

**CLASSROOM PARTICIPATION AND ACHIEVEMENT LEVEL OF  
STUDENTS IN SECONDRY LEVEL MATHEMATICS**

**A  
THESIS  
BY  
SWETA CHAUDHARY**

**FOR THE PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF MASTER IN EDUCATION**

**SUBMITTED  
TO  
DEPARTMENT OF MATHEMATICS EDUCATION  
CENTRAL DEPARTMENT OF EDUCATION  
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KATHMANDU, NEPAL  
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त्रिभुवन विश्वविद्यालय  
शिक्षा शास्त्र केन्द्रीय विभाग  
**गणित शिक्षा विभाग**

TRIBHUVAN UNIVERSITY  
CENTRAL DEPARTMENT OF EDUCATION  
**DEPARTMENT OF MATHEMATICS EDUCATION**

विश्वविद्यालय क्याम्पस  
कीर्तिपुर, काठमाडौं, नेपाल

UNIVERSITY CAMPUS  
Kirtipur, Kathmandu, Nepal

पत्र संख्या:-  
Ref.

मिति:  
Date: .....

### Letter of Certificate

This is to certify that Ms. Sweta Chaudhary, a student of academic year **2072/73** with campus Roll No. **264**, exam Roll No. **7228411**. Thesis number **1743** and T.U. Registration No. **9-2-225-0521-2011** has completed this thesis under supervision and guidance of Mrs. Sarala Luitel during the period prescribed by the rules and regulation of Tribhuvan University Kirtipur, Kathmandu, Nepal. The thesis entitled on **“Classroom Participation and Achievement Level of Students in Secondary Level Mathematics”** has been prepared based on the result of her investigation conducted during the prescribed period under the department of Mathematics education, Central department of education, University Campus, Kirtipur, Kathmandu, Nepal, I recommend and forward that her thesis be submitted for the evaluation as the Partial Requirement to award the degree of Master of education.

Date: 26<sup>th</sup> June, 2022

.....

Prof. Dr. Bed Raj Acharya

(Head)



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Ref.

मिति:  
Date: .....

**Letter of Approval**

This thesis entitled “**Classroom Participation and Achievement Level of Student’s in Secondary Level Mathematics**” submitted by Ms. Sweta Chaudhary to partial fulfillment of the requirement for the degree of master of Education has been approved.

**Viva-voice committee**

**Signature**

Prof. Dr. Bed Raj Acharya  
(Chairman)

.....

Prof. Dr. Binod Prasad Dhakal  
(External Examiner)

.....

Mrs. Sarala Luitel  
(Supervisor)

.....

Date: 30<sup>th</sup> June, 2022



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### Recommendation for Acceptance

This is to certify that Ms. Sweta Chaudhary has completed her thesis entitled **“Classroom Participation and Achievement Level of Student’s in Secondary Level Mathematics”** under my supervision during the period prescribed the rules and regulations of Tribhuvan University Kirtipur, Kathmandu, Nepal. I recommend and forward her thesis to the department of Mathematics Education to evaluate in final viva-voice.

.....

Mrs. Sarala Luitel  
(Supervisor)

Date: 26<sup>th</sup> June, 2022

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iv

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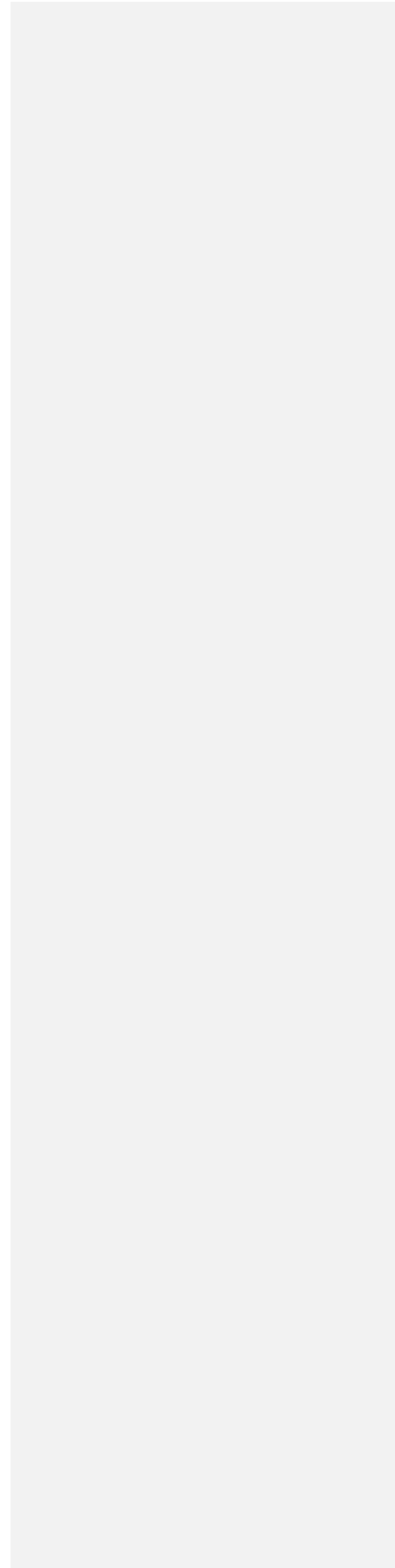
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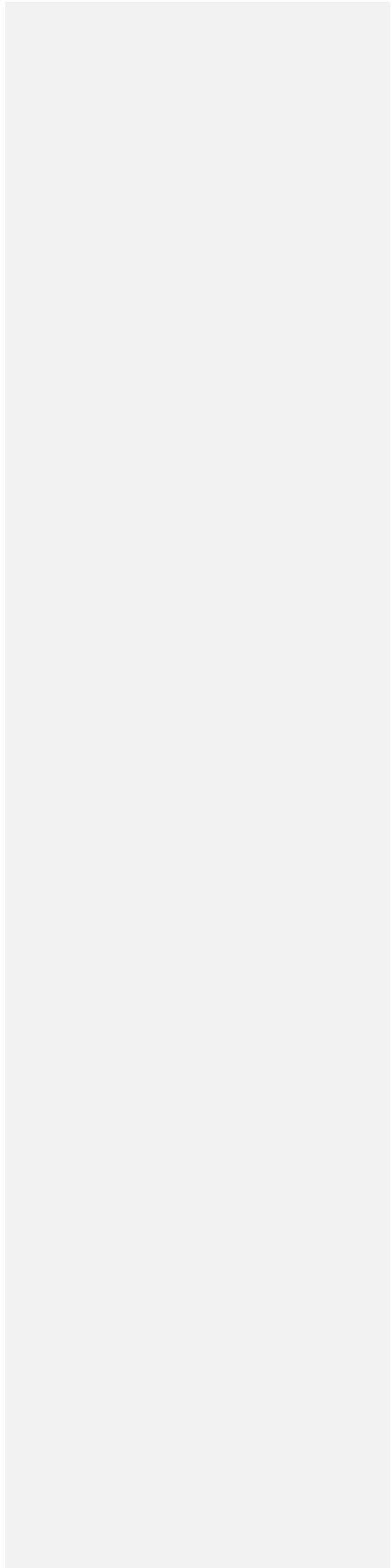
**Declaration**

This thesis contains no material which has accepted for the award of other degree in any institutions. To the best of knowledge and belief this thesis contains no material previously published by any authors except due acknowledgement has been made.

Date:

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Sweta Chaudhary



**Dedications**

I want to dedicate this thesis to my Father Mr.Tarani Prasad Chaudhary and Mother Mrs. Sarita Singh. They have always been a source of inspiration in my life who have spent their whole life to transform me from nobody to somebody.

### **Acknowledgement**

Firstly, I would like to express my gratitude to my respected madam Mrs. Sarala Luitel her consistent guidance, warm support and encouragement. This thesis would have taken the present form without her intellectual guidance.

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.....  
Sweta Chaudhary

### **Abstract**

This study entitled “Classroom Participation and Achievement Level of Student’s in Secondary Level Mathematics” is focused on the factors affecting participation and achievement in mathematics at secondary level students toward mathematics. The objectives of this study were to identify the factors that affect of the participate and achievement in mathematics and to analyze the strategies taken by school to promote mathematics achievement. It is case study and qualitative in nature. This study was conducted with the sample of one school, where two guardians, one head teacher, one mathematics teacher and five students through convenience sampling were selected. Face to face interview with students, head teacher, math teacher and parents were taken. Classroom observation was done for four times with different days during teaching learning activities. The collected information from teachers and students were analyzed with the help of theoretical and conceptional framework developed by the researcher.

I found that the participation and achievement level of students in mathematics learning. Similarly, the factor affecting the participation of students in mathematics learning are poor economic condition of the family, negative social belief and tradition, household work load, cost of education, lack of motivation, psychological effect, home environment, school environment were the problem of participating the students in mathematics class. To improve the learning capacity of students in mathematics, they should be motivated to be regular in school, necessary materials should be provided to them from the school, there should be discussion between students, teachers and parents.



	x	Field Code Changed	... [43]
		Field Code Changed	... [44]
		Field Code Changed	... [45]
		Field Code Changed	... [46]
<b>III METHOD AND PROCEDURE .....17-21</b>		Field Code Changed	... [47]
Design of the Study.....17		Field Code Changed	... [48]
Selection of Study Site.....17		Field Code Changed	... [49]
Data Collection Tools .....18		Field Code Changed	... [50]
Classroom observation.....18		Field Code Changed	... [51]
Interview .....18		Field Code Changed	... [52]
School documents .....19		Field Code Changed	... [53]
Data Collection Procedure .....19		Field Code Changed	... [54]
Data Analysis Procedure.....20		Field Code Changed	... [55]
<b>IV ANALYSIS AND INTERPRETATION OF DATA ..... 22-45</b>		Field Code Changed	... [56]
Analysis of Student’s Class Attendance According to School Record.....22		Field Code Changed	... [57]
Analysis of Student’s Classroom Interaction According to Grade Room .....23		Field Code Changed	... [58]
Observation .....23		Field Code Changed	... [59]
Analysis of Students Extra Activities Level (H/W, C/W and C/T) .....24		Field Code Changed	... [60]
Analysis the Participation in Mathematics of Students According to Interview		Field Code Changed	... [61]
Paper .....25		Field Code Changed	... [62]
Respondent A.....25		Field Code Changed	... [63]
Respondent B.....26		Field Code Changed	... [64]
Respondent C .....27		Field Code Changed	... [65]
Respondent D.....27		Field Code Changed	... [66]
Respondent E .....28		Field Code Changed	... [67]
Major Factors Affecting the Participation of Students in Mathematics Learning 29		Field Code Changed	... [68]
Teaching/learning process .....32		Field Code Changed	... [69]
Parental education and economic status .....35		Field Code Changed	... [70]
Home environment.....36		Field Code Changed	... [71]
School environment .....37		Field Code Changed	... [72]
		Field Code Changed	... [73]
		Field Code Changed	... [74]
		Field Code Changed	... [75]
		Field Code Changed	... [76]
		Field Code Changed	... [77]
		Field Code Changed	... [78]
		Field Code Changed	... [79]
		Field Code Changed	... [80]
		Field Code Changed	... [81]
		Field Code Changed	... [82]
		Field Code Changed	... [83]
		Field Code Changed	... [84]
		Field Code Changed	... [85]
		Field Code Changed	... [86]
		Field Code Changed	... [87]
		Field Code Changed	... [88]
		Field Code Changed	... [89]
		Field Code Changed	... [90]
		Field Code Changed	... [91]
		Field Code Changed	... [92]
		Field Code Changed	... [93]



**List of Tables**

**Page No.**

Table 1: Class Attendance of Students .....22

Table 2: Interaction Position of Students.....23

Table 3: Extra Activities Level of Selected Students .....24

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Field Code Changed

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Field Code Changed

## Chapter I

### INTRODUCTION

#### Background of the Study

Education plays a significant role in the development process of a country. Every country in the world is leading along the progressive way by means of education. Education, in its sense, aims to transfer the ideas, skill, attitude, experience and knowledge of people in the community. Education is the backbone of development. It is also stepping stone to development. It means education is most essential part of human life. But education cannot perfect in itself without mathematics.

Mathematics is a part of education of an individual in educational process. The educational process of mathematics is intimately involved in every moment of a man's life today. The study of mathematics has been proved as an urgent factor in the field of science and technology as well as higher study. It helps people to understand and interpret very important quantitative and qualitative aspects of living and natural phenomena. In this modern age understanding and interpreting every discipline, the stage of mathematics is essential. The importance of mathematics was related from primitive age not only the modern age. The mathematics has been utilize to solve the difficulties arisen by natural calamities, political purpose, economic planning and other social events. In the ancient period, most of the mathematical structures, rules, formulae etc. were the outcomes of the empirical mathematical. But now, the empirical (practical) mathematics has been developed into abstract mathematics theory. "Oriental literature reveals that mathematics was originated former practical experiences", (Eves, 1982, p.22). Mathematical is like a language and a basic tool of communication. Daily translation and communication involve the frequent use of

mathematical concepts. Without having the knowledge of mathematics now, it is very difficult to understand other disciplines such as, chemistry, physics, social science, economics etc.

The term "achievement" is defined in Oxford Advanced Lerner's Dictionary as "the thing done successfully especially with effort and skill". But in general, it is a measure of an individual's present level of skill, knowledge or a measure of an individual's present level of teacher, teaching experience of teacher, intelligence of each individual students, social background of students, class situation are the important factors that achievement of the students.

There is also a general belief that activities of students during the classroom instruction govern the achievement of students.

"The achievement of main scores of students in grade IX who less participation in classroom was found whereas the achievement of main scores of the less participate students in all of the other three subjects (English, Mathematics, Science) were slightly lower than that of more participate in classroom students."

Finally, the achievement level of students in mathematics is very low all over the country, The study was mainly concerned to find out the achievement level of Siraha District students.

### **Statement of the Problem**

This study is mainly concerned about the participation and achievement level of students in mathematics subject. In general, it can be seen that mathematics is an essential part of one's daily life. In the official works or house hold works or field works, everywhere more or less mathematical knowledge is required and in fact, in every working field people are using mathematics with or without knowing the mathematical knowledge and in fact, in every working field people are using

mathematics with or without knowing the mathematical concept. So, children also need mathematical concepts for performing their daily tasks who does not go to school for gaining formal education. Such pupil can be categorized into 3 parts as such as, some learn mathematics formally, some informally and also some non-formally. Despite this fact, those pupils who learn formally can be seen to be fragmented into students and comparatively made me realize that the participation of students in mathematics subject is very low in comparison to other subject. Since, mathematics is considered difficult by the students, many students rejects math subject. So, I want to do research in this topic in class IX students in Shree Janta Secondary School Siraha District. Therefore, I was try to search the answer of the following questions:

- ) What is the level of Participation of students in mathematics?
- ) What is the level of achievement of students in mathematics?
- ) Do students differ in achievement according to their classroom participate?

#### **Objective of the Study**

The study was intended to accomplish the following objectives:

- ) To analyze the relation between participation and achievement level of students in mathematics.
- ) To dig out the background causes of their participation level.

#### **Significance of the Study**

Mathematics is being a key subject in the school curriculum throughout the world. It is very useful in our daily life as well as in the development of science and technology. Every task of our life is directly and indirectly affected by mathematics. In our country, it has been taught from pre-primary to secondary level as a compulsory subject. The objectives of mathematics teaching is to develop the

reasoning ability of the students. Thus, it is quite natural that mathematics is given more important place than language in school curriculum. Mathematics generally holds an a compulsory subject for all students up to the end of their school life.

This study was concerned with the participation and achievement of students in mathematics. The researcher tried to investigate and find out the factors participation and achievement level of students in learning mathematics at secondary level. This study would help to find the solution of existing problems of related field. Especially, this study is important for the following significance.

- This study helps to identify the problems that might be seen in mathematics teaching and also to show the way to solve them.
- This study helps to motivate for encourage to the students to study the mathematics.
- The study helps to bring positive attitude in equal opportunity in learning mathematics.
- This study provides the information will be helpful to understand the participating.

#### **Delimitation of Study**

The study was conducted within the following delimitation.

- The study was conducted only for the subject of mathematics.
- This study was limited only among grade IX students.
- This study was limited only participate and achievement level of students in mathematics.

#### **Operational Definition of the Terms**

**Achievement.** Achievement in this study is defined in terms of the mathematics scores obtained by the selected students in class IX examination.

**Learning.** Learning is the process of obtaining or acquiring knowledge through different experience. Knowledge or skill gained through education is also known as learning.

**Level of Achievement.** The level of students which can be determined by achievement scores of students.

**Level of Participation.** Level of participation in this study in term how much power or influence participants actually have.

**Participation.** Participation in this study defines in term of class attendance, class room interaction (with teachers and other students) and extra activities (like homework, class work, class test etc.) of students in grade IX.

**Secondary School.** The school based on the class IX to XII is known secondary school. In my study secondary level indicates grade IX.

## **Chapter II**

### **REVIEW OF RELATED LITERATURES**

This chapter began with its empirical review, theoretical construction, theoretical review, 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 and to receive some ideas for developing a research design.

Review of literature is an essential part of students. It is discovered 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 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 participation and achievement level of students in grade IX mathematics subject.

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 Nepalese context could not be found. Despite the fact, few related litterateurs had been reviewed as follows.

Research in any sector of skill wants a suitable studied with the works in which there 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 become identify of what has been established, 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 have been reviewed in order to explain the present of the study.

### **Empirical Literature**

This empirical literature includes the different research in the area of this study. Each and every research work required the knowledge of previous background and observed, and measured phenomena to obtain the target objectives and to validate the study. Empirical review deals with the book articles, journals, thesis and internet, and so on. Several types of related literature review were received in this study which helps to make their concept clear for study and also directs to analyze and interpret the data. I have reviewed some literatures and researches related to my study presented.

K.C (2001) has conducted research on the topic, "A Comparative Study of Achievement in Mathematics of Primary level Student of Chhetri, Tharu and Kami Castes in Surkhet District." The main objective of this study was: To compare the mathematics achievement of the primary school going pupils of Chhetri, Tharu and Kami Communities of the district of Surkhet. For the data collection, the researcher developed an observation form and a set questionnaire. For the collection of data, the researcher visited sampling. This study is quantitative in nature and the conclusion of the study was: Chhetri student achievement significantly higher than the Tharu and Kami students in the district level achievement test. There is no significant difference in the achievement of Tharu and Kami although Tharu and Kami student mean achievement was found to be higher than those of Kami, Chhetri and Kami students are found scattered through many parts of district where as Tharu students remain confined within certain school.

Pant (1978) did an experimental research work on "Effectiveness of the use of unit test results in enhancing pupil achievement in mathematics" with the objective 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 students from one school by systematic sampling and thought eight units from textbook. Unit test were given at the end of each unit in experimental group. A comprehensive test has given the multiple-choice completion items. He found that the achievement of two groups differed significantly.

Railman (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 school of Kathmandu Nagar Panchayat Area with 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 girl with respect to achievement in mathematics as a school subject with regard to achievement in mathematics by area and also cognitive levels.

Guragie (2001) did research on "A study of achievement in mathematics of primary level of 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 Tarai and Hilly region of Koshi Zone. Researcher developed an achievement test from the prescribed curriculum of grade V. Four hundred students from twenty four school were selected. Z-test was applied to

conclude that Morang district surpassed Dhankuta district students in every aspect male, female, rural, urban.

Pokhrel (2001) had studies entitled. "Mathematics achievement in school leaving certificate examination between public and private school students at Kaski district." The main conclusion of this study was to mean achievement score and correlation of private school students in compulsory and optional mathematics was greater than public school students 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 students school achievement". He concluded the important factors related to student's school achievement in mathematics are classroom behavior (time spend in learning, students attention, method of teaching).

Yadav (2001) did a survey type research carried out on topic " A study on the effectiveness of the primary school teacher of the district of Sirha" with the objectives to explore of effectiveness parameters in determining the effectiveness of primary school teachers and to compare the effectiveness of rural and urban primary school teaches. 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 teacher were found to be effective. The effectiveness of urban teachers was not found to be significantly different from those of rural teachers.

Pant (2002) has conducted her study on the topic, "A Study of Achievement and Participation of Female in Bachelor Level Mathematics Education." The main objective of the study were to compare the mathematics achievement of male and

female in mathematics learning in B.ED level and to find out the factor affecting participation of female in mathematics learning in B.ED. For the data collection, the researcher developed a form of table and set of questionnaire. For the collection of data, the researcher visited sampled campuses which by random sampling. The conclusions of the study were:

There is no difference in mathematical achievement in higher education by gender/sex. Social factor such as discrimination behavior, economic condition, lack of time for hard labour are responsible for making lower participation of female in the study of mathematics.

Baral (2005) did research on the topic "attitude of orphan student towards mathematics and its relationship with their achievement" he had found that the orphan student have positive attitude towards mathematics. The mean attitude score of orphan boys was 80.48 and their S.D was 12.70 similarly mean attitude score of orphan girl was 88.66 and their S.D was 11.17. He found that there is significant difference between orphan boys and girls students attitude towards mathematics. He found that orphan boys achievement status is better than orphan girls in lower secondary level compulsory math. There was significant relationship between orphan students attitude towards mathematics and achievement in this subject.

Subedi (2005) studies 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 mid positive effect on the mathematics achievement. The physical interest of the learner has low positive effect on mathematics achievement.

Acharya (2006) did research on topic "A study of attitude of Secondary School students towards mathematics and its relationship with their achievement in mathematics". He has analyzed the obtained data with their various statistical methods can such as mean, standard deviation, co-relation coefficient, t-test etc. All difference are tested at 0.05 level of significance. From the data analysis his findings are the students studying in both types of school has similar attitude towards mathematics could be detected, the mean measure of the attitude of boys toward mathematics was significantly higher than that of girls and the coefficient of correlation between attitude and achievement of Secondary School student's measure of attitude towards mathematics were significant.

Giri (2008) "A critical analysis of SLC Compulsory Mathematics scores 2063." Intending well educational out comes the states has finance large amount of 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 student's achievement. Factors or variable such as student's gender, as parent's education, occupation, location of school, student's 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.

Dhakal (2008) has conducted on the topic "Mathematics achievement of Grade VI students in Kavre District." The objectives of this study were find out the

mathematics achievement and to compare the mathematics achievement of students studying institutional and public school. For data collection, the researcher visited sample schools which is analyzed statically in term of mean, S.D. and t-test. The conclusion of the study were mathematical achievement level of grade VI is satisfactory. The achievement level of students, studying in institutions school is higher then student studying public school. The achievement level of girl and boy students are almost same.

Baral (2011) has studies entitled "Causes of failure mathematics in SLC examination (A case study of school in Bharatpur)." In his study he found school related factors are associate with school environment, physical facilities, teacher's behaviors, 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 lerner 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 causes of failure in mathematics in SLC examination and to suggest the main causes of bring improvement in result by finding the improvement programmer that can be carried out in school level. The population of his study student's 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 eight school in which forty boys and forty girls from the population of 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 subject (i.e., com. mathematics, science, opt. mathematics).

The mathematics teacher was able to address the varied cognitive levels of students in the classroom while teaching. The school was trying to reduce the problem of mathematics failure by managing extra classes in the evening.

Basel (2007) has concluded on the topic, "The Relation of Socio-Economic Status in Mathematics Achievement of Dalit Students at Primary Level." The main objectives of this research were to find the socio-economic status and mathematics achievement of dalit students, and to determine the correlation between socio-economic status and mathematics achievement of dalit students. The researcher used the tools for data collection as questionnaire and observation. The researcher selected ten primary schools by purposive sampling. For the collection of data the researcher used a table and bar diagram which analyzed statically mean, S.D and Correlation Coefficient. The conclusion of the study were: the mean score of educated father's children is the higher score than other (agriculture, trade caste specific). The mean score of small family size children obtains the higher score than middle and large family size children's scores. The variable father's occupation and family income were positive correlated each other but negative correlated with family income were positive.

### **Theoretical Review**

In the section, the researcher introduced 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 constructivism, cognitive learning, socio-culture, multiple intelligence, human capital theory and so on. So, for the analysis and interpretation of data I used Socio Constructivist Learning Theory because this theory primary focus on students centered method. Teachers have a

dialogue with students, helping students construct their own knowledge (active learning) and students work primarily in groups.

### **Social Constructivist Theory**

Social constructivism is a kind of learning perspective focuses on social activities. It gives importance to the culture context in understanding what appears in society and constructing knowledge based on this understanding. Social constructivist believes that reality is constructing through human activity. I will found that there is inferiority complex among the students that they cannot do mathematical subject as perfectly to other subject. This belife among the students should be dismantled. Students can do mathematics more effectively then the other subjects but they should give time to their study. Due to lake of enough tuition time at home and at school be given enough study time at home and encouraged to involve in group discussion. Then this misconception of inability of students to do mathematics will fade away.

For social constructivist reality cannot be discovered and it does not exit prior to its social invention. To social constructivists, knowledge is also a human product is socially and culturally constructed (Earnest, 1997). Individuals create meaning through their interaction with each other and with the environment they live in. In the view of social constructivism, learning is a social process. It does not take place only within an individual, nor is it passive development of behaviors that are shaped by external forces. A learner cannot learn in isolation, so meaningful learning occurs only when individuals are engaged in social activities. Students can't learn mathematics subject frequently then they should engage in group discussion and interaction with their peers without any hesitation. I will took one secondary school and I found why students poor participate in the mathematics classroom and also obtain the poor mark in compare the other subject mark.

Social constructivist theory is one of theories to analyze and interpret data of mathematics on resolve the problems. This theory encourages the students to involve themselves actively and use technique for learner centered, group discussion, learning by doing, use outside feels to be more practice and gain high achievement in mathematics rather than classroom. Therefore, I used the social constructivist theory as theoretical framework in my inquiry.

### Conceptual Framework

The conceptual framework devised through the Literature studies facilitated to attain research, get the answer of the research work. Analyzing various literature in relation to participation and achievement level of students in mathematics subject. The following is the framework for this study:

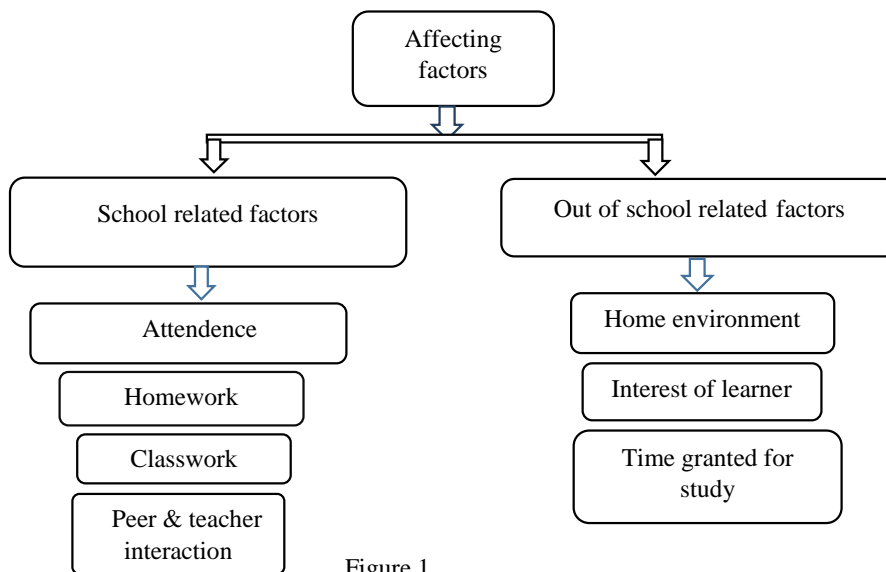


Figure 1

Source: Walberg (1981) Wilkins et al (2002)

From the above table, it is found that there are many sort of factors which affect in mathematics learning. Mainly it is categorized into two factors as school

related and out of school related factors. In the school related factors basically there are four crucial factors that is attendance, homework, class work, teacher interaction. On the other hand, there are three out of school related factors which are home environment, interest of learner, time schedule.

### **Chapter III**

#### **METHOD AND PROCEDURE**

The chapter begins with its design of the study, population of the study, sample and sampling strategy, study area/field, data collection tools, 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, so I choose methodology. The chapter explained the plan and method of study which helped to achieve the objective of the study

##### **Design of the Study**

A case study is a study which investigates the answer of specific questions (Gillham, 2000). The research design of this study was qualitative with case study approach. Qualitative research is multi method involving approach, to its subject matter (Acharya, 2016). The objective of this research is to analyze the classroom participation and achievement level of students in secondary level. It was a case study about the causes of classroom participation and achievement level of students in secondary level at siraha district. This study was primarily based on qualitative research design. The objective of this research demands qualitative research. This research work is explorative as it focuses on factors affecting participation and achievement level of students in learning mathematics.

##### **Selection of Study Site**

Study site of my research Shree Janta Secondary School, Dhangadhimai Municipality of Siraha district following purposive sampling. Shree Janata Secondary school is nearly my living place. I know that there are many dalit students are living

and they have main problem of to gain education and obtain good achievement.

Therefore, I was choose this school as my study site.

### **Sample of the study**

This research was qualitative in nature. So, the sample size in this study was small. Qualitative inquiry typically focused in small sample, I was select a purposeful sampling procedure that serves the qualitative data sources to my inquiry because my research was only inquiry the class IX students participate and achievement level. I was select appropriate sample as two-mathematics teacher and class IX students for interview. Therefore, the sample size of this inquiry depends on the purpose of research and credibility of the study. Sample of the study should be gain data for the research.

### **Data Collection Tools**

One of the important parts of study is data collection. In this study I was perform classroom observation, do interview and look at school documents. The brief discussion of the tools depicts below:

**Classroom observation.** Observation is the act of watching somebody carefully for a period of time, especially to learn something (Hornby, 2000). The observation was also necessary to fulfill the objective of the study. So, the researcher used observation form to collect necessary information to find out the participation level of selected students in which observation form contains homework, grade work, grade test, interaction level (with teacher and other students) of the students. So, classroom observation was help to measure the participation level of selected students.

**Interview.** Interview is the common tool of data collection. For collecting information and data with related topic, I had conducted in depth interview with one-

mathematics teacher, one head teacher, two parents and five students based on interview schedule. With the help of interview schedule, I had tried to dig out participation and achievement level of mathematics in classroom as well as try to dig out the ways used by teacher to make classroom interesting for every student.

Kerlinger (1986) describes, interview as “a face-to-face interpersonal role situation in which one person, the interviewer, asks a person being interviewed, the respondent, questions designed to obtain answers pertinent to the purpose of the research problem.” This approach is one of the best known to collect data in short time.

**School documents.** School document is a tool of data collection. School documents provide information about student’s achievement level. I can see five students’ class test copy, midterm exam papers, attendance register and study activity also. With help of school documents, I can find five students’ mathematics achievement level in secondary school.

#### **Data Collection Procedure**

I visited the selected area, to take consent from the school stakeholder, and built up good rapport with the information provider. After developing the indicators of classroom participation and achievement and validate by the help of the suggestion of experts. Then I had observed teaching learning activities. In addition, I observed how the teacher and students interact to each other. During my research I observed every remarkable activity of teachers and students. I interviewed with the samples to whom I had selected for study. I had used interview guidelines. For the unclear concepts, I had provided some explanation where they needed. In order to know the achievement of students in the school, this method was performed.

### **Data Analysis Procedure**

The quality of any research work depends upon the set of tools or method of data collection and technique use to analysis I adopted the general inductive approach for qualitative analysis of data I had search the raw data from the field notes, document analysis and interview schedule then transcript the interview data with the consideration of research objective. I categorized the raw data according to my research question and objectives. I had generated findings quality standards, credibility, transferability, dependability and conformability as follows:

**Quality standards.** After completing the research tools, it is necessary to maintain quality standards of research. Guba and Lincoln (1998) suggest the following criteria to maintain the quality standards. Therefore, I followed these criteria to maintain quality standards. Therefore, I followed these criteria to maintain the quality standards:

**Credibility.** This concept replaces the ideas of internal validity; by which researcher seek to establish confidence in the truth of their findings. To maintain credibility of my research I tried to spend as much as the observation needed and engaged with with different mathematics educators and students. After getting information, I wrote notes; I asked similar type of questions to other people and tried to find real practices from that information.

**Transferability.** Transferability replaces the concept of external validity. To maintain transferability, I had tryed to capture most of scenario by thick description of classroom observation, interview and school documents.

**Dependability.** This concept replaces the idea of reliability. This is the tried standards and refers to the stability or consistency of the inquiry processes used over time. To maintain I had present the logic used for selecting people and events to

observe. I would try to maintain credibility and transferability to ensure dependability standards.

**Conformability.** This refers to the quality of the results produced by an inquiry in terms of how well they are supported by informants who are involved in the study and by events that are independent of the inquiry.

## Chapter IV

### ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with analysis and interpretation of the collected information. In this chapter, I explore how the data analyzed. This chapter considered as the mirror of whole research. I analyzed and interpreted the collected data through the classroom observation, interview and school document. I had conducted at Shree Janta Secondary School Betaha Bhawanipur, Siraha related upon five students. The main objectives of this study were to identify the participate and achievement level of students in mathematics learning. The main respondents of this study were five selected students, their parents, mathematics teacher and head teacher of the related school. This chapter includes the analysis and interpretation of the information obtained from the study. The data obtained of the study or presented in terms of following topics personal details of respondents.

#### Analysis of Student's Class Attendance According to School Record

The number of cases school opening days and student's attendance days under grade IX attendance percent from the school record are presented in the following table.

**Table 1: Class Attendance of Students**

**Grade IX (2078)**

S.N	School opening day	Students attendance day	Students attendance percent	Participation Level	Achievement Level of Final Examination
A	186	140	75.27	4	92
B	186	101	57.30	3	85
C	186	129	69.37	4	89
D	186	88	47.31	3	65
E	186	100	53.76	3	72

*Excellent (5) (80-100)%, good (4) (60-80)%, normal (3) (45-60)%, poor (2) (32-45)%, very poor (1) (0-32)%*

The finding recorded in table 1 shows that out of 186 school opening days of grade IX in 2078 the attendance days of selected students A,B,C,D and E have 140, 101, 129, 88, 100, 103 respectively attendance percentage of student. A has 75.27%, B has 54.30%, C has 69.35%, D has 47.31% and E has 53.76%. From the attendance percent of class IX and , research find out participation level of A has 4, which is good, B has 3 which is normal C has 4 which is good, D has 3 which is normal, Ea and F has 3 which is also normal.

### **Analysis of Student's Classroom Interaction According to Grade Room**

#### **Observation**

Five selected students classroom interaction level in the teacher and other students are presented in the following table:

**Table 2: Interaction Position of Students**

<b>S.N</b>	<b>Interaction position with teacher</b>	<b>Interaction position with other students</b>	<b>Participation Level (in average)</b>	<b>Achievement Level of unit test (full mark 10)</b>
A	3	4	3.5	8
B	2	3	2.5	6
C	3	4	3.5	7
D	3	3	3	6
E	2	4	3	5

*Excellent-5, good-4, normal-3, poor-2, very poor-1*

The finding recorded in table 2 shows that interaction level of selected students with teacher are A has 3, which is normal, B has 2 which is poor, C has 3 which is normal, D has 3 which is normal and E has 2 which is poor position.

Interaction level of these students with other students are A has 4 which is good, B has 3 which is normal, C has 4 which is good, D has 3 which is normal and E has 4 which is good. In participation level of average A has 3.5, B has 2.5, C has 3.5, D and E has 3. The result table 2 show that the participation level of A and C was satisfactory and B, D and E were not satisfactory.

#### **Analysis of Students Extra Activities Level (H/W, C/W and C/T)**

Five selected students participation level in extra activities (H/W, C/W and C/T) has presented in following table.

**Table 3: Extra Activities Level of Selected Students**

<b>S.N</b>	<b>H/W (Home work)</b>	<b>C/W (Class work)</b>	<b>C/T (Class test)</b>	<b>Participation Level in average</b>	<b>Achievement Level of final examination</b>
A	4	3	3	3.33	93
B	3	3	3	2	75
C	4	3	4	3.67	96
D	3	2	3	2.67	84
E	4	3	2	3	79

*Excellent-5, good-4, normal-3, poor-2, very poor-1*

In finding recorded is table 3 participation level and achievement level in H/W of selected students are A has 4 which is good, B has 3 which is normal, C has 4 which is good, D has 3 which is normal and E has 4 which is good. The participation and achievement level of C/W of selected students are A, B, C, E have 3 which is normal, D has 2 which is poor. So on participation and achievement level in C/T of selected students are A, B and D have 3 which is normal, C has 4 which is good and E

has 2 which is poor. In average the participation and achievement level of selected students are A has 3.33 which is normal, B has 2 which is poor, C has 3.67 which is good, D has 2.67 normal and E has 3 which is normal.

### **Analysis the Participation in Mathematics of Students According to Interview Paper**

**Respondent A.** Responded A was Sneha Ram 15 year's old girl studing in grade IX. She was born at Bhawanipur V.D.C ward no.2 of Siraha district. Now a day she she lives same place at where she was born. There where 8 members in her family. Her father Bindi Lal Ram and mother Sita Kumari Ram are simple literate. There occupation is farming as well as labouring. In her family she has got two younger brothers and one sister, grandfather, grandmother and parents. Her family used maithali language at home. They do not have to land for farming. She is itrested in her study but due to the lake for her economic condition of family she has to all the house hold work because her father and mother busy to earn money around village area.

About her study her grandfather told;

*"We are dalit, there was no provision of study. So I am illiterate. Because of illiteracy I did not understand about her study. Due to poor economics condition it is very hard for us to arrange the food and clothing. Her father earn some money by doing the some work around the village area. It is very hard to buy her pen and copy etc."*

About the own study respondent A said;

*"Main occupation of my family is farming. I am busy every time in household work, so I could not sufficient time for the mathematics learning at home. I*

*could't understand the mathematics problems and I felt very difficult in learning mathematics."*

For the above view of parents and student I concluded that she had no time to do homework. She was investing maximum time to do household work. Her family members are not educated to give feedback for her further study.

**Respondent B.** Respondent B is Dipesh Mandal of 15 years old boy studying at grade IX. He was born at Dhangadimai Municipality ward no 3 Bhawanipur of Siraha.. There were 4 members in his family. His father Debnarayan Mandal works to labouring and mother is housewife. His economic condition is medium. Parents are manage to the physical facilities that they need . He said

*"I am not interesting to study because I don't understand mathematics I am interesting to drive tractor and working the field."*

When I observed the class he was sitting in back bench and his mind was out of classroom. About his study the mathematics teacher told:

*"He was not interested in the study. He likes to do other work in his mind. He doesn't catch up the class activities. I think he would get good result if he studies regularly and do practice hard."*

He doesn't have good family environment to study. About his father, he told; that

*"We are the people of passing our life by working in daily wages. We have a problem of food and clothing so we can not give attention to his study. The main problem is that we are economically weak"*

These statements conclude that most of the parents are economically and educationally backward, which plays the main role of participation in mathematics classroom.

**Respondent C.** Respondent C was Ritima Chaudhary of 15 years old girl studying in grade IX. She was living with her parents one younger brother and grandmother. She was living at Dhangadimai Municipality ward no. 2 Bhawanipur of Siraha. Her family speak maithali language Her father is Dinesh Chaudhary and mother is Rekha Chaudhary. Their occupation is farming. Her father was literate with SLC passed and mother was literate under SLC. Home environment for learning was not so effective in her family. Her family thinks that daughter must do household works. Her family members believe that, *“Study is important for girl but household work is much more important for girls.”*

After returning from school she got engaged in household works. I asked her about the learning difficulties in mathematics, she said;

*“I don’t have enough time for doing homework and practice the extra problems of mathematics, so I feel difficulty in learning mathematics.”*

According to these views I conclude that the lack of education of parents affects the educational status of their children. The role of teacher in learning process is not sufficient, the parents’ awareness, their education, way of handling and guiding the family members are also most effective factors. If the parents have good education, they try to do their best to enable their children academically. The parents teach the basic knowledge of life, practical aspects, skillful concepts, right vision, appropriate norms and values to their children. So they can live easily in society and inspire them to the right use of life potentiality and opportunity.

**Respondent D.** Sabina Paswan is one of the girl students of Shree Janta Secondary School in Grade IX. She was 16 years old. In her family there were 6 members with one brother, grand parents and parents. She is eldest children of her parents. Her father’s name was Minturaj Paswan and mother Dukhni debi paswan. Her

family speak the Maithali language. Her family engaged in agricultural works. Her family does not have the sufficient land but they farmed in landlords farms. They are very poor so they have difficulties to manage daily life. Her father was skillfull farmer for making handtubel, motor, kodalo etc. Instrument of agriculture. Her mother is housewife. She was illiterate she was laborious in working the field. But she has not awareness about the education of her children. Sabina said she did not like to go to school. I asked with her. "Why you did not interest to go school?"

She said; *"I am always become late due to household works and dominated by other students of my class."*

According to the school attendance register, she seemed to be late but presented except special conditions. There were no any opportunities provided by school to her. Nepal government providing special scholarship for the Dalit students which help her to manage the stationeries. About the difficulties of learning mathematics, Sabina told:

*"There are so many difficulties in learning mathematics. I have got more difficulties in geometry, menstruation and arithmetic."* This is because of lack of study time, poor economic condition, friendship of bad society etc.

About this argue teacher is passive in teaching learning process. He always use tradition method to teaching.

**Respondent E.** Roshan Chaudhary is a 15 years old boy students. His house is located at Bhawanipur , Siraha and it take 10 minutes to go to the school. There are 4 members in his family and they all followed Hindu religion. His father is labour in work in other field works. His mother is seemed busy in household work as a house wife. Social is his favourite subject. His hobby is to play volleyball and his aim in life is to be good volleyball player. H e is known as a good student of the class but the

teacher said; *“He is restless he has talked in the class while the teacher is teaching. He usually ask the question to the teacher unhesitating when he faced the problem.”*

While observing the mathematics class, I have shown that he has always presented his homework and immediately solved the mathematics problem which the teacher worked out in the class work. He has one friend in the classroom with whom he used to sit and outside the school too. He has passed his time with the same friend. He seem satisfied with the school environment. He always respect teacher and staff of school because he thought that they has provided the opportunity to get equal education to all thought that knowledge of mathematics should be applied to the daily life. So, he is interest in mathematical learning he passes his most of the hours to the mathematical problem than the other subjects. He is interested in magical problem from out of the course. The parents his, the best students is intelligent in mathematics because of his good home environment he could succeed in mathematics

#### **Major Factors Affecting the Participation of Students in Mathematics Learning**

Factors that discourage the students from learning mathematics can be related to school environment or their home environment. Anxiety about learning mathematics can be due to students bad experience from previous school, lack of teachers consideration for students family environment. Very often children watch their parents struggling with unpaid bills, unforeseen debts and many other problems. As a result, young people start to associate mathematics with pain and frustration and don't try to learn it. Many of them remain convinced that mathematics is some thing unpleasant and should be avoided throughout their whole lives. In their adult lives they miss professional and personal opportunities because they perform poorly in mathematics. Another reason for students aversion towards mathematics is their inability to connected mathematics concepts with their daily life.

According to mathematics teacher;

*“Mathematics education requires highly motivated students because it requires reasoning, making interpretation and solving problems, mathematical issues and concepts. The challenges of mathematics learning for today’s education are that it requires disciplined study, concentration and motivation. To meet these challenges, learners must be focused and motivated to progress.”*

Supporting these views, the head teacher says;

*“The teachers role in students motivation should not be underestimated for helping students to become motivated learners and obtain the mathematical knowledge successfully. The teacher’s main instructional task is to create a learning environment where students can engage in mathematical thinking activities and see mathematics as something requiring exploration, conjecture, representation, generalization, varification and reflection.”*

Today’s students strongly need to know the uses of mathematics that taught in their practical life. They could not see any connection of their lives with different part of mathematics such as geometry, trigonometry and algebra. This is due to the fact that the process of information and their motivation for learning does not correspond with traditional method of classroom teaching. According to mathematical abstract, lecture method is still commonly used to teach mathematics. They are supposed to look for those connections on their own outside the classroom. However, nowadays students desperately need to understand how mathematical concepts will relate to

their working place as well as their society. And if they do not see any reason why they have to learn a topic, they lose motivation and their future, professional lives.

Every teacher should be capable to teach the subject matter effectively. But most of the teachers in school level are untrained with low qualification. Parents negligence plays the favorable role to reduce the children's self-confidence. Weak relationship between teachers and students destroyed the creativity, which must be realized. Many students who are weak in study are interested to sit with weak students and it is difficult to create the learning environment. They copy the guide and talent students note for doing homework but do not devote time for thinking seriously. Ultimately, they hate mathematics. They do not know about application and utility within and outside, national and international perspective. School environment is directly related to the effective learning. School environment need to maintain suitably according to the philosophy of learning, if not the learning program will be technically paralyzed. Most of the schools are unable to maintain the effective learning opportunity.

Negative attitude of parents toward the, children their affects their study and tending to narrow minded. Parents have some duties to perform for school. The role of parents is not only to send their children to the school but also to check reliable situation that their children are going to right way or not. Most of the people in Nepal still lie below the poverty boarder line. They do not able to fulfill their basic needs and their capacity the poor children become servent for rich family.They do not get the opportunity to study. Such conditions play the vital role to the educational achievement.

With the help of related literature, theory, interview with students, their parents, mathematics teacher, head teacher, observation and related documents of

school it was assumed that there were different factor at teaching the participation achievement students in mathematics . Such variable are described separately as follows:

**Teaching/learning process.** Teaching is the process of learning in mathematics classroom. It is a science and art of providing and gaining knowledge via different method. It includes the method of teaching, process of motivation, opportunity to learn in classroom activities.

In the observation school, the parent researcher had tried to know the teaching method used by teachers in mathematics classroom, learning opportunity in school and interest of the learner while learning. This study focuses these things with learners. The mathematical problem can be solved by different process in mathematics. The teachers directly effects on the mathematics learning of students. It is better to use student centered approach the teacher centered approach while teaching mathematics.

Many theories about the learning and development of children to analyzed and find the situation in the area of low participation in mathematics; constructivism becomes one of the possible theory to solve the problem on the topic of "Participation and Achievement level of Mathematics in Secondary Level Mathematics." Every students learns from social contact with home, family and universe. According to them, knowledge can be constructed from society. I analyzed suitable solution in the class of low participation in mathematics.

When I asked with the students the question "How is your interest in mathematics?" Most of the respondents had taken subjects a most difficult subject in comparison with the other subject which the curriculum includes. The responses to the questions were following:

*“It is difficult to study so I do not like mathematics.”*

*(Student)*

*“It is not difficult to learn mathematics if I take class regular.”*

*(Student)*

*“Mathematics is interesting I could not give time at home so it is difficult.”*

*(Student)*

From the above responses it could be said that most of them feel mathematics difficult. They are not interested mathematics. The main cause of their responses is taken as a method used by teachers while teaching learning activities in classroom. When I tried to know the method of teaching of the teachers, the responses from the respondent teachers were as follows;

*“I use student centered method as well as explain the problem step by step on the background while teaching mathematics. But I prefer to use problem solving methods most. If necessary I use teaching materials.” (Views of Math Teacher)*

The above views indicated that the teacher used problem solving methods but explaining step by step. It was also observed that teacher used different teaching methods as relevant to the topics. The teacher also used teaching materials as necessary for the lesson. Hence, it was concluded that teaching method in the classroom was satisfactory from the response of the respondents.

It is a theory based on observation and scientific study to deal the problem of learning. It asserts on forming the understanding and knowledge of the world through experiencing things. I observed the theory constructivism transform the students from passive receipting of information to active participation in teaching process. This theory focus real life learning environment, social interaction and use of complex idea

share with other outside of classroom early. It encourage the students involve themselves actively and use techniques of learners centered. Group work, discussion, learning by doing use outside tools to be more practical.

The observation and interview taken from students and teacher, it was found the most of the students used to absent in class. So., it carried out problems in teaching learning process which were problem to finish the course in time problems to be selected and to be used appropriate method and materials, teacher plan was failed but the teacher had tried to apply the interaction, problem solving method and student centered method according to Vygotsky social development theory of students participation.

When researcher asked the question “What do you think the teachers behaviour towards you?” The responses to this question were as follows:

*“Teacher behaves equally in the class” (Student)*

*“They do not discriminate in the class. But they do not give the special attention to us.” (Student)*

*“If we ask the teachers they give us positive response” (Student)*

*“Teacher does not give the special attention to us” (Student)*

According to the response it could be used that teacher does not discriminate them. Teacher behaves equally in the classroom. From the above discussion, I found that the poverty of the family, peer, school environment, the interest of the learner, processes of motivation used by teacher while teaching learning activities, and other issues were the major factors which creates the difficulties in participation in mathematics classes. Due to the lack of educational awareness the parents couldn't maintain the home environment to study for students. They want that their children should help in their work at home.

**Parental education and economic status.** Home is the first school for the children and mother is the first teacher of the children and father, elder brothers and sisters are transferring the knowledge to the child. If the parents are literate and have good moral and character then their children also imitated the same behaviour. If parents have bad behaviour and are illiterate, their children learn that behaviour from parents, elder brothers and sisters. Hence, the poor parent education is another factor affecting the participation in mathematics. In this regards, Respondent C said that;

*“My parents are simply literate. They always engage in household work. I have to help my parents. So, I can’t take effort about my education. My mother spends almost time to making domestic materials. Grandfather and grandmother are sick and too old. They do not know the value of education. So I have no guidance at home and there is no separate room to read peacefully at home.”*

The above view shows that most of the parents are illiterate. Parents’ educational level has been most effective factor in academic achievement. Parents serve as a role model and a guide in encouraging their children to pursue high educational goals and desires. By establishing the educational resources on hand in the home and holding particular attitudes and values towards their children’s learning. Researcher asked to a respondent about her families’ economic and academic condition, she said; *“Our economic condition is very poor. There is no other than my father or earning money. It is difficult to afford the educational expenses. In family there was no well-educated person that would help in my mathematics learning.”* The number of studies indicated that the student’s achievement is correlated highly with the educational attainment of parents. For instance, students whose parents had less it

high school education obtained lower grade in mathematics than those whose parents had higher level of education.

**Home environment.** Home is the first school to every individual. The students spend most of the time in the house. The children learn many things from their parents.

The response to the question “How does work load affect your learning?” is as follows:

*“I have to help my parents in the home; I could not be regular in the class.”*

*(Student)*

*“I have to help in the work at home. I could not give time to my study. So, I do not participate in mathematics period.”* *(Student)*

*“I work at home and also regular in the school but I could not give more time at home.”* *(Student)*

On the basis of the above response it can be said that the work load in the home hamper their study. They have to be irregular in the school because of the work at home. They could not give enough time for mathematics practice at home. So, they do not participation mathematics period.

The parents were asked some question by the researcher when the parents were asked about “What do they think about the education of their children.” The following responses were obtained.

*“I could not participate them; it is difficult to pay for their education so I think they do not go school and work at home with us for daily life.”* *(Parents)*

*“Nowadays everyone is educated so they have to go to study for good life.”*

*(Parents)*

*“It is difficult to live without education but it is difficult to pay for their education.” (Parents)*

From the above response it can be said that most of the parents are aware for their children’s education. They think education makes life easy.

The responses the question “How does the home environment affect your study were as following:

*“The members in the home do not understand that we have to study in home also. They talk loudly. So, we could not concentrate our mind. There is no person to help us.” (Students)*

*“There are too many members in the home they carry and quarrel. It is difficult to study at home. We could not see anyone studying in the home so we do not think we have to study.” (Students)*

From the above response it is found that there is not environment to study for students in the home. They could not practice mathematics problem at home. They have to peaceful room to study. There is crowd and quirellism environment in the home.

From the observation and interview taken from students, parents it was found that most of the selected students were very poor economically culturally and educationally. Parents couldn’t regard their child education because of hard labor in participate and house of upper caste. So, they couldn't give time for their child’s. They can’t provide learning opportunity in home but they didn’t base on the basis of son and daughter.

**School environment.** The school environment play the important role to decide the future position of the students and the life of students. The teaching activities and extra-curricular activities conducted in the school come within the

school environment. There should be rule and regulation followed by the teacher and students in the school student should be regular in the school for the good achievement. Discipline of the students is also responsible for the good learning. There should be good relationship between teacher, students, headmaster, parents and school administration but students are not so close to the teacher and headmaster of the school students do not be close to the teacher but other student close to the teacher. The school is compound with surrounding the wall. It makes the school environment safe from the outside noise and unnecessary contact with people. The school is about near the small market but so for the village. The school environment is peaceful. There is no disturbance on the study of the students. Generally students and teachers have to come in time in the school.

In educational field there are libraries, game compound of the school, toilet, blocks, and drinking water only the text book and teachers are the sources of knowledge for the students. Buildings are sufficient and toilet facility is good. Drinking water is sufficient in the school. The school compound is large. The school conducts different extra-curricular activities such as quizzes, discussion and dance program game mainly football and volley ball. Library is the important organ of the educational institute to promote the students education. To improve on the achievement and to empower the mind of the student library should be compulsory in each school. The school had average physical environment there were sufficient playground tap of water and school was situated in peace environment, which had supported to the students in learning. School used to conduct extra-curricular activities such as mental or educational and physical activities. Students interested to participate in the physical activities but they were not interested to participate in the educational activities. Such as quiz context, discussion, essay

competition etc.

**Culture based pedagogy.** Culture is the way in which a group of people make meaning of their experience through language, beliefs, social practices and the use and creation of materials objects (Bank,2006; as cited in Acharya, 2072). Teaching mathematics requires addressing diversity it is need for the people of different culture. Culture based education is the grounding of instruction and student learning in the values, norms, knowledge, beliefs, practices and language that the foundation of a culture. Culturally responsive teaching has defined as an approach to teaching uses student's culture knowledge as a conduit to facilitate the teaching learning forces ( Ladson-Billing, The Dreamkeepers, 1994) Villegas and Lucas, 2002 as cited in Ukpokodu, 2011).

Teachers most incorporate a variety of teaching strategies that appeal to and consider all of the learners in their classroom. Students who were not of dominant culture have suffered because they have not given a fair opportunity to adopt the norms of the classroom. In this perspective my respondent teacher shared his views as;

*My long experience as a teacher that teacher need to be familiar with students. We need to be like, a friend with students in teaching learning activities, and we have to share our culture perspective , also we need to know students culture and social background. When we teach by knowing students culture background then students can do their problem easily. For this, teacher needs to provide server example relevant culture and social norms.*

From the above views of mathematics teacher, it claimed that for making mathematics students friendly, we have to teach our class intresting based on students daily life activities sharing their culture and social norms in our process.. All students

are come from different culture and different society so they have own culture and social values, norms, learning experiences and knowledge that ensure that they will understand mathematics teacher can use teaching-learning strategy that a culture and enculturation of the student in their classroom teaching learning process. In this regard, Acharya (2021) Suggest that teaching in mother language, contextualize ethno mathematics and local knowledge in curriculum were the basic indicator for mathematics culturally relevance.

Culturally relevant pedagogy is an effective instruction, practice and theoretical that promotes students achievement, supports students, cultural identity and helps students to develop the critical perspectives needed to challenge inequalities in school a society (Ladson- Billings, Culturally relevant teaching, 1995) as cited in (Terry and Irving, 2010).

In the context of Nepalese school, there are lack of using different strategies in teaching mathematics was found. Most of the mathematics teacher uses teacher-centered method I.e. traditional lecture method, rote learning these methods are easy for teacher but students enable to understand and do response. In this regard my participant second mathematics teacher said;

Teaching is most effective when the teacher and learner have a friendly relationship. The foundation of a friendly relationship built as teachers take time to learn about students interest, culture and experiences. That helps teachers to use different strategies according to the interest and experience students. In addition, that helps to creating student friendly.

From the above information of school mathematics teachers have found that while conducting the classroom participate and achievement level of mathematics. Teacher may try to create their own mathematics classroom practice based on the

students need and experience in mathematics teaching. While students have the different ability of learning styles, so the teacher should be use different students-centered teaching learning methods like group work, roll playing and game methods in mathematics teaching.

**Interest of learner.** Student interest in a topic holds so much power. Factoring for student interests works well with instruction planning based on readiness and learning profiles. One example is student watching videos, listening to speakers, and journaling to make comparisons between social injustices from the past and forms a bullying that occur in today's schools and communities.

First step to differentiate for interests is to find out what students care about and like to do students surveys and learning profile cards are two method for collecting data. Parents and students providing these details send the message that their experiences matter. That is powerful message to start off the school year or semester.

Interest is associated with the success and failure of life and achievement . Here interest of learner indicates the willingness of students toward subject, behaving with optional mathematics. Researcher has asked the question and noted them in their respected voices as below:

"We try to make the classroom effectively learning environment. Talent students are interested towards their study but poor students are not focused to their study." (Math teacher)

"Interest of learner plays vital role in learning. So make the classroom effective. But most of the students are not interest in their study because of their home environment." (Head teacher)

"They are not interested in their study. They go to bed fast not get up in the morning. They are out of our control." (Parents)

"Class books are not tied up with junior graded books. It is haphazardly edited and formulated. Exercises are not proper. We are not interested to solve because we don't understand teaching." (Students)

I found from the above statements that interest of learner is the essential part of learning. It helps to gain knowledge. It depends on the competency of students. Talented students are focused to their learning but poor students neglect study.

Above observing we found that there was not extra time to students from teacher side. Students only finish their homework but they did not work seriously and practice extra exercises. There were not motivating activities to students. Students were not curious to solve homework. They were coping from talented students.

*Episode first.* It was my first class observation day. I can research my sample school Shree Janata Secondary school at Bhawanipur-2 Siraha. I researched that school by 10:30am. First, I met the head teacher of the school who welcomed me tenderly. The head teacher arranged for me necessary classes for the observation after having a short information about the main purpose of my visit. I got class IX section A with mathematics subject teacher. It was second period of 45 minutes duration. The subject teacher had 7 years of teaching experience. He master degree with mathematics major.

*The classroom was quite big and rectangular. There was about 35 students in the co-educational class; math teacher entered the class and what he was going to teach that day, taken from the textbook, the topic was circle. First he asked for students about circle, some of them had answered themselves. He defined about chord, diameter, radius sector and semi-circle etc. He was using*

*lecture method mostly. The classroom was little a bit noisily and students were talking each other. He did not use any kinds of materials of circle. He was just telling about characteristics of circle orally. After describing about lesson, he said to students for read the book. After that time finished then we want out*

The above class observation shows that the teacher started his class with specific objectives. The teacher tried to motive the students to learn mathematics subject matter that means the teacher followed the preparatory phase and introductory phase. The teacher was elaborates the topic, provides examples for concept clear, gives encouragement, response to the students are radius the confusion. But the teacher did not use any teaching materials in the classroom teaching and the interactive phase was not follow satisfactory, teacher recapitulates the lesson as summary, give instruction to the students but he not do systematically.

After finished the classroom observation, I asked my teacher participation "Do you have prepared written lesson plan before entering the class?" The teacher said,

Actually, being a trained teacher, before taking class I should prepare lesson plan but I did not prepare it in written way instead that I roughly prepare objectives and activities.

This means that teacher was theoretically well known to prepare the lesson plan before enter the classroom but practically he was unable to practice in actual classroom teaching.

*Second episode.* It was my second class observation day. I can research my sample school Shree Janata Secondary school at Bhawanipur-2 Siraha. I research that school by 12:00am. I got class IX section B with mathematics subject teacher. There were 40 students in the class. The class was well managed. The white board was placed on the right place all of the present students were in the classroom.

Mathematics teacher enter the class all the students stood and said good afternoon sir, the teacher replied good afternoon class and tell "how are you?" all the students said in love voice "fine sir" then teacher said sit down. Teacher started to teach the topic "Volume of Cylinder".

The teacher wrote the topic, Menstruation and Volume of Cylinder after that told to turn yesterday's homework. He asked for students about unsolved problem then he did one problem on whiteboard and explain about length, breath and height. After that he told to the students for do problem on their copy. He was using lecture and discussion method.. At last, the teachers summarized verbally the whole lesson of the day then, gave some problem as homework and went out

From the above classroom observation, it was found that the teacher motivated the students to learn. In addition, the teacher gave opportunities to do solve the problem themselves as well as evaluate the students work.

*Episode third.* It was my third class observation day. I can research my sample school. It was my third classroom observation. My observation class was class IX section A. The main purpose to observe the classroom was how to deliver the subject matter to the students. That day teacher taught the students on the topic height and distance.

*Teaching topic and objective were clear and specific. He frequents encourage the students for solving the mathematical problems. He was confident his teaching concepts. He evaluated the students after finished the class by giving some problems of height and distance then summarized the lesson.*

From the above classroom observation, I found that teacher was well prepared about teaching subject matter. I found that the teacher evaluated the students appropriately. Furthermore, it claims that the teacher concluded the lesson.

*Episode fourth.* It was my fourth class observation day. I can research my sample school. My observation class was class IX section B. The main purpose to observe the classroom was how the mathematics teacher and dalit student interact each other.

*“The mathematics teacher was just entered in the class together with researcher by carrying daily use teaching materials. He had started to teach. He wrote the topic LCM. He did not review the previous lesson. The teacher wrote the question on blackboard and found the LCM by himself. Then, one of the researchers” respondent asked the question about factorization with the teacher, but he was angry and said, did you present yesterday? The student was quite serious and told “No sir.” Again teacher solving another question by himself. Teacher asked some question with other students but Dalit student did not get such opportunity at class. They were sitting at last benches and seemed to be a silent. The teacher gave homework form exercise and the class was over.”*

From above classroom activities it indicated that there is no proper interaction between teacher and Dalit students in mathematics. Teacher does not response to the Dalit students. Teacher always dominates the Dalit students because they were not did mathematics homework regularly and they mostly became absent in school. Interaction brings the maturity in learning. But the interaction between Dalit students and teachers could not be seen in the class nicely. It is due to their socio-cultural discontinuity. At last it can be conclude that the interaction is another factor which creates the participation in mathematics for Dalit students.

## Chapter V

### FINDINGS, CONCLUSION AND IMPLICATIONS

This chapter is basically concerned in deriving some findings and conclusions from the discussion of the previous chapter. Besides findings and conclusion, it has some implication which will be woeful for further studies and education implication.

#### Findings

The major findings of my study were:

- ) The presence of selected students in their classwork, class test and homework is found to be less.
- ) Teacher were capable in academically but they were not using modern teaching methods. They were teaching traditionally. Some younger teacher were using modern teaching methods.
- ) There was not group coordination between and among students. Some students felt themselves superior some other were poor. Students were not regular in classroom.
- ) Teacher provided homework to the students. But teacher did not check regularly.
- ) Home environment was not good. They had not separate room to study. They had poor economical background. They used to help their parents in their field. So they could not get proper time to study in their home. Most of the parents were engaged in agriculture.
- ) Unit test and Class test were not running according to rules and regulation. Management committee will not look after any exam to began regularly as not.
- ) Students were not interested in mathematics subject. There was traditional teaching strategy therefore students felt bore in their study.

- ) The Factors Affecting the Participation Students in Mathematics Learning
- ) Teaching learning process
- ) Parental education and economic status
- ) Home environment
- ) School environment
- ) Culture based pedagogy
- ) Interest of Learner

### **Conclusions**

The following conclusion have been made by this research work. Unit test and class test is done according to teacher interest. It is not concluded according to the rules and regulations of school. Management committee will not look after any exam to be taken regularity as not. Students are not regular in classroom. They are absent no regularity of the students attendance. The main occupation of parents is agriculture. Thus, it is difficult to earn only therefore their income is used for their basic needs. Parents do not have extra money to pay for extra class.

The teacher is not follow the required teaching methods. The teaching materials were not well prepared or used in classroom. The environment of classroom were effected the economical condition of the school. Due to the poverty there were many lack of facilities. The teacher, students, parents must join hands together to uplift the educational system. The school must provide refresh training to the teacher time and again. Lake of teaching materials and adequate instructional materials were caused of being weak in mathematics learn in school must manage new policies for improvement of teaching process.

There are the main factors which are affecting in learning mathematics participation and achievement in secondary level students. It was concluded that

present situation of participation of students in mathematics subject for making classroom student centred, culture and mathematics has mutual relation. For making classroom participation achievement level is high then applying culture based pedagogy, using different strategies in teaching learning, using modern teaching method, make physical availability at school, using multiple representation. Therefore, our classroom participation and achievement level of students focus in this direction.

### **Implication**

From the above findings and conclusions, the researcher would like to suggest some implication for the improvement of mathematics learning of the mathematics.

In the context of Nepal, many students have low learning in mathematics and the trend is still continuing. Only the researcher has researched about factors which effect learning. Although qualified, trained and experiences teachers are working at public schools. Continuous assessment system, implementation of operational mechanism and its continuous analysis, a change from syllabus focused to students outcomes as well as a move from teacher directed classroom to students centered learning is necessary to maintain quality education at school.

This was the case of one school so the results cannot be generalized an all situations. It is due to lack of time and resources. Thus, similar researches should be done in large schools .Government should researcher about this problem. Government and policies maker should make good mechanisms so that school can adopt to promote mathematics learning.

**Implications for the further study.** The research is based on the participation and achievement level of mathematics in secondary level students. Therefore, it is useful to theoretical implementation. Which presented as below:-

- This study conducted using small sample thus the study could not generalized in the broad sense. Thus, it more valuable in the study would be done with covering broad areas.
- This research opened the door for more researchers to study the culturally diverse students and their classroom interaction in mathematics subject with teachers and friends.
- This research also is helpful to make classroom interesting and effective students culture friendly.
- This report could be good learning resource for students, teachers and researchers as well.

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## Appendices

### APPENDIX 'A'

#### Class Observation Form

The classroom observation form prepared on the basis of following indicators being participation with mathematics teacher during teaching learning activities.

**Teacher's Name:**

**Topic:**

**Grade:**

**No. of students:**

1. Physical environment of the classroom.
2. Teaching learning activities.
  - i. Beginning of the class
    - Creates and maintains a physical setting that promotes learning.
  - ii. Setting the stage for learning.

Communicates objectives appropriately.

    - Reviews and relates new learning to previous learning.
    - Raises level of interest in the lesson.
  - iii. Acquisition of learning
    - Combines auditory explanation with visual references and student involvement.
    - Checks students understanding of objectives.
    - Provides guided for practice.
    - Encourages relevant discussion.
    - Utilizes flexible grouping for practices.
    - Uses a variety of strategies such as discussion, cooperative, project work, classwork.

- Communicates the methods of the interesting the ability of thinking topic, formulae, etc.
- Utilized questioning techniques.
- Provides independent practice..

iv. Integration of teaching materials

- Applies the materials truth.
- Sources of the teaching materials: hand made, local or bought.
- Student's attractive materials.

V. Closure of lesson

- Relates lesson to objectives.
- Allows for student involvement.
- Reviews the learning of the day to set the stage for next learning.
- Check the understanding of students.
- Encourage students to reflect on and take responsibility for their learning.
- Provides assignments, homework, project work relevant to the learning that has been practiced with guidance.

## **Appendix 'B'**

### **Guideline for Interview with Head teacher**

The interview with head teacher took on the basis of following topics.

**Name:**

**Qualification:**

**Teaching Experience:**

- School facilities:
  
- Classroom management:
  
- Relation with parents/guardians:
  
- Opinion towards mathematics learning in classroom:
  
- Opinion towards low learning in classroom:
  
- Policies for low learning in classroom.

## **Appendix 'C'**

### **Guidelines for interview with Mathematics Teacher**

The interview with mathematics teacher took on the basis of following topic.

**Name:**

**Qualification:**

**Teaching Experience:**

- School facilities:
- Classroom management:
- Relation with parents/guardians:
- Opinion towards mathematics learning in classroom:
- Opinion towards low learning in classroom:

## **Appendix 'D'**

### **Guidelines for Interview with Students**

**Name:**

**Roll No.:**

**Sex:**

**Place of Residence:**

- Opinion on facilities of the school:
- Opinion towards mathematics teaching and learning:
- Opinion towards mathematics learning in classroom:
- Opinion towards mathematics teacher:
- Classroom practice:
- Opinion towards causes of low learning classroom:
- Opinion towards school policy for low learning in classroom:

## **Appendix 'E'**

### **Guidelines for Interview with Parents/Guardians**

**Name:**

**Sex:**

**Qualification:**

**Family Size:**

**Annual Income:**

**Teaching Experience:**

- Opinion towards child educational learning:
- Activities of the child home:
- Opinion towards schools facilities and policies:
- Relation among school staff:
- Role at school:

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