

Chapter I

INTRODUCTION

Background of the Study

The term 'Achievement' is defined in Oxford Advanced Dictionary as, 'the things done successfully, especially using their own efforts and skills'. Achievement is the tool for evaluating the students which helps to determine the quality of the students in their related areas. The common tool for student's evaluation is an examination. Basically, yearly, monthly and quarterly examinations are the major tools for the student's formal assessments.

The level of students are determined by evaluation applying different tools of achievement. The tools of achievement on examinations are obtained on the basis of oral, written, practical assessments. Oral, written and practical assessments can be reliable means for the determination of achievement of students. There are responsible factors for the student's achievement at mathematics such as teacher's qualification and education background, teaching techniques, instructional materials, individual difference, peer group, homely environment, parents attitude and socio-economic status, student labor and interest etc. These factor have been uplift the achievement and performance level of student.

Most importantly, the low achievement at mathematics in secondary level is not just an individual question, but it is an academic question, equally it is a political, economic, cultural and social question. Also it is also a nationwide question raised in Nepali education system.

In the context of Nepal, it was found that performance of many students was very low at mathematics in secondary level (Grade X/SEE). So it is necessary to study further to know the causes of low achievement of mathematics in secondary level. Thus, this study is aims to study the root causes of low achievement at mathematics in



secondary level.



According to mark ledger of 2071 SLC result, out of 56 students only 17 students were passed in mathematics and 39 students were failed. After implementation of grading system, the student's achievement in mathematics was presented below:

Table: 1

Grade Year	A ⁺	A	B ⁺	B	C ⁺	C	D ⁺	D	E	Total
2072	0	0	0	0	0	1	7	14	63	85
2073	0	0	0	1	0	0	7	15	44	67

Source: SLC Mark Ledger of Shree Bhanu Secondary School

Above table shows that, no one student obtained A+, A and B+ in the year 2072 and 2073 respectively. Similarly, the same table reflects that maximum number of students was secured E grade. Likewise, according to above mentioned table some students obtained D+ grade in 2072 and 2073 respectively. It shows that the achievement of mathematics is very poor in the secondary level.

According to the above mentioned table the learning achievement of students at mathematics is very poor. It is due to poor family background and ignorance of parents. Similarly, most of the students were from different culture, religious group, geographical area and multilingual community. Therefore the understanding level and learning environment are different from one student to another. It is difficult to teach effectively within a same class. That's why the learning achievement of Bhanu Secondary school is very poor in the mathematics. Being a student of mathematics, researcher thought it is better to find the causes of why there is low achievement at mathematics.

Statement of the Problem

Education enhances human abilities and aptitudes which are interpreted as a process of increasing knowledge, skills, and capabilities of all people in the country. In every sector, people have to use mathematical knowledge and skills to solve the any big numerical problems. So the implications of mathematics are huge in daily life to scholarly life. Mathematical calculations occur from a childhood of a person as addition, subtraction, multiplication and division.

Most of the students obtain low achievement at mathematics as it is technical and difficult subject. In the past days, most of the students in Nepal were found to be failed at mathematics every year in SLC/SEE examination such as in the year 2070, 44.24% students were secured below 32 marks and in the year 2071, 42.17% students were secured below 32 marks. There might be many causes behind this problem. The researcher here attempts to identify certain factors/causes which are more responsible factors for low achievement of student at mathematics. Researcher in this research proposes to find out the causes which has significant relationship with mathematics achievement. Thus the problems of the study concerned causes of low achievement at mathematics of secondary level in Kanchanpur district. The study has aimed to answer the following question:

-) What are the causes of low achievement of student on mathematics in secondary SEE examination?
-) How can the student's achievement on mathematics be improved?

Objectives of the Study

This study aims to explore the causes that affect the achievement of students in mathematics. More specifically the objectives of this study are as follows

-) To analyze the causes of low achievement of student in learning mathematics.
-) To suggest the possible ways for the betterment of student's achievement in mathematics.

Significance of the Study

Mathematics is very useful and most important subject from school level to university level. It is also useful for higher specialized course such as vocational, technical and professional education. Mathematics is significant at all level of school education system in Nepal. Mathematics is taught from primary level to secondary level as a compulsory subject for developing basic mathematical knowledge, which helps in further study. So, mathematical achievement was the major factor for student career development. In the modern world, all the sciences and technologies are based on mathematical knowledge. It was said that mathematics is backbone of human life as

well as education discipline. But mathematics has become the major subject of failure of student in SLC/SEE examination and it has become the greatest matter of worry. In this research it was studied that what are reasons behind the low achievement of student in mathematics in secondary level and which strategies could be adopted by school, teacher, education administrators as well as government for low achiever student to improve their achievement.

There are several studies on mathematics achievement since few years and they have contributed to view the poor achievement in mathematics. This study will be significant for making new approach to improve mathematics achievement. So the following are the significance of the study

-) This study is intended to find the causes of low achievement at mathematics which may be valuable for teacher, school, guardians, curriculum designers and other stake holders related to education system.
-) This study will be useful for NGOs, INGOs and other related organization.
-) This study will also open the door for the further study about the problems in mathematics teaching and learning.

Delimitations of the Study

This study has the following delimitations

-) This study was delimited to a public school inKanchanpur district only.
-) This is case study, so the case school was related in accordance with researchers convenience. The result of the study can be no more generalized.
-) This study only include the student of grade X and causes related to school home and individual.
-) This study was based on qualitative analysis so advanced statistical tools are not applied.

Definitions of Related Terms

Achievement: Achievement in this study is define in terms of score obtained by mathematics students at grade X

Public School:The school established and financed by government of Nepal

Evaluation:Evaluation is a systematic determination of a subject's merit, worth and significance

Reinforcement:The action of strengthening or encouraging something

Socio-economic status:The social and economic experiences and realities that help mold one's personality, attitudes, knowledge and lifestyle

Classroom environment:Interaction between teacher and student, activeness of teacher and student, availability of benches and desks and their siting arrangement, lighting and ventilation in classroom etc. are the factors of classroom environment. It is related to physical and psychological aspect.

Chapter II

REVIEW OF THE RELATED LITERATURE

The related study provides the researcher in making his research more realistic, precise, researchable and meaningful. In order to get better understanding in subject of study it is essential and helpful to survey the literature and study relevant and related to it. It is Considering these benefits in mind, researcher reviewed some related literature as presented below

Empirical Literature

Sapakota(2011), did a research on the topic “Causes of failure in mathematics at school (A case study of public school in Lalitpur district). The purpose of this study is to find the causes of failure in mathematics, to identify the strategies taken by school in improving mathematics achievement and to find the ways of additional support for low performer in mathematics learning. The researcher conducted the case study, qualitative research design as well as descriptive in nature. School document, Observation notes and interview guideline were used for data collection. The major finding of this study traditional teaching method, continuous communication gap with guardians, students had negative attitude to their mathematics’ teacher as well as the subject are the causes of failure in mathematics.

Likewise, Dangol(2012), did a study on “Causes of failure in mathematics” with the objectives to find out the causes of high percentage of failure in compulsory mathematics in SLC examination, to identify the strategies taken by the school administration in improving mathematics achievement and to find the ways of additional support for low performance in mathematics learning. He did a case study by taking mathematics teacher, a head teacher, three boys and three girls student as a sample. He has used observation and interview scale for data collection. It was found that the causes of failure in mathematics are traditional teaching style, lack of trained teacher, continuous communication gap between school and guardian. And it was found that school was trying to reduce problems related to failure in mathematics by managing extra classes, arranged new policies.

On Supporting these views,Chaudhary(2014),did a research work on “Causes of low achievement of Dalit Student in mathematics” with the objectives to find the causes of low achievement of Dalit student in mathematics and to identify the strategies adopted by school administration to improve mathematics achievement of Musahar student. This was the case study based on qualitative research design and descriptive in nature. In this study observation for interview guideline and school document are used as a research tools. The researcher was found that learning at home and school, parents education and economic condition, language, interpersonal relation, gender discrimination, irregularity of student, teaching strategies were the cause of the low achievement of Dalit student in mathematics.

Likewise, Paudel(2015), studied on “Causes of law achievement in mathematics” with the objectives to find out the causes of low achievement of grade VIII students in mathematics and to identify the strategies takes by school and teacher to

improving mathematics achievement. He delimited his study on Surya Jyoti Secondary School Lamjung. He had used school documents, class observation and interview guideline for data collection. It was found that low economic and education status of parents, poor learning environment in the classroom, student had negative attitude towards mathematics, school policy team hadn't concerned about mathematics, School policy and classroom management never encourage student are the main causes for the low achievement in mathematics.

Besides these, Shrestha(2016), conducted a study entitled "Factors affecting the achievement of Sunuwar student in mathematics (A case study in Ransnaluramechhap district). The purpose of the study was to find out the achievement of Sunuwar student in mathematics and to explore the factors affecting the achievement of Sunuwar student in mathematics. Based on qualitative descriptive research design researcher conducted a case study by using research tools observation form, interview and group discussion. It was found that lack of motivation is main cause of low achievement, student interest, economical factor, culture, society, lack of time to learn mathematics at home etc. are the factors that affects mathematics achievement. As well as lack continuous assessment in school, lack of new teaching methods with modern technology are the cause of low achievement in mathematics.

Likewise, Yadhav(2016), did a research basis on the topic "Determinants of low achievement in mathematics learning at secondary level. The purpose of the study was to find the school related factor responsible for low achievement in mathematics at secondary level and to find out school related factors are responsible for low achievement in mathematics at secondary level. The researcher was adopted the mixed research in general and survey research design was followed in particular and questioner and interview were used as research tools. The major findings of this study was school related factor had more effect on low achievement in mathematics.

Similarly, Yadhav(2016), did a research work on "Causes of low enrolment of the students in optional mathematics" with the objectives, to find the recent enrolment of student in optional mathematics and to explore the of low enrolment of student in mathematics. This was the case study in qualitative research design and studied that by using in depth-interview schedule, observation form and field notes as a data collection tools. Researcher was found that there were not satisfactory role played by teacher for proper for proper guidance, no special support for poor student, lack of encouragement to choosing optional mathematics, student choose optional mathematics by others force, uneducated family background etc. are the causes for low achievement of the student in optional mathematics.

By supporting above view, Adhiakari(2017), conducted a study entitled "factors affecting in Learning mathematics (A case study of domestic child labor student). The purpose of this study was to identify the learning environment of DCL student in school and to find out the major factors that affects in learning mathematics of DCL student. Researcher conducted the case study research with the help of research tools observation form, and interview schedule for data collection. It was found that the DCL student had unfavorable home environment for study but student are active and interested towards study. The major factor affecting the learning of DCL students were bad attitude of house owner, heavy work load, lack of pre knowledge.

Likewise, Khadka(2017), conducted a research work entitled on “Students’ achievement in mathematics at secondary level”. The purpose of this study was to compare the achievement of boys and girls student of grade X in mathematics and to find the causes of low and high achievement in mathematics. Researcher applied a mixed research design as method and data collection tools are questioner, Interview and observation. The major finding of this study was, in public school, the mean achievement of boys student was less than the mean achievement of girls student by 1.24, but in private school boys mean achievement is more than girls mean achievement. In over all mean achievement of boys student was less than the mean achievement of girls student in mathematics by 0.2. But there is no significant difference between the achievement of boys and girls on both private and public schools.

Theoretical Literature

In this section the researcher has studied the theoretical discussion which is related for the interpretation of the findings of the study. There are several learning theories related to teaching and learning process such as classical condition, Operant conditioning, Constructivism, cognitive and so on. To analyze and finding for suitable solution of the area of the causes of low achievement in mathematics; constructivism, become one possible theory.

Constructivism

Constructivism is a psychological and philosophical perspective contending that individuals form or construct much of what they learn and understand (Bruning et al. 2004). The major influence on the raise of constructivism has been theory and research in human development, especially the theory of Piaget and Vygotsky (Schunk, 2012).

Constructivism is related to educational theory which emphasize on construct, understanding and active role of learner to collect information. A key assumption of Constructivism is that People are active learner and develop knowledge for themselves (Geary, 1995). It is a philosophical and psychological view in which learner construct knowledge from his/her own understanding, experience and perception towards environment. Every student learns from social contact. Most of the educationist philosopher as well as the constructivist believes that the child learn social as well as individual activities by his/her own effort, interest and mental capacity.

In this theory the main role played by Piaget, Vygostky and Gestalt psychologists as well. According to their view a child/ learner is an active knowledge former. Their active or passive role in environment decide what and how much they learn. According to Bhattarai, (2071) two hypothesis are familiar on how a child can develop knowledge about anything. On the basis of these two hypothesis constructivist theory has been flourished.

1. Situated Cognition: According to this hypothesis child’s learning depends upon physical and social context. Situated cognition theory studies about the learners ability and circumstances, it is not about mental thoughts.

Thus, for acquiring knowledge to the children environment, circumstances and the surrounding matter.

2. Implicit theories: according to this hypothesis qualification, ability, credibility, motivation, perception of the learner are essential for child's learning. What are the appropriate methods of learning? What are the important things necessary for quality learning? Such types of queries are developed knowledge and skills.

According to Shunk, there are three types of constructivism which contain all types of constructivist theories develop now a days. These are

1. Exogenous: The acquisition of knowledge represent a reconstruction of the external world. The world influences beliefs through experience, exposure to models and teaching. Knowledge is accurate to the extent reflects external reality.
2. Endogenous: Knowledge derives from previously acquired knowledge and not directly from environmental interaction. Knowledge is not a mirror of the external world; rather it develops through cognitive abstraction.
3. Dialectical: knowledge derives from interaction between persons and their environments. Constructions are not invariably tied to the external world not wholly the working of mind. Rather, knowledge reflects the outcomes of mental contradictions that result from one's interactions with the environment.

In above, Exogenous constructivism is same as Vygostky's Social constructivism, which refers to the idea that that the acquisition of knowledge represents a reconstruction of structure that exists in the external world. Also Endogenous constructivism emphasize the condition of cognition action. Mental structure are created from earlier structure not directly from environmental information. Therefore, knowledge through a cognitive activities, which is same as Jean Piaget's Individual Constructivism. As well as Dialectical Constructivism holds that knowledge derives

from interaction between person and their environment. Construction are neither only depends on external world nor individual capacity. It is combination between persons and environment, both are correlated. This view was related to Banduras' Reciprocal interaction.

Conceptual Framework of the Study

This study was mainly concerned with the questions like what are the causes of low achievement of student in mathematics at secondary level. This is mainly based on the already explained theory Constructivism of mathematics learning. From above literature review, the researcher construct the following framework:

Fig: 1 Causes of low achievement in learning mathematics at Secondary level

This framework was proposed on the basis of this study "causes of low achievement in mathematics" was refined framework of the thesis conducted by Yadav(2016), a thesis submitted to department of mathematics education. Achievement is always affected by different factors such as school related , student related, parents related as this study was concerned to explain elements working for mathematics achievement. There are various causes that affect the mathematics achievement. Among them the researcher was choose six prominent factors(causes) using different theories and literature. These are evaluation and reinforcement process, qualification and teacher training, physical facility, classroom environment, time spend in practice and socio-economic status of family. These are the prominent causes that directly/indirectly affects the students learning achievement. Socio-economic status refers to the education level of parents, condition of family background and environment suitable for learner.

Chapter III

METHODS AND PROCEDURES

This chapter deals with the research methodology, which were used in this research. Research methodology is a strategy which determines how the research becomes systematically complete. Research doesn't mean only to collect data but also to use the appropriate research method. In this chapter researcher discusses about various aspects of the study such as design of the study, selection of the case respondents, data collection instruments, data collection procedure and data analysis procedure.

Design of the Study

Research design is plans and the procedures for research (Creswell, 2008). This is the case study to find the causes of low achievement in mathematics. So, qualitative technique was adopted in this study. Qualitative research can be regarded as 'naturalistic inquiry' in a sense that it is concerned in natural setting by trying to avoid any intentional manipulations and distortion of the environment of the informants by researcher.

Selection of Study Site

As a case study site the schools are selected on the basis of variations of culture and languages. The schools are situated in multilingual and multicultural society, where the students are from different culture and background. The students have economically different social and economic background as well. The researcher had selected Shree Bhanu Secondary School as a study site. The case school had selected on the basis of convenience sampling.

Selection of Case Respondent

The participants were the low achiever student on mathematics. Also the participants are the mathematics teachers, head teacher of the sample school and the parents of selected student of the sample schools. Only six students who have low achievement score on mathematics were selected from the sample school. Out of six participants there are three boys and three girls from different ethnic groups and from different social and cultural background.

Tools for the Data Collection

One of the most important steps of any research is collection of data. So this research was mostly focused on collecting convincing and authentic qualitative data from the participants. Every aspect of the study was analyzed and studied based on data collection techniques. There are different tools for the qualitative research design. To collect primary and secondary data for this study the following tools were used

Observation form

The direct observation form was used to collect the information about the teacher-student interaction, teaching-learning activities, classroom environment etc. In the observation form the researcher had focused on different

behaviors such as, school's facility, student teacher activities, and methodology and teaching materials used during teaching learning activities. All the factors were related to classroom teaching learning activities. In data collection procedure the classroom activities of one mathematics teacher were observed up to 15 days.

Interview guidelines

Semi-structured interview guidelines were adopted in this study. These guidelines were used to take interview from case students, head teacher, math teachers and parents of selected students, which was prepared on the basis of objectives of the study, conceptual framework and theoretical literature review related to this study.

School document

Students attendance register, school result sheet or mark ledger and the other records provided by case respondents and other related documents was also used as tools in this study.

Reliability and Validity of the Tools

Validity Refers to how well a test measure what it is purposed to measure. Reliability and validity of the research tools was determined with the help of related theory and subject expert. To determine the validity of research tools the interview was taken over a period of time with the selected samples. Further triangulation method had been adopted to maintain the trust of the study. The researcher also tried to ensure the internal validity by observing the same data on the basis of theoretical framework developed by researcher in previous section.

Data Collection Procedure

Data and information was collected by using interview schedule, classroom observation and school document. The school document was studied from mark ledger of students, student-teacher profile, physical facilities and other relevant document. The researcher was observed the classroom being presented in the school with mathematics teacher and student of grade X for 15 days of that selected schools. The researcher was observed the behavior of both teachers and students during teaching learning activities. The interview was taken with students, parents, mathematics teacher. All answers was noted down during the course of interview, focused point of interview on mathematics achievement of students, school facilities, vision of school towards low

achiever student, policies that were adopted by school for low achiever student and so on was conducted.

Data Analysis Procedure

After collecting data from selected sample using interview guidelines, classroom observation form and different school documents related to the case respondents, recorded data were analyzed, interpreted and presented descriptively. To analyze data, descriptive and analytic method was adopted based on triangulation method. The data collected from interview, classroom observation were analyzed descriptively on the basis of conceptual framework. Firstly, the researcher had constructed different them based on conceptual framework, Researcher had made interview guidelines and classroom observation form based on these themes. After that, researcher was collected required data from student, head teacher, mathematics teacher and guardians using these tools. The date collected from different respondents have been categorized according to the category of respondents and the different them and analyzed descriptively on the as per themes in the conceptual framework. After analyzing the collected data, we use triangulation method to conclude the research.

Chapter IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the analysis and interpretation of the collected information related to the research. The research studied the schools documents such as mark ledger, attendance, teacher profile and the records of the sampled students as well. Also the researched observed mathematics class of grade X being participated with mathematics teacher regularly for 15 days during teaching learning activities based on observation form. Then the classroom observation note was prepared on the basis of the classroom observation. Every activities and behavior of the student and teacher were carefully observed and noted. The direct interview was taken to the sampled student, mathematics teacher, head teacher and parents of sampled students. The responses of the respondents during face to face interview were carefully noted. There were no limitations for respondent's responses. They were express freely whatever they have in their mind. The data were analyzed with the help of collated data/ information from observation interview and school record.

Background of the Case site

For this research, researcher has chosen the Kanchapur district to get the exact data for the particular topic Kanchapur district lies in the province no 7 or federal Republic of Nepal. It is one of the Tarai districts situated in the far western part of Nepal. The climate of Kanchapur district is too hot in summer season and too cold in winter season, which is not good. Shree Bhanu secondary school is one of the oldest educational institutions which is located in Mahakali Municipality (Dodhara-Chandani). It is surrounded by Mahakali River and Jogbuda River.

Nepal is known as multi-cultural, multi-lingual and multi-religious country. Therefore, such diversities should be considered and observed in the every part of the nation in general and educational field in a particular. Similarly, the family background and learning environment of the school of the school were different from one society to another. However, the following days, many people are migrating from hilly region to Terai. So that, students cannot understand the language of migrated region, therefore, the language is also main causes of low achievement in mathematics.

According to census data 2068, there are one hundred and twenty three languages are spoken in our country. Similarly, in our country one hundred and twenty five ethnic groups' people are also living here. For instance, Dalits, Brahmins, Chhetries, Magar, Tamang, Rais, Gurung and so on. Therefore Students are from such diverse communities cannot equally Understand medium of instruction in the same classroom. However it is difficult to teach and make clear concept regarding subject matter in the context of Nepal. Due to ethical diversity the learning achievement of mathematics is very poor in the secondary level.

Most of the parents are farmers. Their main occupation is farming. Therefore, they are mainly based on agriculture. Likewise, some of the parents work in the government services. In spite of poor family background as well as economic status of parents hinders over the learning achievements of students in mathematics. Therefore, the economic condition of parents is also main causes of low achievement in mathematics.

In the previous days the infrastructure of the school was very poor but it is improved now a days. Therefore physical environment of the school also affects the learning achievement of student in the secondary level. Regarding sample school as Bhanu Secondary school it has five buildings with 48 rooms and a large playground. It has sufficient are as two Bigha. Although, there is sufficient environment in sample School but the achievement of mathematics is very poor according to SEE result. In the School there are seventy five students in grade ten, but the researcher had selected six low achiever students from grade ten.

In the following or coming days learning achievement of mathematics is very poor and low day by day. Due to culture, language, geographical region economic as well as family background of the parents, the achievement of mathematics is very poor in the Bhanu secondary school in a particular. Therefore, the government should provide sufficient teaching and learning materials to those low achiever students.

Physical and Instructional facility

Physical and instructional facilities are also the important factor which directly link teaching learning environment of school. It plays a vital role for improvement of student's achievement in mathematics learning.

Analyzing the data there were enough physical infrastructure like building, classroom, ground etc. But there weren't enough instructional materials in school, also no guidance for teacher for better performance of students. Physical infrastructure and environment of school consider as an essential part of school environment; however there is no conclusive evidence of the above facts. Thus the role of physical and instructional facilities plays a significant role in the better performance of school. So without managing good physical and instructional facilities in school, one can't improve the student's performance. Therefore, it is also the responsible factor for causes of low achievement in mathematics learning.



The physical facilities of schools play vital role in the sound environment and quality education. That helps to improve the achievement of students in mathematics learning. The classroom is considered as a heart and the school as the system. The school is located within the area of around two Bigha, the schools buildings are surrounded by compound walls, 5 separated buildings with 48 classrooms which are painted as well as ventilated as well. Among 48 rooms, 40 rooms were for teaching purpose and 8 were for official works, ICT lab and library etc. There was a library but there are not books related to mathematics reading other than textbook. The school had also a science lab. The school had about 700 students and 29 teaching staff and 5 non-teaching staffs. The school had no any provision for hostel and coaching class for SLC/SEE appearing students as well as others. Toilet and drinking water and well playground facilities were inside the school compound.

The responses of respondents about physical and instructional facilities were as follows:

According to Head teacher, *“The school has sufficient physical infrastructure but we haven’t teaching materials for mathematics. The school has science lab but not enough materials, school has ICT lab and library but no reference books and practice books related to mathematics. But the school is planning to manage those required materials for the better education.”*

Above view shows that, there was sufficient infrastructure in the school, but according to the head teacher’s point of view, they don’t have sufficient teaching learning materials for mathematics. In spite of science lab, ICT lab, library and other facilities in the school, students get chance to involve in the different activities. But in the library there were no reference books and practice books related books related to mathematics. Therefore, the achievement of student at mathematics was very poor.

By supporting this view the mathematics teacher also says, *“The school has not any reference books related to mathematics. Only textbook is read. Also school has no teaching materials; I am trying to use materials available in local area but they are not enough. I encourage students to study reference and practice books from different sources.”*

Similarly, according to mathematics teacher’s point of view, there were no reference books in the library which were related to mathematics. Due to lack of sufficient related materials in the school he/she cannot teach effectively. So that the achievement of students at mathematics was very low rather than other subjects, it shows that the teacher used no cost low cost materials while teaching mathematics but such materials are not enough for better achievement.

Also the students are agreed with head teacher and mathematics teacher by saying, *“Our school has good physical facilities; building, furniture, toilet, drinking water etc. Also, our school has a library but there is not reading materials related to mathematics.”*

Likewise, the student’s views show that, there were enough infrastructures in the school but they didn’t have sufficient reading materials in the school’s library, so that their learning achievement at mathematics was very poor.

Also the mathematics teacher said, *“The school has no any sources for instructional materials and educational promotions. The educational fee is the main source of fund but the guardians are not able for this. The fund provided by the donors is the basis of physical promotions.”*

From the above facts, the school has well organized in terms of external physical facility but it has not sufficient instructional teaching materials. Instructional materials make classroom more interesting and meaningful for learning. But only extra physical infrastructure of the school is not sufficient for quality education. Instructional materials plays vital role for quality learning. As a whole above views show that the main cause of low achievement at mathematics was lack of sufficient teaching and learning materials related with the subject.

Classroom Environment

The classroom environment includes the two important aspects. The first is physical environment; it includes the location of room, arrangement of desk benches chair, position of white board, facilities such as fan, ventilation etc. Another is psychological; it refers to the relationship of students and teacher to each other. As well as classroom environment includes teaching technique of the teacher, methods all psychological and educational factor related to teaching learning activities.

For collecting data, the researcher was observed the classroom environment participating with mathematics teacher while teaching mathematics about 15 days.

Episode 1

In the observed classes, mathematics teacher went into the class, then after researcher enter in the classroom with the permission of subject teacher, the all the students stood up and said good morning sir. It was noticed that the school environment was respectable to the teacher. Among 75 students there were 48 present in the class. The desks and benches were sufficient for them but not well managed. The white board was small. Usually, teacher opened the book and asked the homework but only few students done their homework but not properly. On the other hand the teacher started teaching without even warm up and reviewed the previous lesson, wrote the question from the book and solved the problems on the board. Teacher taught his own way but the maximum students were busy in talking to each other with peers. They have no concentration towards the study. It was like as the students had no interest about the lesson but teacher did not try to control and motivate them.

Then he writes the question from exercise and solves it. After, he gave one similar questions to students for classwork. Few students try to solve the problem, but teacher did not show any response towards these types of activities of students. Lastly, he gave some questions as homework and teacher existed from the classroom without summarized the lesson and without evaluate. These types of classroom activities were repeated day to day. Teacher had not a prepared plan, did not use any materials, he did not try to control the students noises. Only teacher came into the classroom and solved the question after that

existed from class. Also students did not try to complete homework, classwork; they had not pay concentration towards study.

From above observation, it indicates that physical environment of a classroom was not good. For example, furniture were sufficient but not well managed, while board was also small which was not enough in the case of number of student. Therefore, physical environment of the classroom was hampered to increase and improve students learning achievement. It can be said that physical environment is main factor affecting teaching and learning mathematics.

In the same way, the psychological environment of the classroom was good. There was good relationship between teachers and students. Teachers were respected but they couldn't warm up to motivate their students. Furthermore, the researcher also found that, the way of teaching was also not good. Students couldn't get chance to practice a lot in the classroom, they were talked while their teacher taught in the classroom. Likewise, the researcher also found that, the classroom was also noisy, he/she couldn't control. It was also found that neither the teacher repeated the previous lesson nor students done their homework. It indicates that the psychological environment also plays vital role to improve students learning achievement in a particular subject.

By supporting this view the head teacher says, *"There is good management in classroom, we are trying to improve classroom management but, there is not being regulated effectively because we have large number of student."*

Similarly, the mathematics teacher says, *"There is small white board in classroom and many students in a classroom. So we are unable to manage effective classroom management."*

Similarly the teacher says, *"Manystudent getting under poverty, so they can't afford necessary materials like copy, book, pens with them and they made some noises."*

But the students were not agreed with this view. One of the students says, *"Our Class is in good facility. But many of students make noise, so interested students cannot learn properly also."*

Furthermore, the researcher was also found that, the mathematics teacher only focused on text book rather than other practice books because there were not sufficient such materials. Moreover, students also did not pay attention on classwork so that the learning achievement of mathematics was very poor.

Above information also shows that, head teacher, mathematics teacher and grade ten students were not fully satisfied with classroom environment as physical and psychological environment of the classroom. Likewise, large number of students, poor family background of the student, it was difficult to improve learning achievement of student in mathematics.

As well as it was found that from above information collected from different sources the researcher found different understanding. Students were came from different cultural

and economic background, they have different interest towards mathematics they made some noise in the class as well as they were poor in basic knowledge, so they could not understand the content of secondary level, so they made noise. Teacher also unable to made interesting class. He neglected the student's noise; he had no interest to control student's noise. The management of benches and desks were sufficient for students but classroom with many students automatically made noise.

At the beginning of lesson the teacher directly entered into the topic without knowing the understanding of student. As well as teaching materials is best instrument in the period of teaching learning activities. The subject teacher can easily explained about the teaching lesson by using the effective materials. Besides textbook there were not any teaching material were used during teaching learning activities.

Teaching strategy plays a great role in the achievement of student. As well as Social construction says that motivation plays great role for learning, this makes classroom more interesting and encouraging. Teacher should become a facilitator in the classroom and should provide positive reinforcement. The positive reinforcement is always emphasizing in good learning. But the school hasn't adopted this approach in classroom teaching of mathematics. Thus it concludes that teaching learning process of school in the major aspects for betterment of student achievement teacher should pay attention to improve the condition of teaching and learning environment.

Thus traditional classroom is also a responsible factor for low achievement in mathematics. Further constructivism encourage the student to involve themselves in activities and use technique of learner centered, group work discussion learning by doing to gain high achievement.

Socio-Economic Status of Family

The major aspect which affects the learning of student is the task they do in their home. In Nepali public schools, it is not a new case to do more household work than school's homework by children. When student doesn't get a time to study on home because of the overload of house work, it hampers in the study. In classroom, student comes from different educational, cultural, economic and lingual background. And it is very challenging to adjust and teach those diverse children. So, socio-economic status of family is considered as one of the causes of low achievement.

About socio economic status of family of student the head teacher says, *"Students have low economic background, parents are illiterate and they have negative thinking towards learning. So, children have to help their parent's in house hold work."*

By supporting this view, the mathematics teacher says, *"Parents have low economic status. So, they have forced their children to earn money. Parents are illiterate and they are not aware of the children's study."*

In this regards one of the students says, *"My father is a shopkeeper. Sometime I have to stay in shop even, I have to go market for load goods."*

The similar version of about this problem one of the parents says, *“My health is not well. He has a great responsibility for the family. He spends all the time for household activities even he has to plough in the field.”*

From the above opinions of student and teacher, the researcher was found that students couldn't get time to do their homework due to their parent's socio-economics and cultural background. Their parents were illiterate so that they can't understand their children's problem. Furthermore, according to head teachers point of view the researcher found that parents had negative impact on teaching and learning. Therefore, they forced to involve their children in household work. So that the achievement of mathematics was very poor in grade X.

Likewise, the researcher also asked parents about the study of their children at home. Most of parents were illiterate and they were not conscious and aware towards their children's study. Moreover according to the mathematics teacher's point of view researcher also found that parents had low income so they had forced their children to join hands and mouth. In the same way, the researcher was also found that some of the students were from high economic family background so that they were also busy to help their parents at household work. Similarly, some of the students had busy to care their parents because their parents were suffering from different sorts of diseases.

Thus most of the students were poor and weak at mathematics due to their parent's economic status and household works.

Also in the question of researcher 'How is the parent's education influences in study?' The student says, *“My father and mother's academic qualification is under ten classes. So, they do not understand the problem of mathematics. We don't get any help for doing homework and other academic study.”*

Supporting students view parents says, *“We are illiterate, so we can't teach him/her.”*

From above views of students and parents, it is concluded that most of the parents are uneducated and they have lack of awareness regarding education that also impacts in the performance of children in mathematics. Education of family members plays important role in education of students. Uneducated family cannot guide their child properly. From the above views student do not get time to study. In mathematics practice plays vital role, but home environment of student is not good for doing practice. They haven't enough time to do practice at home because of household problems.

Due to academic qualification of parents students were weak in mathematics because they couldn't get further guidance which they had done their homework. Therefore, students couldn't get chance to practice as far as possible. So that, the learning achievement of students was very poor at mathematics on secondary level. Moreover, the researcher was also found that student's parents were illiterate so that they couldn't teach their children whenever they felt difficulty. Thus, the researcher has concluded that

educational qualification of parents also plays pivotal for to improve student learning achievement.

The responses about the effect of economic status in learning are:

According to Parents, *'It is very hard to pay tuition fees and for other particular materials.'*

By supporting this view students says, *"We can't afford coaching fee and tuition fees."*

The similar version of mathematics teacher about this problem as, *"Students are unable to buy extra materials like practice book, they do not able to pay fee for tuition."*

From the above responses, the researcher was also found that most of the students were from poor background so that they were not able to pay tuition fee. So that they couldn't get chance to take part in coaching as well as tuition classes. Therefore, the learning achievement of those students who were not takes part I tuition classes had very poor then other student. Similarly, the researcher was also found that the students who were very poor family background they couldn't buy practice book and other reference materials. So that, the students were from poor background couldn't able to go through extra materials than text book.

These views indicate that many students financial condition is poor and they are unable to afford the fees and others. They were unable to pay fees for extra classes, so they become weak in mathematics. Therefore economic status is another cause of low achievement of students in mathematics.

Evaluation and Reinforcement Process

Teaching is a science as well as an art. A well trained teacher only can use different teaching techniques in the classroom to address all types of problems of different students. Before teaching any lesson, systematic plan is necessary to meet a goal. The plan about objective of lesson, activities to be performed at classroom, techniques of student's engagement in cooperative tasks and assessment techniques to be applied in and outside of classroom are of great importance.

Assessment of student into classroom had usually been implemented and measured using limited forms of tasks generally referred as "Paper pencil test" emphasizing logical process of calculation deduction and organization skills. Also the teacher had applied the questioning techniques during assessment of student.

The researcher asked the question about the evaluation system to the head teacher, math teacher and student and their respective parents.

The head teacher says about evaluation system of this school, *"The school conducts examinations: first terminals, half yearly and annual exam, three times in a year. But other tests are not used and all other tools of evaluation process depend upon the subject teacher."*

Supporting head teacher's view mathematics teacher also says, *"Terminals exam, half yearly exam and annual exams were conducted by school. But other techniques are not used."*

From above views there were only summative types of evaluations were used. For betterment of student learning in mathematics different approaches of evaluation are used. In this question, student says, *"Teacher gives homework but we don't care about doing homework as well as teacher also careless about to check. Written exams three times a year conducted by school."*

From the above opinions of head teacher, students and mathematics teacher the researcher was found that the evaluation system was only based on paper pencil test. According to their point of view, they were conducted first terminal, half yearly and annual exam in thrice within a year. But other tools of test and evaluation were not used such as quiz contest, group work, project work and group discussion etc. So that the student couldn't get chance to involve extracurricular activities which were very beneficial for improving learning achievement of the students. Furthermore, the researcher was also found that the students didn't complete and do their homework. Moreover, the teacher was not aware to those students who didn't do their homework. Thus, it can be concluded that evaluation system, tools of test, extra-curricular activities are also important for better learning. Such tools and activities plays vital role to improve learning achievement of students in mathematics.

Evaluation as well as reinforcement is one of the most important aspects in learning. The view of head teacher, math teacher and students showed that there is lack of regular assessment system in the school. There was also a lack of reinforcement and encouragement. School as well as parents are also careless about their children's achievement, which shown by head teachers view, *"We provide student progress card (mark sheet/grade sheet) at the end of periodic exam. But parents are not interested towards their children's progress. Nobody comes to school for asking their children's achievement, their improvement."* In similar way mathematics teacher also says, *"Parents had no interest about their child's study achievement."*

From above view of head teacher and mathematics teacher researcher found that student as well as guardians has no interest about children's study because if parents had interest about their child's learning improvement they ask this with head teacher, mathematics teacher about improvement.

In this topic parents says, *"We do not go to school to consult about our children's achievement and their study to the teacher."*

The above sources show that, most of the parents were careless towards their children's progress. The parents of student had never consulted to the math teacher about their children's progress. Similarly, the researcher was also found that parents as well as students were not go to school to know about their achievement in the case of mathematics. Moreover, according to the head teacher point of view, the school provide mark sheet at the end of the annual examination but no one parents came to take mark-

sheet in the school. It shows that parents were not responsible towards their children's learning achievement. Thus, the researcher can say that the role of parents is very important in the case of difficult subject in the secondary level. Parents should encourage and motivate their children to increase competency, capacity, confidence and understanding the problem themselves. They can improve themselves.

Researcher found that there was a communication gap between parents and school. Every parent does not regularly consult with teachers about their children's progress. Thus it could be said that the school maintain a proper communication with parents.

When parent's opinion was asked on effect of their education on children's achievement, one of the parents says, *"I'm illiterate but sometime my father-in-law can guide the children in the simple problem."* By supporting this view another parent says, *"We are illiterate and the children are left to themselves for their homework."*

From the above responses of respondents, researcher found that the literate parents help their children yet this is not sufficient for secondary level. But illiterate one simply fulfills their duties by sending their children to school. So this study found that the parent's education can be most essential motivation and support to improve the student's performance level. If there is no proper guidance of the guardian at home they become careless in their study. Parents support is one of the great reinforcement for children as well as it plays great role for motivation.

According to the parent's point of view, they were illiterate so that they couldn't guide their children for further improvement of their secondary level children. But some of the parents were educated though they would help their children while they felt difficulty.

Teachers Qualification and Training

The research was focused on finding the causes of low achievement of student in mathematics. It was found during the study that many students are being failed in mathematics. The research found that the teachers' knowledge regarding particular subject matter is not sufficient but also they need to have pedagogical knowledge and ability to know the psychological condition of children and their interest. Teacher competencies in these are closely linked to student thinking, understanding and learning capabilities at mathematics and understanding it.

There is no doubt that for the student best achievement in mathematics requires a firm understanding of a teacher in the subject matter and new techniques to make the subject matter easy for the all kinds of students in simple language. Recurrent teacher training has been adopted as major strategies for enhancing the quality of student achievement. It is assumed that increased opportunity for professional development through recurrent training would lead to improve professionalism deduction and motivation which will positively contribute to student learning. There could be many factors causing a regular relationship training and student performance.

The view of mathematics teacher about teacher competencies in mathematics education were *"School hasn't provide any refresher training for our knowledge and*

betterment of teaching even though I'm trained teacher. School doesn't have sufficient teaching materials and reference book. Training and qualification are most important factor in development of teacher competency."

This view indicates that there is lack of teacher competency in math education. There wasn't any refreshing and need based training. So, the case school should improve this problem for betterment. The school does not provide any opportunities for the professional development of their teacher.

By supporting this view the head teacher also says, "*We are unable to collect sufficient materials reference books because of lack of economic sources and we aren't able to provide refreshing training for the teacher; we have not any permanent economic source."*

The above views reflect that most of the teachers were trained but they didn't have in-service teacher training from the school side so they were unable to improve the learning achievement of mathematics. Similarly, there were not sufficient teaching and learning materials in the school. Due to poor reference materials they didn't improve mathematics result in the case of SEE examination. Furthermore, the stake holder as head teacher's point of view they were not able to collect reference materials due to poor and low income of their school. Similarly, they were not able to provide fresher training to their teachers who taught mathematics in the secondary level. Likewise, they did not have permanent economic sources for school. Thus, the researcher can said that reference materials, in-service teacher training and economic condition of the school play important role for better learning achievement of the students. They are directly related with each other on absence of one another couldn't be able to fulfill.

Episode 2

The observation was took place during the case study; it was done at mathematics period in class X in the observation day, the math teacher entered in the classroom and used the same regular materials. He wrote the topic "Problems including three sets" and writes the formula $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$ after that he wrote the problem from exercise and solve step to step in the white board. But student were busy on side talking. After that teacher gave same problem to the student for classwork but only few students try to solve that problem and show teacher for correction but the other students were busy on whispering and teacher did not care. The teacher did not response them at all rather he turned again towards white board to solve another problem. At the end, teacher gave a problem to solve at home and he left out the class.

The above observation shows that the teacher taught through deductive way. At first teacher presented formula and then he entered in the exercise based question. Similarly, the teacher used teacher centered way so that the student were busy to talk with each other while the teacher taught in the classroom. Likewise, the teacher provided same problem for further practice but only few students did and others were busy to talk with their fellows. Furthermore, the researcher was also found that the teacher didn't care those students who were busy to talk with each other in the classroom. The teacher had solved

the same sort of exercise on the board and did not pay attention towards students. In the same way, the teacher provided homework and left the classroom. It can be concluded that teacher should pay attention towards his/her student while teaching otherwise students while teaching otherwise students lost opportunity of learning. Classroom environment hampers the learning which is directly related with learning achievement of the students. Therefore, teacher's role is very essential while teaching in the classroom for better performance of the students. The teacher should provide exposure to those students who are very poor in mathematics. That's why they can improve themselves.

Similarly, researcher observed few other classes and found that there was no change in teacher's activities. By above observation, there is no any motivation and reinforcement class from teachers as well. Teacher was trying to use student centered method by giving some questions to student for self-practice but not properly. This shows that there is no sufficient teacher competency and interaction method with students in the classroom.

Although the teacher considered being the main facilitator of students while teaching learning activities inside the classroom, there was a poor condition of teaching delivering to the students by math teacher. And there was no any subjective teaching training for teachers as the revised course so it is also the main causes of low achievement in mathematics.

Whether teachers are teaching in the classroom, students are busy in side talking and teasing each other. Researcher asked "why don't you try to control the noise in the classroom?" On this occasion mathematics teacher replied, *"It is difficult to motivate the secondary level students by telling stories, tales, jokes and other funny chats because they have already familiar most of the terms from mobiles, internet and other social media. It is not the time to scold and under pressure because it has the new government policy from the post. It has declared, child oriented teaching learning environment, fearless learning plan and other self-learning discipline are generated day by day. Actually, secondary level is not the time for motivate in learning they must have innate, inborn desirous, interest in learning new things."* As well as he said, *"student did not get the fundamental knowledge and skills from the junior classes. Actually they have the lack of fundamental skills to match the secondary level. Due to this it is much difficult to learnt mathematics in this level."*

Knowledge and skills must be developed from the lower classes. If they did not have their habitual concentrating power to reading and writing, it is difficult to draw the affection in such field in terms of study. That has the main cause of the problem to teach in secondary level. Simply moral behavior and social functions are learnt from the young age. How to teach? How to motivate them? And how do we convince them? It is not easy task for the subject teacher. So the authorized agency, educational researcher and experts must manage the training seminar and other skill developing program to develop the professional skills. So that teachers are facilitated different types of psychomotor aspects according to the need of time.

Time Spend for Practice

It was found that teaching learning process is completely based on traditional teaching for good and quality learning and good or bad result. Student's activeness was the vital thing if some good students want to learn something. Unless the student study actively by themselves, teacher's teaching only cannot be sufficient. As we have the famous saying 'practice makes man perfect'. Practice is the main and basic thing in mathematics.

It is also important to do repetition of the all chapters by students at home to remind the things that they study in the classroom. Constructivist suggests that learning is more effective when a student is actively engaged in the learning process (Acharya, 2072). So, the student's active participation in class, their interaction with teachers and repetition of the ideas in the home are the essential things for best result of the students.

Another things that, student have to do classwork & homework and has to involve in group discussion. If the students have any confusion they have to ask either with friends or with teachers without any hesitation. About activeness and their practice and tasks here are some responses which are as follows:

Mathematics teacher says, *"I scold the students as much as I can, but students don't do their homework and they do not give attention in the classroom while teaching."*

On supporting the above view head teacher says, *"Students activeness on study in the classroom and the children's study time in the home is decreasing day to day."*

Accepting these views of math teacher and head teacher students says, *"I do not want to study math and I feel it must difficulty to read it."* In similar way another student say, *"I feel so difficult so, I don't do task at home and I don't get any guidance from anyone at home."*

As well as the parent's views on their student's activeness as, *"We never see our child studying at home. We don't tell him to do household work yet he/she doesn't give time to study."*

From above responses, the researcher was found that students were scolded but they didn't complete their homework. Similarly, they didn't pay attention in the classroom while he/she taught in the classroom. Likewise, the researcher was also found that student didn't provide a lot time for practice in the classroom as well as at their home. Furthermore, they were decreased time for practice day by day. Moreover, according to student point of view the researcher was found that student felt mathematics as a very difficult subject and complex subject the other one, so that they didn't pay attention towards it. They didn't get any feedback and further guidance at home. According to parent's point of view, the researcher was found that children never had done their homework even though their parents didn't tell them household work.

This concluded that, maximum number of students have shared their thought as mathematics as a hard subject. Student has no interest towards study mathematics. It is concluded that children are more interested on entertainment activities rather than

academic study. Because student did not show their interest even they had no burden of household work. The above responses show that the role of the student was passive, class was totally delimited by teacher. Social constructivism demands that the learner should play an active role in the learning process. It also emphasis on more student centered approach in classroom but the case school has not adopted this approach classroom teaching. As well as student should give more concentration also time to practice mathematics than other. Therefore practice helps to increase achievement of mathematics. Students are active learners and they construct knowledge for themselves. Therefor the parent as well as teacher should provide sufficient time for practice.

Also teachers have to apply different teaching methods in teaching for student centered approach and to have effective teaching learning activities and to get better result. Also student must be concerned and interactive with the teachers inside and outside the classroom. There is a lack of active participation between student-student and student-teacher. So, active participation should be compulsory for effective performance of students. Hence participation in classroom and time spend of students in practice is also the important factor for better performance of student. Thus, student participation in the classroom, their activeness, and their focused plays great role in student achievement. Only few students were doing homework and class work that is ultimately leading to the low achievement of students at mathematics.

The researcher asked the question about the achievement of students to the head teacher, math teacher, students and their respective parents. The responses were as follows:

"The mathematics achievement of our school's students is not satisfactory." – Head Teacher

"The achievement of students in mathematics is very low." - Mathematics Teacher

"We usually fail in mathematics because it is hard"- Student

Above data shows that the achievement of mathematics was not satisfied. Similarly, the achievement of mathematics was very low. Mathematics was very hard and difficult for students; therefore, maximum number of students was failed in the mathematics. Thus it can be said that, the achievement of student in mathematics is very low because the students felt very hard and difficult to read mathematics subject, also the teacher do not teach every chapter in effective way and they not used teaching materials according to the chapters.

Students are so passive in learning new things. They do not have little conscious in teaching learning sequence. On this sense the headmaster said, *"They are very poor in economic status, in terms of fulfill the daily needs and requirements forcefully engage in domestic tasks and search other income oriented profession instead of going to school. They get something if they engage in work but they do not get at once by means of reading. If, they directly participate in work that facilitate up bring the child and facing the easiness of feeding. Due to this, their mind diverts to the non-academic environment."*

For the supposition of this statement mathematics teacher said, *“Majority of the students are going to ‘Kalapahad’ (A place of India where Nepalese are going to participate in work) and some are fully engaged in labor task in local area. Their main function is to earn money and solve the domestic problems. Due to this they are deprive of educations through money.”*

According to the students, *“we do domestic work as a whole day so we do not have a time to read and write. Due to this we feel mathematics is more complicated than the others with lack of regular practices. After that we did not interest in study.”*

On supporting this view guardians said. *“We encourage our child to read and write but we are unable to guide them because we are illiterate. Our children ask the question, we are unable to reply the answer than they live in passive mood.”*

From the above aforementioned statement, student are well participate in short term profit than then the long term or life long career formation task due to their backwardness. They are doing that for compulsion for someone whether their interest also. Through this they are deprived of education. Students do not get the solution on the spot so their interest and need also on that field decreasing day by day, no doubt.

Thus the researcher concluded by all above evidences that, main causes of low achievement in mathematics which are irregularity, lack of active participation in classroom, lack of interaction between teachers and students. And, irresponsive nature of teacher inside the classroom for example some students are busy in chatting while teacher is teaching but teacher’s ignorance on it. Also, there are other reasons like, poor economic condition of parents, lack of parent’s education and awareness. Similarly, other reasons are lack of reinforcement in classroom by the teacher, unplanned learning environment, and not continuous evaluation procedure, lack of teacher training and lack of instructional facilities.

The analysis reveal that majority of the student get ‘E’ grade due to their poor family background, educational qualification of the parents, lack of sufficient teaching and learning materials. Likewise, most of the students were failed and get ‘E’ and ‘D’ grade in SEE. This is because; the school not provides good environment and exposure to those students who had low achievement in mathematics. However, at practice level the teacher should start the lesson in time, content should be review, they should prepare lesson plan. Moreover, teachers should motivate those students who had low achievement in mathematics.

This study was mainly concerned with causes of low achievement in mathematics. On the basis of the students failed in mathematics due to economic background, careless of parents, ignorance of head teacher, awarelessness of mathematics teacher. There is not sufficient teaching and learning materials in the school. Similarly, the school should not conduct extra classes for those students who were very poor in mathematics. It can be said that the teachers, parents and school administration should consider those students who are poor and less motivated towards teaching and learning

Chapter V

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATION

The main purpose of this particular research is to throw light on the problems of low achievement of students at mathematics, find the causes of problems, analyze them and to show the findings of study. Thus, this chapter deals with the findings and conclusion of this study, this chapter states summary of the research, major findings of the research and conclusion and recommendation for the further study.

Summary

Many sources prove that not only in Nepal many of the schools are obtaining low marks at mathematics, but also it is happening all over the world. Teaching learning method and the learning activities as well as environment is the main thing to get quality result at mathematics. It is becoming like a fact that 'all can learn mathematics' but on the other hand achievement in mathematics shows that the condition is miserable. The research tried to find causes of low achievement in the sample schools of Kanchanpur District. Providing individual right to education and managing classroom with different cognitive level to bring out common educational outcomes is a matter of problems to the school administrator.

This case study has been done to find the causes of low achievement in mathematics. The researcher had selected Shree Bhanu Higher Secondary School on the basis of convenience sampling. As the researcher is also a local residence of this area and the school was facing problems of low achievement in mathematics so the researcher has selected this school for case study. After selecting the appropriate tools of data collection for this particular research such as, observation, interview schedule, group discussion with principals, parents, mathematics teacher and the students. The researcher went to all sample schools and personally studied relevant documents of the student's progress sheets and records. How students learn mathematics depends on children's opportunities to learn at schools and at home, interaction and discussion with friends and teachers. As we know each child has innate potential sets of abilities so he/she needs opportunities to display that individual potential. Thus, the creation of a safe learning environment is necessary for students. In this research, the researcher analyzed the school's physical and psychological environment, school policies, teaching learning strategies, assessment techniques, facility at home, home environment and relationship among teachers, students, parents and communication as well as individual factors to find out the causes of low achievement in mathematics.

Findings

On the basis of presentation, analysis and interpretation of the data, major findings of the study have been summarized as below:

- J It was found that lack of sufficient teaching learning materials student as well as mathematics teacher did not get opportunities to practice in mathematics.
- J It was also found that environment of school was not good. The relationship between teacher and student was not good. Due to lack of interaction achievement of mathematics was very low.
- J Teacher's didn't motivate and repeat previous lesson in the classroom.
- J Mathematics was difficult subject. Most of the parents were illiterate so that they didn't provide further guidance and feedback in mathematics.
- J Student didn't pay attention while the teacher taught in the classroom. They didn't complete their classwork as well as homework properly.
- J It was also found that parents couldn't pay tuition, coaching fee, couldn't buy reference materials because they were very poor.
- J Students were very busy in the household work.
- J School administration, mathematics teacher should conduct extra-curricular activities which are related to mathematics.
- J Students should be motivated from parents, head teacher and mathematics teacher's side.
- J School administration should collect reference materials for better achievement and further practice.
- J Parents should provide enough time to practice at home. Similarly, they should consult the school administration, subject teacher frequently about their students' performance and earning.
- J Mathematics teacher should give a lot homework and check regularly.
- J Extra classes should be conducted for poor and low achiever students.

Conclusion

Classroom practices and the curriculum must be closely linked while teaching inside the classroom, practice solving system and interaction is the main things while studying mathematics. Achievement of students is always affected by different variables such as school's learning environment, physical infrastructure, learning materials, psycho-social activities knowing children's interest, leisure time at home for homework and for entertainment to the students at home, reinforcement and feedback class at school, equal evaluation and monitoring of each child in the class. Student's activeness inside the classroom with the help of teaching materials are the main things that directly affects children's good result. Most importantly the changed and new teaching style of teachers in the age of science and technology are mostly needed to build a competitive student in the competitive world.

Teacher's beliefs about the nature and purposes of mathematics and how students learn have powerful effects on the quality learning and for good outcomes. Although the school seems to have sufficient physical infrastructure, teacher service commission appointed educated teacher, teachers found unable to maintaining teacher's personality adopting new techniques and new way of preparing teaching materials to make easy for children to understand any concept. The teachers seem careless on doing classroom immediate practices with students. No interaction of teachers and parents about children's progress and condition at schools also created passiveness on students.

Recommendation

From the above findings and conclusion, the researcher would like to do the recommendation for the improvement of teaching learning process at first then after good result and satisfied student's achievement at match to claim quality education. In the context of many Public schools of Nepal, many of the students are negated and not properly treated even to get the quality education and even they are failed at mathematics and facing the great challenge throughout their career.

Although the schools seem having qualified, trained and experienced teachers are working at public, continuous assessment system, implementation of operational mechanism and its continuous analysis not being implemented. So the government also has main role to improve the condition to providing different training to the teachers and adequate number of teachers and proper Budget to change the condition in education.

This research mostly has been done on the basis of the case study of selected sample schools so the other schools can be represented on this but the results may not be generalized in all situations. It is due to lack of time and resources, Researches had to rely only on some schools to do the research. The result and conclusions of this study generated some other questions which need to be verified. Some of them are presented as follows-

A. Recommendation for educational implication

-) The school should manage the instructional materials to improve the quality of education.
-) Schools should manage extra classes for low achiever student.
-) Student centered methods and other new techniques should be focused.
-) Teacher should apply the recent methods of mathematics teaching.
-) Teacher should provide the mathematical concepts according to their pre-knowledge.
-) Students should focus on practice and repetition and focus on student activeness within classroom learning.
-) Role of student should be changed; they are not a passive learner. Student should be more active inside the classroom learning and outside of the classroom.
-) This is the age of science and technology; different innovative technologies are invented to teach and coach the students. Thus, teacher must be updated with modern innovative technology.
-) Non-testing devices of evaluation should be used in student evaluation from national levels.
-) Evaluation is most important component of instructional procedure. Thus, at the end of the lesson we must check the student performance with the proper evaluation tools. Similarly, feedback should be given immediately for the correctness of learner.

B. Recommendation for further study

-) A similar study can be done for other classes and other subject.
-) What sort of policies and mechanism should be adopted to promote mathematics achievement?

- ∫ One can should study about why students are less interested in mathematics.
- ∫ Why teachers are careless towards teaching and learning in mathematics although they are trained?
- ∫ This study is limited, so it can be done district wise or nation wise.

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Appendix-A

Guidelines for Interview Schedule with Student

Name Age: Sex

School Name:

The interview schedule with students was taken on the basis of following guidelines:

Socio Economic Status of Family

- Parent's education, occupation, family member, work load, help, facility
- Opportunity to learn at home

Classroom Environment

- Peer group
- Teaching learning activities, method, learning situation(fearful/ free)
- Opportunity to ask question, interaction with teacher, teacher response on student's curiosity
- Evaluation system, feedback, starting of the lesson, ending of the lesson
- Classroom management
- Relation between teacher and students
- Teacher's behavior toward students

Physical infrastructure and safety

- Instructional materials: nature and effectiveness, Mathematics lab
- Time spend in learning and practice
- Causes of low achievement in mathematics

Appendix-B

Guidelines for Interview Schedule with Mathematics Teacher

Name: Age: Sex:

Qualification: Teaching experience:

Training:

Schools Name:

The interview with mathematics teacher was taken on the basis of following guidelines:

Student Home environment

- Parent's education, status, education
- Help of parents on study, financial support

Classroom Environment

- Space, black board, number of student
- School environment, student's activeness
- Relation between teacher and student as well as teacher and guardian
- Physical infrastructure: Building, classroom, instructional materials etc.

Instructional Techniques

- Teaching learning activities, methods, materials, homework/classwork
- Environment for student, opportunity for asking question
- Evaluation process, feedback, reinforcement
- Causes of low achievement in mathematics

Appendix-C

Guidelines for Interview with Head Teacher

Name:

Sex:

Age:

Qualification:

Experience of Head Teacher:

This interview with head teacher was taken on the basis of following guidelines:

- Physical Facility of school: building, playground, classroom etc.
- Teacher's qualification and experience
- Classroom management
- Instructional material, library
- Use of instructional techniques
- Relation between teachers and students
- Evaluation system
- Views on mathematics achievement
- Views on student's achievement in mathematics
- Views on socio economic background of student of the student
- Role of school management committee for the betterment of school
- Role of Parents Teacher Association: PTA for the betterment of school
- School's relation with guardian
- Policy for low achiever student

Appendix-D

Guidelines for Interview Schedule with Parents

Name: Age: Sex:

Address: Religion:

Education:

Occupation:

Annual Income (approximately):

The interview with parents was taken on the basis of following guidelines:

Socio economic status of family

- Economic condition, Society
- Work load for their child

School's status and policies

- physical infrastructure and safety, policy, educational fee
- school environment in learning for student
- Rules and principles for students and teachers
- Learning environment

Learning achievement

- Child's learning achievement, achievement in mathematics
- Reading opportunity at home
- Improvement of their children's achievement
- Relation with school staff
- Child's interest, peer group
- Their support for study
- Causes of low achievement

Appendix-E

Classroom Observation Form

Name of the Teacher:

Length lesson:

Topic:

S.N		Good	Satisfactory	Poor
	Teacher			
1.	Appearance: i) Cleanliness ii) Self-confident iii) Pleasing			
2.	Start on time			
3.	Content review			
4.	Prepared lesson plan			
5.	Motivation			
6.	Instructional Material			
7.	Concept of content			
8.	Summary of lesson			
9.	Class work			
10.	Encouragement for learner			
11.	Evaluation: i) Written ii) Oral			
12.	Interaction with student			
13.	Confident over content			
14.	Homework			
15.	End on time			
	Student/Learner			
1.	Concentration on lesson			
2.	Curiosity for learning			
3.	Participation on discussion			
4.	Communication with teacher			
5.	Completion of homework			
6.	Confident			
8.	Ask question			
9.	Answer relevantly			
10.	Follow direction			
	Classroom Management			
1.	Light and ventilation			
2.	Black/White board Placement			
3.	Seat arrangement			

Appendix-F

Teacher's Status of Case School

S.N	Name of Teacher	Qualification	Subject	Training	Remarks
1.	Mr. YagyrajPandit	M.Ed.	Nepali	Trained	Head Teacher
2.	Mr. Narayan Datt Bhatt	M.Ed.	Science	Trained	Vice principal
3.	Mr. PrakashBdr Chand	MBA, B.Ed.	Account	Trained	
4.	Mr. LaluKhadka	M.com, M.A	Bus. Std.	Untrained	
5.	Mr. DambarDatt Joshi	M.A, B.Ed.	English	Trained	
6.	Mr. Rajendra Pd. Badu	M.A, M.Ed.	Education	Trained	
7.	Mr. Deepak BdrKhadka	BCA, M.Sc IT	Computer	Untrained	
8.	Mr. Deepak Buda Kshetri	M.Sc	Physics	Untrained	
9.	Ms. Mina Thapa	M.Sc	Chemistry	Untrained	
10.	Mr. MahendraKarki	M.A	Mathematics	Untrained	
11.	Mr. DilBdr Singh	B.Sc, B.ED.	Mathematics	Trained	
12.	Mr. Nafu Singh Saud	B.Sc, B.Ed	Mathematics	Trained	
13.	Mr. Krishna Bdr Chand	M.com, M.A(Eco) M.A(Sociology), M.Ed.	Account	Trained	
14.	Mr. SureshaGiri	M.Sc IT, B.Ed, B.Sc CS	Computer	Trained	
15.	E. Rohit Kumar Bist	B.E. Computer	Computer	Untrained	
16.	Mr. Kumbha Singh Dhanadi	M.A(Pol. Sc + Eco), B.Ed.	English	Trained	
17.	Mr. BhandariRatanDhan Singh	B.com, B.Ed	Social	Trained	
18.	Mr. Shankar Singh Dhanadi	M.A, B.Ed	English	Trained	
19.	Mr. IndraBdrTer	M.A, B.Ed	Math/Science	Trained	
20.	Mr. Ganga Singh Bhandari	M.Sc. IT, M.A	Computer	Untrained	
21.	Mr. Padam Singh Saud	M.Sc CS (Run)	Computer	Untrained	
22.	Mr. Gorakh Singh Saud	M.A, B.Ed		Trained	
23.	Mr. Keshab Raj Joshi	B.Ed		Trained	
24.	Mr. SiddharajOjha	M.A, B.Ed	English	Trained	
25.	Mr.IshwariBhandari	I.ed		Trained	
26.	Ms.SobhaThapa	I.ed		Trained	
27.	Ms. ManrupaShahi	I.ed		Trained	
28.	Ms. Jayamala Saud	I.A		Untrained	
29.	Mr. NaradDatt Bhatt	M.Ed(Run)			Accountant
30.	Mr.Govinda Singh Dhami	BBS			Accountant
31.	Mr. BikashKhadka	T.SLC			
32.	Mr. Narayan Datt Joshi	I.A			Office Assistant
33.	Mr.ManBdrSijali	SLC			Office Assistant
34.	MsLaxmiThapa	Literate			Swapper

Appendix-G**Physical Facilities**

S.N	Description	Quantity	Remarks
1.	Play Ground	2 Bigha	
2.	Buildings	5	
3.	Classroom	48	
4.	Toilet	16	Boys, Girls and Staff
5.	Library	1	Concrete
6.	Desk & Benches	200/200	
7.	Chair Table	200	
8.	Drinking Water Tap	4	