determinant factors of low achievement in mathematics at secondary level. Two research instruments were used in this study semi structure questionnaires and interview schedule.

The obtained data were analyzed and interpreted under the following headings:

- School environment related factors
- Teaching learning process related factors
- Social variable related factors
- Family background related factors
- Time variable related factors

School Environment Related Factors

There are many factors that directly or indirectly affect learning process. This study explored one factor that historically has received little attention by educational leaders. Researcher showed that planners should give serious consideration in designing learning environments outside of the traditional classroom, along with more attention should be given to exterior design of school building. The classroom lighting, color choices and windows play a significant role forming the learning environments. The teaching materials managed by school, library facility number of students in classroom, teachers behavior towards girls, peer behavior with their friends, collaboration, sharing of knowledge, question answer the teacher and students and roles, responsibilities and opportunities given by school and teachers to the girls are main determining factors for learning mathematics. The following ten statements define the positive influence of school environment in learning mathematics.

Table 2: ***Statements Related to School Environment***

S.N.	Statement	SA	A	U	D	SD	Average value	Decision
1	Teachers co-operativebehavior is helpful to study mathematics	53 (26.5)	38 (19)	41 (20.5)	40 (20)	28 (14)	3.240	Favourable
2	The teachers equally behave with weak and talent students	37 (18.5)	46 (23)	14 (7)	55 (27.5)	48 (24)	2.845	Non Favourable
3	The teacher equally behaves girls and boys	46 (23)	50 (25)	20 (10)	39 (19.5)	45 (24.5)	3.065	F
4	The teachers helps students afterthe class also	56 (28)	42 (21)	32 (16)	30 (15)	40 (20)	3.22	F
5	Teacherindividually cares the Students	16 (8)	42 (21)	30 (15)	68 (34)	44 (22)	2.69	NF
6	There is a provision of unit test after completion of each unit	34 (17)	40 (20)	20 (10)	59 (29.5)	47 (23.5)	2.775	NF
7	Learning environment is better inclassroom because peer's cooperative behavior	38 (19)	36 (13)	16 (8)	68 (34)	42 (21)	2.800	NF
8	There is sufficient faulty number of physical facility	72 (36)	59 (29.5)	24 (12)	27 (13.5)	18 (9)	3.700	F

9	Size of classroom, numbers of benches are sufficient for students	45 (22.5)	34 (17)	22 (11)	68 (34)	31 (15.5)	2.97	NF
10	Students get opportunity to read additional book of mathematics because of availability of library	22 (11)	34 (17)	52 (26)	50 (25)	42 (21)	2.72	NF

(Parenthesis in the above table indicate the percentage of students)

The teacher's cooperative behavior is helpful to study mathematics has average 3.240 so it is favorable to the statements. It shows teachers cooperative behavior motivates the students to learn. If a teacher does not cooperate the students then there is less interest to the matter which effect mathematics learning. Similarly the statements to the teachers equally behave with weak and talent student which course below average students to be dissatisfied and effects mathematics learning. The statements 3, the teacher equally behave girls and boys be favorable and it has the average value 3.065 it is the positive expect to large mathematics. Similarly teachers helps students after the class a schools the average value 3.22 which is favorable to the statements and the statements 5 that's teachers individually cares the students as the average value 2.69 which is not favorable cannot pay proportional time for each students, mostly students be careless. Similarly the statement 6, there is a provision of unit test after completion of each unit the average value 2.775 which is not favorable to the statement and performance would be decrease which average value 2.800 and not favorable to the statement. The students from different locality are there in school. The peer's negative behaviors make the students to feel humility which affect to learn mathematics.

The statement 8,9 and 10 are related to school administration. The statement there is sufficient no of physical facility has average value 3.7 which is favorable to statements. Similarly statements 9 the sizes of classroom, no of benches are sufficient

are students having average value 2.97 which is not favorable to the statements. It shows that uncomfortable sitting also affects the mathematics the learning so it is also one of the determinant factor in mathematics. Hence the most of the students are disagree with the statements students get opportunity to read additional books of mathematics in school library. This statement has averages value 2.72 and not favorable to the statements. It means if students don't get change to go library for additions knowledge they cannot show their performance well which affect the achievements of students.

Interviews were taken with school mathematics teachers related to the statement class size and numbers of benches are not sufficient for the students?

Mathematics teacher-"*Anyway students are adjusted but according to the number of student size of class room and number of benches are not sufficient. While writing students feel uneasy and for the teacher also it's being difficult to care individually*".

Do students get opportunity to study in library? According to him "*we have small library, books may not be enough and we have not divide special time for library study but some of the students go to library during Tiffin time and leisure period.*"

Most of the teachers view was that not only the school environment but the interest of the student also determines the result of mathematics. Some of the students are very curious to learn mathematics and they except more time and ideas from mathematics teacher but we have no leisure period and not well manage the different level of students we cannot give special treatment and guide to them. After the response the researcher went toward the head teacher and asked "Do you agree that motivation of administration affect the mathematics learning". According to head teacher "*a highly motivated person puts in the maximum effort in his or her job. Today the relationship between teacher and pupils if often up down; pupils come because they must and teachers teach because they are paid to teachers mourn that their profession is not respected and complain that they are inadequately paid for the duties they are required to do they look over their shoulders at other professions and condition of services for a better life".*

Hence from the above discussion it can be concluded that the school environment is not better to acquire high result is also the cause of low participation in leaning mathematics.

Teaching Learning Process Related Factors

Theoretically, it was assumed that student achievement in mathematics is influenced by the teaching learning process. Teacher's qualification, interest of learners, expectation views and beliefs towards mathematics are explained under the teaching learning process. Teacher's qualifications as determined by education and experiences. Expertise and license holder has been shown to be the single most significant factor contributing to student achievement. If student do not have curiously to learn, the teacher cannot teach the expectation of teachers, parents and students themselves have a significant effect on achievement levels. Different recharges show that students who are expected to learn are more likely to achieve in school. It has been shows that teachers generally tend to have lower expectation for minority children from poor family. Students attitude and believes also affect the mathematics learning. Many articles suggest that students have negative attitudes and expectation for their performance in mathematics. Teachers teaching styles such as their use of co-operative rather than comprehensive learning techniques also play a vital role of students in mathematics achievement. A highly motivated person puts the maximum efforts in his/her job. According to Farrant (1968), today the relationship between teacher and pupils is often upside down. This ascertain by Farrant(1968)exhibited lack of motivation on the part of both teacher and students. More so, it may contribute to ineffectiveness and inefficiency in academic work and its effect. The following ten statements define the teaching learning process that can be influence in learning mathematics.

Table 3: ***Statements Related to Teaching Learning Process***

S.N	Statements	S.A.	A	U	D	S.D.	Average Value	Decision
1	Teachers are qualified enough to teach mathematics	54 (27)	30 (15)	68 (34)	25 (12.5)	23 (11.5)	3.335	F

2	Teachers motivates for new ideas	17 (8.5)	45 (22.5)	39 (19.5)	71 (35.5)	28 (14)	2.76	NF
3	Teachers discuss about previous lesson before starting new lesson	32 (16)	58 (29)	49 (24.5)	37 (18.5)	24 (12)	3.185	F
4	It is easy to learn mathematics if teacher use teaching materials	75 (37.5)	55 (27.5)	23 (11.5)	36 (18)	11 (5.5)	3.735	F
5	Teacher give opportunity for discussion dividing students into small group	20 (10)	48 (24)	43 (21.5)	58 (29)	31 (15.5)	2.840	NF
6	The teacher teaches mathematics through much drilling	78 (39)	28 (14)	16 (8)	43 (21.5)	35 (17.5)	3.350	F
7	Teachers use different teaching methods to teach mathematics	13 (6.5)	42 (21.5)	32 (16)	48 (24)	65 (32.5)	2.450	NF
8	Students like to learn mathematics with peers group	76 (38)	37 (18.5)	31 (15.5)	22 (11)	34 (17)	3.495	F
9	Students practice	25	55	62	38	20	3.135	F

	already though exercise again	(12.5)	(27.5)	(31)	(19)	(10)		
10	Students thinks mathematics is a difficult subject	73 (36.5)	25 (12.5)	36 (18)	46 (23)	19 (9.5)	3.42	F

(Parenthesis in the above table indicate the percentage of students)

Table shows that 7 statements among 10 statements are favorable. The statements Teachers are qualified enough to teach mathematics is favorable; It has the favorable value 3.335. The quality of education depends on teacher's qualification. If the teacher fails to keep himself in touch with the rapid scientific and educational development then he/she would become inefficient and ineffective. It is the quality of teacher on which the population of class mainly depends for excellence. Teachers are different with respect to their attitude and in what they expect from students. The statements teacher motivates for new idea has the average value 2.76 it is not favorable for the statements. If a teacher experiences the classroom as a safe, healthy, happy place with supportive resources and facilities for teaching learning, Improving the motivation and status of teacher generally improves teaching. The students learn more in classroom with highly dedicated and motivated teachers. So it is also one of the detriment factors for poor performance in mathematics.

Similarly most of the students are agree with the statement It is easy to learn mathematics if teacher use teaching materials. The average value of this statement is 3.735 which favorable to the statements. Use of different teaching materials in mathematics plays the essential role to make the clear concepts. The statement that teacher give opportunity for discussion dividing students into small group is not favorable. It has the average value 2.840 which means the students do not get chance to learn by sharing their ideas from the peer group. Similarly the statement the teacher teaches mathematics through much drilling has the average value 3.350 which is also favorable to the statement. For this we can say the teacher use much drilling rather than use of sufficient teaching materials the statement 8, 9 and 10 are related with the interest of the students. The response of almost student's shows that they do not have much interest in learning mathematics and according to student's interview mathematics is very difficult subject because there is no practical number and so

many abstract formulas only. Many things when teacher was taught we easily learn but after few days we forget all. .

For the statement use of teaching materials, the reached took an interview with mathematics teacher. According to him "*we use different teaching method and teaching materials not only this lecture method sometimes we divide them into small group and let them to make them to discuss for better understanding. We are ready to use teaching materials if administration provides us but we cannot force them*. After the response the teacher and the researcher went to the Head teacher and asked do you agree that motivation of administration affect the mathematics learning? According to head teacher "*A highly motivated person puts in the maximum effort in his or her job. Today the relationship between teachers and pupils if often in his or her job. Today the relationship between teacher and pupils if often up down; pupils come because they must and teachers teach because they are paid to teacher mourn that their profession is not respected and complain that they are inadequately paid for duties they are required to do they look over their shoulders at other professions and condition of services for a better life."*

Effective learning in the classroom depends on the teacher's ability to maintain the interest that brought students to the course in the first place (Erickson, 1978). Teachers must recognize the diversity and complexity in the classroom such as ethnicity, gender, culture, language abilities etc. Classroom diversity exists not only among students and their peers but maybe also be exacerbated by language and cultural differences (Barberos, 2018). The teacher must recognize individual differences among his/her students and adjust instructions that best suit the learners. In the interview time, I had asked a question about mathematics teacher's teaching strategies and his teaching methods According to students "*The learning style of all students in classroom may not be the same. In such a case, the teacher has to solve the same problem in different ways. But the teacher always teaches us using the same technique so that we have no motivated for learning mathematics at classroom.*

"The teacher always teaches us by following the traditional technique and only exam-oriented in classroom. Which makes me bored feel during mathematics class.

In classroom observation time, I saw that teacher had never smiled at the

classroom, never told any jokes. The teacher had used only problem-solving methods in teaching and ended the class that day. After wrote the statement and formula on the whiteboard the researcher solved the problem by using the formula deductively and students were copied this. During the interview time, researcher asked the questions for some students “How is your opinion about the teaching strategies used by teacher in your classroom?” In this question, most of students were replied that “our teacher never used any new materials rather than textbook, marker and whiteboard. He usually taught us by lecture method and teacher center method”. Thus, from the above responses of students, it can be claimed that the students were not active in learning in the classroom that may be because of the teacher’s teaching strategies and they can’t express their expression, feeling, a problem which directly linked with student’s difficulties in learning mathematics. Therefore, from the above evidence, it can be concluded that the teachers should teach traditionally without using appropriate techniques in the classroom is another cause of student’s difficulties in learning mathematics. I can say that to make mathematics teaching effective, teachers need to adopt the appropriate technique in the classroom. No matter how goog the curriculum and subject matter, if the teacher does not teach in the appropriate technique/strategies for teaching mathematics.

The statements concluded that the teachers qualification, interest of learner, use of teaching materials. Expectations etc are the influencing factors in learning mathematics of students. For additional information, the interviews were taken from the mathematics teacher and head teacher to derive qualitative information regarding the influence of teaching learning process in learning mathematics. The question was “Do the performance of the students depend on teaching learning process inside the classroom?” most of the teacher side that performance of the students highly affected by the teaching learning process inside the classroom that not only the fact. Performance of the students depends on their interest. We use expository approach of teaching mathematics which limits students classroom activities to just listening to teacher’s words and copies from the boards are the major methods of instruction by most one question about the interest of students like mathematics than other subjects or they feel difficult?” The head teachers views in this query was most of the teacher had positive attitude towards mathematics. They believe that mathematics is difficult by nature so the students study mathematics just to pass the S.E. E. exam According

to the information achieved from the teachers it can be said that the main influencing factor on learning mathematics are interest of learners, teacher's activities in classroom and method of teaching lack of using teaching materials. The mathematics teachers said that" *The students are very careful about mathematics before grading system but after applying grading system students thinking was changed because if students are get grade E in mathematics then he/she also able to study in higher education by choosing other subject. Our government can also ignore mathematics because according to government social subject is more powerful then mathematics.*

Hence from the result obtained from the responses of teachers and head teachers through interview it is concluded that the teaching learning process is main infusing factors in learning mathematics.

Social Variable Related Factors

Social economic status: Social economic status is most commonly determined by combining parent's educational level, occupational status and income (Jeynes.2002). In most of the studies done on academic performance of students, it is not surprising that social economic status of one of the major factors studies while predicting academic performance. According to Graetz(1995).Ones educational success depends very strongly on the social economic status of the parents. Considene and Zappala (2020) argue that families where the parents are advantaged socially. Educationally and economically foster a highly level of achievement in their children.

The different social variable such as social system, cultural customs, and traditional effects of gender biases are the main factors that hinder learning mathematics. In earlier days and in present day also boys are exposed to the society but girls are restricted. On the other hand, the conception of the people also has vital influences on learning of mathematics. The following four statements define the social and culture factors which affects on learning mathematics.

Table 4: ***Statements Related to Social Variable***

S.N.	Statements	S.A.	A	U	D	S.D.	Average value	Decision
1	Social	71	56	42	18	13	3.77	F

	environment affect to the mathematics learning	(35.5)	(28)	(21)	(9)	(6.5)		
2	Our tradition affects while learning mathematics	36 (18)	23 (26)	59 (29.5)	52 (14)	30 (12.5)	2.915	NF
3	Mathematics learning depends on cultural backgrounds	52 (26)	45 (22.5)	63 (31.5)	15 (7.5)	25 (12.5)	3.42	F
4	Society encourage the students to learn mathematics	43 (21.5)	47 (23.5)	37 (18.5)	28 (14)	45 (22.5)	3.075	F

(Parenthesis in the above table indicate the percentage of students)

The above table shows that only one statement among for statements is not favorable. It has the average value 2.915 statement one, three and four are favorable. The average value for statements social environment affects to the mathematics learning is 3.77 it means the decision is favorable for the statement. For more convenient result the researcher took an interview with parents that "Do you think that the surrounding environments affect the students to study?" In the response of question be answered "*Of course surrounding environments affect the children learning. If all the children always play and do not care about study then the friends who are studious are slowly involved playing rather than study"*. The average value of statement two is 2.915 so the decision is not favorable for the statement . "Our traditional affect while learning mathematics? the researcher again took an interview with head teacher for some statements" Head teacher-"*Our tradition partially affect the students but we can't claim that tradition is only factor for affecting students learning. The pupils from different culture and tradition are here. Some students have got very good environment at home but could not improve as inspection but some students are doing better although not getting enough time are environment to study.*

Some parents are sending government school to the daughter and private school to son". The society has equally literate and illiterate people. But most of the people don't encourage and admire the girls to learn mathematics. Thus, the social variable which includes social system, cultural customs and traditional effect of gender directly influence on learning mathematics of students.

Besides quantitative testing, qualitative information was collected from students and their parents regarding the social variable that affect the roles. Responsibility and opportunities is given by society to the students in learning. Researcher asked a question to the mathematics teacher that "Do you believe that social variable affect the student's mathematics learning?" mathematics teacher responded on social factor contributing to poor performance in mathematics cited circumcision, beliefs, early marriage and family income. Also cultural constraints insecure environment caused by socio-cultural problems at school. They lack concentration in class and confidence in whatever task they are given to do.

Family Background Related Factors

Home is consideration as a foundation of education. Theoretically, it is assumed that the achievement in mathematics is highly influenced by the home environment. Parent's education, socio-economic conditions of family, study hour at home, practice time of mathematics and gender bias in family generally considered as the home environment. The achievement of child depends not on the part played by teachers but also on the parent's awareness, interest and knowledge about handling and guiding their children's at home. The economy status of the parents directly affects the child learning. Various researches show that higher the socio-economic status of family greater the child achievement. The role, responsibilities, constraints, opportunities, practice time given by family to daughter in home played the vital role in learning mathematics. The following five statements given in table-4 are related to the home environment that supports in course of learning of mathematics.

Table 5: ***Statements Related to Family Background***

S.N.	Statements	S.A.	A	U	D	S.D.	Average Value	Decision
1	The economic	31	82	25	52	10	3.36	F

	condition of parents is sound	(15.5)	(41)	(12.5)	(26)	(5)		
2	The educational status of parents is important to learnmathematics at home as well	25 (12.5)	55 (27.5)	35 (17.5)	62 (31)	23 (11.5)	2.985	NF
3	The occupation of parents has direct effect on student's progress in mathematics	21 (10.5)	56 (28)	43 (21.5)	32 (16)	48 (24)	2.85	NF
4	Concepts and views of parents towards mathematics have direct effect on their children to learn mathematics	22 (11)	56 (28)	23 (11.5)	65 (32.5)	34 (17)	2.835	NF
5	Guardians discuss with teachers about student's progress	29 (14.5)	73 (36.5)	45 (22.5)	18 (9)	35 (17.5)	3.215	F

(Parenthesis in the above table indicate the percentage of students)

From the table it showed that the statement one and five are favorable to the statements its average value is 3.36 and 3.215 respectively socio economic status is determined to be a predictor of mathematics achievements. This study discovered that parent's annual level of income is correlated with student's math achievement scores. The study showed that parents with higher socio-economic status are more involved in their children's education then the parents if lower socio-economic status. From the table it showed that the statement one and five is favorable to the statements, it's average value is 3.36 and 3.215 respectively.

Beside the qualitative data, the researcher had conducted interview of the students, parents and teachers to collect qualitative information about the influence of home environment in learning mathematics. In course of interview period The researcher asked questions to the students as "Do you get sufficient time and environment to practice mathematics?" the student's views were "*I have to go to the work after coming from school, sometimes for cutting grass, sometimes in field and sometimes cow, buffalo and goat grazing. Sometimes in kitchen and I have to do any work after returning from school*." Most of their views were not supportive for learning mathematics. Similarly, the parents concern about education for student's education and visiting with math teacher. Teachers responded that "*we have such type of students whose parents are under economic status, low or no education background. From these types of parents how we expect supportive learning environment in the home, they neither consult with us about their children education nor take the progress report. They only visit school at the time of admission and some are in parent's day".*

Hence from the above analysis, it can be concluded that parent's education, parents behaviors, study time at home are influencing factors in learning mathematics. Due to the less priority given by parents to their students in learning mathematics is main cause of achievement in mathematics.

Time Variable Related Factors

Certain kinds of time on task are positively related to student's achievement. It is reasonable to expect that instructional approaches which foster that kind of time. On task would be successful in promoting achievement increases. Mastery learning with its emphasis on specific objective, careful teaching to those objective and provision of additional time allotments to those students who initially fail to reach a pre determined criterion on formative tests has frequently been found superior to no mastery approaches in fostering achievements gains. After acquiring the mathematical concept or knowledge, the most important thing is to make it long lasting. To make it permanent drill, review and maintenance are the main factors. Appropriate drills not only develop the knowledge and skills in students but also develop the habit of practice. Similarly review of mathematical concept is one of the most important factors in learning process. The main purpose of review is to organize and retain

learning. It provides new motion to the students. At least, the most important factor to permanent the learning is maintenance. It prevents the students to forget the mathematical concept, skills and relations. The following four statements given in the table below are related to time variable that could create positive environment for students in learning mathematics.

Table 6: ***Statements Related to Time Variable***

S.N.	Statements	S.A.	A	U	D	S.D.	Average Value	Decision
1	Students spend much time on learning and practicing mathematics in class	22 (11)	52 (26)	15 (7.5)	68 (34)	43 (21.5)	2.710	NF
2	The course of mathematics is completed on time	45 (22.5)	75 (37.5)	22 (11)	48 (24)	10 (5)	3.485	F
3	Sufficient time to solve and practice mathematical problems is provided	15 (7.5)	38 (19)	29 (14.5)	68 (34)	50 (25)	2.500	NF
4	Sufficient time is provided to read and think onmathematical obstacles	18 (9)	25 (12.5)	45 (22.5)	63 (31.5)	49 (24.5)	2.500	NF

(Parenthesis in the above table indicate the percentage of students)

Above table shown the decision of statement two, the course of mathematics is completed in specific time is only favorable for the statements. It shows that the completion of course in time is not a major problem in Rupandehi district. But the decision of other statements are not favorable they have the average value below three. It shows that time management for study mathematics is one of major problem or detriment factor for low achievement in mathematics. From these it can be

concluded that most of the students do not give much time in studying. Reviewing the problems of mathematics due to this reason the achievement of mathematics of students has become low. At last it is concluded that time variables is also an influencing factor that affects in learning mathematics. Time variable in reading and practicing is very important for achievement in mathematics learning.

In course of interview period The researcher asked questions to the students as "Do you get sufficient time to read and practice mathematics?" the student's views were " *Wedon't have proper time to read and practice because we give time to all subjects equally. So that we are weak in those subject. Mathematics is not our interesting subject."* Parents responded that "*They are lazy. They don't give time to their study. We are from poor economical background. So we can't free all time. They also support our corn field."*

In addition to surveying the factors that affect the learning mathematics, the researcher had taken interview with teachers and students for information. The teacher's views regarding this time variable were also similar with the result obtained from the qualitative techniques. Most of the teachers focused on drill, practice and maintenance or review of studied lessons done by students are the main factors for betterment in mathematics. They also added that the students do not give more time to study mathematics, which are the main causes of low achievement in mathematics.

Chapter V
Finding, Conclusion and Implication

This chapter includes that a summary of the whole study. It also includes findings and conclusion derived from the analysis and interpretation of the previous chapter and finally recommends how these findings can be used in the academic field. This chapter concerns in the following heading or sections:

- Findings of the study
- Conclusion of the study
- Implications of the study
- Recommendation for the further researcher

Especially this research survey is under the survey of low achievement in mathematics. It had tried to seek the determinant factors of low achievement in mathematics and its measure. As the purpose of the study is to identify the determinant factors for low achievement. Here researcher has got many points on it. Not only to identify the causative factor of low achievement it was concerning on its remedial measure too. Students use mathematical concepts and logical reasoning to solve their daily problems. So the higher achievement in mathematics is expected by parents and individuals involved in education. Thus it is necessary to conduct research study on factors affecting student achievement in mathematics. A range of sources shows that high rate of failure in school mathematics is a problem not only in Nepal but also in other countries around the globe. Poor performance in mathematics is creating difficulties in teaching learning activities at school. Providing individual right to education and managing classroom with different cognitive levels to bring out common educational outcomes is a matter of problems to the school administrator. They are also challenges for the curriculum designers.

To fulfill the objective of the study the researcher selected five schools in which are all public school. 200 students were selected by stratified random sampling from grade ten. The selected school's mathematics teachers and Head teacher are the sample of the study. The data of the study were collected from students, teachers by questionnaire and interview schedule. For the analysis and interpretation of the result, descriptive analysis technique (frequency, percentage and Average value) was

adopted.

Findings of the Study

The findings of the studies are followings:

- For the low achievement of the students in mathematics, school related factors and out of school related factors both are responsible.
- In the comparisons of school related factors out of school related factors is more responsible for low achievement in mathematics.
- Teaching methods, teacher's qualification, size of class room, peer group's behavior, teacher's behaviors towards students affect the achievement of the students.
- Motivation in mathematics also affects the student's performance in mathematics.
- Parental love, education of parents and society also affect the student's performance in mathematics.
- From the analysis of the data, it is found that continuous practice, review and application of mathematical concept affect on learning mathematics.
- The students who were encouraged by the society to study mathematics did better in mathematics were as those who were discouraged did not do well in mathematics. Thus it can be concluded that the social variable such as social system, cultural customs, traditional effects of gender directly influence in learning mathematics of the students.
- The learner's interest had strong positive effect on achievement of mathematics result.
- Effective classroom teaching had strong positive effect on mathematics learning.
- Physical facilities had not satisfactory effective on achievement of mathematics.
- Financial condition was not strong enough to send their children at schools and couldn't afford them in their further education. Most of the parents were illiterate and their children were usually used as means of earning money for their simple livelihood.

- Parents influence their children to complete their house leaving the school. Some of the parents did not encourage their children to go school.
- The environment of the school was poor. There was no suitable environment for the students. The rooms were dark and too hot.
- Teachers did not give homework for the students. If given, they did not check regularly. Students were not encouraged to do homework regularly.

The researcher would like to list out the way to find the strategies taken by the school mathematics teachers to improve achievement in mathematics by conducted in semi structure interview and classroom observation with five mathematics teachers and twenty mathematics students. From these strategies and overall dissertation, I have carried out the strategies taken by school mathematics teachers to improve achievement in mathematics at secondary level as follows:

- To teach the mathematical problems by connection with student's daily life.
- Share positive attitudes about mathematics.
- Encourage questioning and make space for curiosity.
- Provide authentic problems that increase students' drive to engage with mathematics.
- To teach the mathematical problems in a practical way rather than the theoretical way.
- Use digital technology in the mathematics classroom.
- Mathematics teachers need to use students-centered method in the classroom.
- Use cooperative learning method in the mathematics classroom.
- To provide scholarship for those students whose family economic condition is really weak.
- Provide an opportunity for students in learning mathematics at home and school.
- To create the student-student and student-teacher interaction environment in the mathematics classroom.
- To motivate the students for learning mathematics in the classroom.
- To conduct the national/school level awareness program about mathematics subject.

- To make mathematics learning effective, teachers need to teach mathematical problems in connection with students' daily life and also teachers need to use appropriate teaching methods and materials for effective mathematics teaching/learning in the classroom.

Conclusion

The mathematics achievements of students are correlated with school environment. In terms of correlation of school environment, effective classroom teaching, physical facilities and family background have also positive impact upon the student's achievement because they were positively correlated with each other.

Teacher's beliefs about the nature and purposes of mathematics and how students learn have a powerful effect on the practice of teaching. Although the school seems to have sufficient physical infrastructure and qualified teachers but the teachers seem to be unable to maintain individual differences and promote slow learners in teaching learning activities of mathematics. Classroom practice, time variables, family background and school environment were the main cause of low achievement of students in mathematics at secondary level.

I have also concluded that teachers need to use cooperative learning method in the mathematics classroom rather than the theoretical way to motivate the students for learning mathematics in the classroom to use digital technology in the mathematics classroom, to create the student-student and student-teacher interaction environment in the classroom, to teach the mathematical problems in connection with students' daily life for improving the interest of students in learning mathematics. On other hands, it is also necessary to conduct the national/school level awareness program about mathematics subject to decrease the misconception of students about mathematics subject, to provide scholarship for those students whose family economic condition is really weak and also mathematics teachers need to teach on student centered method in classroom then we can improve the achievements of students in mathematics at secondary level.

Implications

Every research has implications in different sectors (Shrestha, 2002). The survey entitled "Determinant Factors of low Achievement in mathematics at secondary level" has also implications in different sectors. Major focuses this study to find out determinant factors responsible for low achievement in mathematics at secondary level and to find the strategies by school mathematics teacher to improve achievement in mathematics. The major implication of this study concerns with educational and policy fields. Therefore, the main implication of this study can be listed as follows;

Educational implications

- It helps to identify the determinant factors of low achievement in mathematics at school level.
- It helps students to improve their achievement by minimizing the effect of these factors.
- It is helpful for the teachers to select effective teaching strategies to motivate the students in learning mathematics.
- It is useful for those teachers who are beginner in teaching career they may take benefit from this research.
- It helps to improve the interest of students in learning mathematics by eliminating the factors that affect students' mathematics learning.
- It helps to promote the cooperative learning method and student-centered method in mathematics classrooms at school.
- It helpful for mathematics teachers, head teachers, parents, students, researchers, curriculum planner, textbook writers, educationists and myself also.

Policy implications

- It is helpful for author who will write the textbook of mathematics about which type of problems to include in the mathematics textbook.
- It useful for government to adopt globally for the education level.
- It is beneficial for the curriculum planner about which type of area in the

curriculum.

- It is useful for form a data bank reference and helps us an area for further educational researcher.

Recommendation for further Researcher

After conducting this study, the researcher got some important findings as mentioned above. On the basis of those findings, the researcher would like to provide some recommendations for the improvement in mathematics achievement and get rid of the threatening problem of failure and low achievement in mathematics.

- The study of this kind should be conducted at all levels of school and in others subjects as well
- This study was limited to the students of grade ten from five secondary schools. Hence the researcher cannot generalize the findings of this study to all grades and to the whole country. So, similar studies should be done region-wise as well as in order to establish the findings of the study.
- Promoting research and development efforts for increasing mathematics achievement.

There should be effort on the rising of people's awareness and commitment. In rural area, parental attitude towards education is below the threshold level because their immediate concern is with daily subsistence. Thus in such a situation, necessary real for sending children to school may be lacking. The teacher should be equipped with skills and abilities to deal with the subject matters and students. A proper teacher training program focusing on the learning outcomes in mathematics should be implemented. Parents should be made aware to enhance the education of their children.

In order to enable students to attain the learning outcomes, the school management should continuously identify the learning problem faced by the students and take remedial measure to address them.

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Appendixes

Appendix-A

Questionnaire

Student's Name: .....…..... Address: .....

Name of School: .....

Direction: please check (√) and rate yourself honestly based on what you actually do given the statement using the following scales:

S.A.-Strongly agree A.- Agree U- Unknown

D-Disagree S.D.- strongly disagree

Statement Related to school environment:

S.N.	Statements	S.A.	A.	U.	D.	S.D.
1	Teachers co-operative behavior is helpful to study mathematics					
2	The teachers equally behave with weak and talent students					
3	The teacher equally behaves girls and boys.					
4	The teachers helps students after the class also					
5	Teacher individually cares the students					
6	There is a provision of unit test after completion of each unit					
7	Learning environment is better in classroom because peer's cooperative behavior					
8	There is sufficient faulty number of physical facility					
9	Size of classroom, numbers of benches are sufficient for students					
10	Students get opportunity to read additional book of mathematics because of availability of library					

Statement related to teaching learning process:

S.N.	Statements	S.A.	A.	U.	D.	S.D.
1	Teachers are qualified enough to teach mathematics					
2	Teachers motivates for new ideas					
3	Teacher discuss about previous lesson before starting new lesson					
4	It is easy to learn mathematics if teacher use teaching materials					
5	Teacher give opportunity for discussion dividing students into small group					
6	The teacher teaches mathematics through much drilling					
7	Teachers use different teaching methods to teach mathematics					
8	Students like to learn mathematics with peers group					
9	Students practice already thought exercise again					
10	Students thinks mathematics is a difficult subject					

Statements related to Social Variable:

S.N.	Statement	S.A.	A.	U.	D.	S.D.
1	Social environment affects to the mathematics Learning					
2	Our tradition affects while learning mathematics					
3	Mathematics learning depends on cultural Backgrounds					
4	Society encourage the students to learn mathematics					

Statements related to Family Background:

S.N.	Statement	S.A.	A.	U.	D.	S.D.
1	The economic condition of parents is sound.					
2	The educational status of parents is important to learn mathematics at home as well					
3	The occupation of parents has direct effect on					

	student's progress in mathematics					
4	Concept and views of parents towards mathematics have direct effect on their children to learn mathematics					
5	Guardians discuss with teachers about student's progress					

Statements related to Time variable:

S.N.	Statement	S.A.	A.	U.	D.	S.D.
1	Students spend much time on learning and practicing mathematics in class.					
2	The course of mathematics is completed on time					
3	Sufficient time to solve and practice mathematical problems is provided					
4	Sufficient time is provided to read and think on mathematical obstacles.					

Appendix-B

Guidelines for interview with students

Name of students: ……..... Class: ……

Name and Address of School: ……

Parent's Education: …… Parent's Occupation: ……

Major Area of Interview

- Study hours at home
- Study hours for mathematics at home
- Support of Parent's
- Learning environment at home
- Interested area of study
- Views about mathematics
- Views about mathematics teacher and his teaching methods
- Peer group relations and participation in learning
- Homework and class work progress
- Further planning
- Gender bias at home, society and school

Appendix-C

Guidelines of interview with secondary Math teacher

Name of teacher: …… Ethnicity: ……

Sex: …… Age: …….

Qualification: ……..... Religion: ……

Trained/ Untrained: ……... Teaching Experience: …

Address: ……

Major Areas of Interview

- Teaching strategies of mathematics
- Home environment and influence in learning mathematics
- School environment
- Social variables
- Behavior towards students

Appendix-D

Guidelines for Interviewing Head teacher

Name of teacher: …… …

Qualification: ……....

Teaching Experience: ……

Major Areas of Interview

- School environment
- Teaching strategies of mathematics
- Social variables
- Behavior towards students
- School facilities
- Classroom management
- Relation with parents/guardians
- Home environment and influence in learning mathematics

Appendix-E

Interview Guidelines for Parents

Name of Parents: …… Sex: ……

Education Status: ……. Occupation: ……

Income (Monthly): ……

Interview Areas:

- Views about education for children
- Needs of mathematics in our daily lives
- Gender equity and equality at home
- Support to their children in their study in terms of economic and academic.

Appendix-F

List of Schools

S.N.	Name of Schools	No. of Students	No. of Maths Teachers
1	Shree Malwar Devi Secondary School, Kanchan-3 Jhargaira, Rupamdehi	55	1
2	Shree Barewa Secondary School, Mayadevi-3 Kamhariya, Rupandehi	47	1
3	Shree Semari Secondary School, Mayadevi-6 Semari, Rupandehi	40	1
4	Shree Bhilrahawa Secondary School, Mayadevi-2 Bhilrahawa, Rupandehi	30	1
5	Shree Tinau Secondary School, Mayadevi-6 Betheri, Rupandehi	28	1
	Total	200	5

Appendix-G

Sample Teachers Profile

S.N.	Name of Teachers	Address	Age	Experience	Training/ Qualification
1	PadamParsadAcharya	Kanchan-3, Rupandehi	43	25 years	Trained/ M.Ed.
2	Ram BilashNagbanshi	Mayadevi-3,Kapilvastu	45	20 years	Trained/ M.Ed.
3	Binod Kumar Chaudhary	Siyari-3, Rupandehi	41	22 years	Trained/ M.Ed.
4	Anand Kumar Tripathi	Siddharth-8, Rupandehi	36	5 years	Untrained/ B.Sc.
5	RajendraChaudhary	Gaidahawa-1,Rupandehi	31	4 years	Untrained/ M.Sc.

Appendix-H

Details of SEE Result of Regular Students by Subjects 2075 (2019 AD)

DETAILS OF SEE RESULT OF REGULAR STUDENTS BY SUBJECTS 2075 (2019 AD)

Low achivement

S. No	SUB CODE	SUBNAME	Credit Hour	A+	A	B+	B	C+	C	D+	D	E	Abs	Total
1	101	COMP. ENGLISH	4	15787	57117	60765	49721	67396	95346	83513	23491	557	6379	460072
2	106	COMP. NEPALI	4	3221	39188	83421	97922	106356	80931	36331	6324	110	6312	460116
3	109	COMP. MATHMATICS	4	10996	22263	29257	33361	36353	44262	52819	52901	171541	6356	460109
4	111	COMP. SCIENCE	4	19599	39381	50671	53087	72939	91127	85292	39915	1394	6490	459895
5	123	COMP. SOCIAL STUDIES	4	3111	27047	67920	81120	99963	89777	55800	18760	505	6422	450425
6	133	COMP. HEALTH, POP & ENV EDU	4	21051	70007	89650	89172	82115	56155	26234	8613	259	6409	449665
7	134	COMP. SANSKRIT LANGUAGE	4	4	21	36	27	43	67	141	116	57	16	528
8	135	COMP. FALIT JYOTISH	4	0	0	0	1	2	3	6	1	0	2	15
9	231	OPT.I ADDITIONAL MATHEMATICS	4	11175	15634	17818	19780	19263	18494	16163	12133	24743	1051	156254
10	240	OPT.I HISTORY	4	0	1	5	24	154	538	587	239	115	57	1720
11	241	OPT.I GEOGRAPHY	4	12	212	1050	2023	2380	1698	723	137	4	200	8439
12	243	OPT.I ECONOMICS	4	211	2798	9689	20823	33361	47879	51920	35859	34741	4390	241671
13	247	OPT.I ENVIRONMENT SCIENCE	4	716	2558	3503	2625	2156	1498	811	280	3	125	14275
14	261	OPT.I JUSTICE (NYAYA)	4	0	0	0	4	7	4	3	0	0	1	19
15	262	OPT.I GRAMMAR (BYAKARAN)	4	8	4	8	11	26	66	38	22	31	8	222
16	263	OPT.I ASTRONOMY (JYOTISH)	4	7	10	2	0	6	6	2	13	15	0	61
17	264	OPT.I LITERATURE (SAHITYA)	4	0	7	10	18	37	50	38	25	25	4	214
18	265	OPT.I VED (SUKLA YAJURVED)	4	5	2	3	2	1	2	0	0	0	10	25
19	266	OPT.I ETHICS (NITISHASTRA)	4	0	3	6	5	1	1	0	0	0	0	16
20	269	OPT.I BHOT LANGUAGE	4	0	1	1	2	1	2	0	0	0	0	7
21	301	OPT.II OFFICE MGMT & ACCOUNT	4	26694	39639	31413	26526	23214	17483	9206	2598	103	1852	178728
22	302	OPT.II AGRICULTURE	4	12	101	412	554	619	478	245	77	1	69	2568
23	305	OPT.II RITES (KARMA KANDA)	4	4	10	22	16	9	4	0	0	0	0	65
24	306	OPT.II EDUCATION	4	295	6736	23395	32752	29274	18842	8949	2984	113	2712	126052
25	311	OPT.II AYURVED	4	0	3	18	41	15	4	0	0	0	5	86
26	312	OPT.II SCIENCE	4	145	186	132	36	16	2	0	0	0	0	517
27	331	OPT.II ADDITIONAL MATHEMATICS	4	5	5	6	10	2	8	7	4	6	3	56
28	334	OPT.II COMPUTER SCIENCE	4	30243	21337	14085	9539	5163	1018	30	0	0	367	81782
29	385	OPT.II HEALTH & PHYSICAL EDUCATION	4	778	4233	9342	13974	14569	9804	4379	1561	51	1449	60140
30	389	OPT.II BUDDHIST EDUCATION	4	4	1	1	1	0	0	0	0	0	0	7
31	502	COMP. GRAMMAR & TRANSLATION	4	35	32	36	31	28	41	17	4	1	7	232
32	506	ELEC. ENGLISH	4	0	0	3	5	1	1	0	0	0	0	10
33	512	COMP. SANSKRIT LANGUAGE & LITE.	4	1	14	8	10	8	2	1	5	1	3	53
34	535	COMP. RITES (KARMA KANDA)	4	51	48	53	37	20	4	0	0	0	2	215
35	604	OPT.I URDU	4	0	0	1	3	7	7	0	5	2	0	25

DETAILS OF SEE RESULT OF REGULAR STUDENTS BY SUBJECTS 2075 (2019 AD)

S. No	SUB CODE	SUBNAME	Credit Hour	A+	A	B+	B	C+	C	D+	D	E	Abs	Total
36	605	OPT.I TIBETAN	4	0	10	20	35	25	12	0	0	0	0	102
37	606	OPT.I MAITHILI	4	1	15	36	45	77	98	98	86	51	27	534
38	607	OPT.I NEWARI	4	0	0	5	7	4	0	0	0	0	0	16
39	610	OPT.I ENGLISH	4	5	35	106	149	145	99	72	11	35	4	661
40	642	OPT.I CIVICS	4	0	0	3	3	9	2	0	0	0	0	17
41	645	OPT.I SOCIOLOGY	4	0	14	54	65	62	65	86	26	7	15	394
42	646	OPT.I POPULATION EDUCATION	4	574	3078	5495	5079	4214	3034	1809	830	830	599	25542
43	668	OPT.I VED (SAMVED)	4	5	0	0	0	0	0	0	0	0	0	5
44	669	OPT.I VED (SUKLA YAJURVED)	4	60	38	24	37	30	3	1	0	0	0	193
45	700	OPT.II HOME SCIENCE	4	0	3	0	0	2	0	0	0	0	0	5
46	703	OPT.II INDUSTRIAL EDUCATION	4	0	0	4	6	6	2	1	1	0	0	20
47	720	OPT.II FOOD SCIENCE	4	4	27	23	3	0	0	0	0	0	0	57
48	740	OPT.II MUSIC	4	0	2	8	22	21	2	0	0	0	0	55
49	762	OPT.II JOURNALISM	4	0	0	0	10	16	34	1	0	0	0	61
50	766	OPT.II TARK SANGRAHA (LOGIC)	4	0	0	0	2	4	1	0	0	0	0	7
51	768	OPT.II GRAMMAR (BYAKARAN)	4	33	26	25	36	31	29	6	3	1	1	191
52	769	OPT.II ASTRONOMY (JYOTISH)	4	7	7	7	1	0	0	5	2	0	1	30
53	ANS201	FARM MANAGEMENT & MARKETING	4	94	259	273	172	37	14	1	0	0	13	863
54	ANS301	AQUACULTURE & FISHERIES	4	214	240	223	136	30	6	1	0	0	14	864
55	ANS401	DAIRY & DAIRY PRODUCTS	4	86	270	269	173	39	13	1	0	0	12	863
56	ANS501	SMALL RUMINANT PRODUCTION & MANAGEMENT	4	219	297	192	98	36	8	0	0	0	13	863
57	ANS601	ANIMAL HEALTH-II	4	148	291	239	137	29	6	0	0	0	13	863
58	ANS701	VETERINARY LABORATORY TECHNIQUES	4	154	290	202	154	37	12	1	0	0	13	863
59	CIE201	ENGINEERING DRAWING	4	675	1030	639	218	28	1	0	0	0	5	2596
60	CIE301	ENGINEERING SURVEYING	4	463	930	807	306	81	5	0	0	0	4	2596
61	CIE401	BUILDING CONSTRUCTION	4	680	936	718	208	47	3	0	0	0	4	2596
62	CIE501	WATER RESOURCES ENGINEERING	4	744	1021	534	237	53	3	0	0	0	4	2596
63	CIE601	HIGHWAY ENGINEERING	4	629	1007	701	194	56	5	0	0	0	4	2596
64	CIE701	ESTIMATING COSTING & SUPERVISION	4	509	1011	728	259	77	3	2	0	0	5	2594
65	COE201	COMPUTER REPAIR & MAINTENANCE	4	691	620	560	242	82	10	0	0	0	26	2231
66	COE301	COMPUTER NETWORKS	4	567	748	547	272	63	9	0	0	0	25	2231
67	COE401	DATABASE MANAGEMENT SYSTEM	4	414	756	647	310	69	10	0	0	0	25	2231
68	COE501	ELECTRONIC DEVICES & CIRCUITS	4	247	644	795	411	98	11	0	0	0	25	2231
69	COE601	MICROPROCESSOR	4	154	692	852	413	77	18	0	0	0	25	2231
70	COE701	OBJECT ORIENTED PROGRAMMING	4	546	668	672	259	57	4	0	0	0	25	2231

DETAILS OF SEE RESULT OF REGULAR STUDENTS BY SUBJECTS 2075 (2019 AD)

S. No	SUB CODE	SUBNAME	Credit Hour	A+	A	B+	B	C+	C	D+	D	E	Abs	Total
71	ELE201	ENGINEERING DRAWING	4	153	228	203	139	69	10	0	0	0	17	819
72	ELE301	ELECTRICAL MEASUREMENT & INSTRUMENT	4	78	171	196	217	109	29	0	0	0	19	819
73	ELE401	UTILIZATION OF ELECTRICAL ENERGY	4	94	268	218	142	66	13	0	0	0	18	819
74	ELE501	ELECTRONIC DEVICES & CIRCUITS	4	57	149	281	195	90	29	0	0	0	18	819
75	ELE601	ELECTRICAL MACHINE	4	68	186	225	190	106	26	0	0	0	18	819
76	ELE701	INDUSTRIAL INSTALLATION & MAINTENANCE	4	74	214	206	209	78	19	0	0	0	19	819
77	EXT805	EXTRA MATHEMATICS	4	29	81	133	248	433	652	672	585	2333	4353	9519
78	MUC201	MUC201	4	0	0	2	3	1	0	0	0	0	0	6
79	MUC301	MUC301	4	1	4	1	0	0	0	0	0	0	0	6
80	MUC401	MUC401	4	0	0	5	0	1	0	0	0	0	0	6
81	MUC501	MUC501	4	0	1	3	2	0	0	0	0	0	0	6
82	MUC601	MUC601	4	3	1	2	0	0	0	0	0	0	0	6
83	MUC701	MUC701	4	0	3	3	0	0	0	0	0	0	0	6
84	PLS201	FARM MANAGEMENT & MARKETING	4	393	923	1052	533	221	34	0	0	0	30	3186
85	PLS301	AQUACULTURE & FISHERIES	4	687	956	830	507	144	33	0	0	0	28	3185
86	PLS401	VEGETABLE & MEDICINAL PLANT PRODUCTION	4	504	1288	881	371	98	14	0	0	0	30	3186
87	PLS501	CROP PRODUCTION	4	655	1287	862	264	82	6	0	0	0	30	3186
88	PLS601	INDUSTRIAL ENTOMOLOGY & MUSHROOM	4	382	1209	932	446	153	33	1	0	0	30	3186
89	PLS701	FLORICULTURE & NURSERY MANAGEMENT	4	565	1134	924	426	99	10	0	0	0	30	3188
														3709899

Appendix-I

Statistical Techniques used for Data Analysis.

Average Value=$\frac{Total\ Value}{Number\ of\ items} = \frac{\sum X}{n}$

$\sum X = X_1 + X_2 + X_3 + X_4 + \ldots\ldots\ldots\ldots\ldots\ldots + X_n$

n=Total number of items

X_1=selected numbers× Score =selected numbers × 5

X_2=selected numbers× 4

X_3=selected numbers× 3

X_4=selected numbers× 2

X_5=selected numbers× 1

Where,

S.A=5, A=4, U=3, D=2, S.D=1selected numbers=No. of checks (√)

Percentage of students= $\frac{\text{selected numbers}}{\text{Total number of items}} \times 100$