Chapter-I

INTRODUCTION

Background of the Study

Participation plays the vital role in mathematics learning and its achievement so; Dalit students are needed to be participated actively for their mathematics learning. Mathematics Education is the foundation of human civilization. So it has become possible to bring of this civilization up to this stage from the barbaric stage. Education, in its sense, aims to transfer the ideas,skills,attitudes, experience and knowledge of people in the community. Mathematics education plays a significant role for the overall development of the citizens and country. With the mathematics education system, so many disciplines have the vital role.

Mathematics learning is the compulsory need of the human life. So mathematics learning is necessary. So that students need actively participate to achieve the mathematical knowledge and concepts. According to PSSMS's (Principal standards for school mathematics) learning principal, "Student must learn mathematics with understanding, actively building new knowledge experience and prior knowledge". (NCTM; 2000, Upadhyay; 2061 B. S)

We gain the education through participated in the learning process. According to the American Heritage Dictionary, Learning is to gain knowledge, comprehension or mastery through experience or study (Bower et.al 1986). According to (Mussen et.al 1969), learning is a process by which behavior or personality for behavior is modified as a result of experience. According to him, learning represents the establishment of new relationship bounds or connection between units that was not previously associated." Learning leads an innocent child to the experienced child. Child learns to live in her / his family and then in society. As she /he gradually becomes older and

comes in contact with several experiences or skills from her/his family and environment that help to socialize in the society" (Sigdel,2004).

Mathematics education plays an important role for the development of science and technology as well as every human discipline. 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 people not only in the modern age. The mathematics has been utilized it 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 mathematics. But now, the empirical (practical) mathematics has been developed into abstract mathematics theory. "Oriental literature reveals that mathematics was originated from practical experiences". (Eves, 1981, p.22). Without having the knowledge of mathematics now, it is very difficult to understand other disciplines such as, chemistry, physics, social sciences, economics etc. Thus, mathematics is intimately involved in every moment of everyone's life and every disciplines of human civilization. It is accepted as the heritage of human civilization.

- **Socio-Cultural Status of Nepal**

Several types of diversities are existed in Nepal. Geographically, it is divided into three regions: mountain, hill and terai regions. The life style of people differs according to the different ecological belts. Nepal is a multilingual, multiethnic and

multicultural country. The remarkable numbers of the followers of the religions such as Hindu, Buddhism, Muslim, Christianity and other different religious beliefs are also living in the country that co-exist with harmony and religious tolerance. Based on the criteria of the division of labor and craft specialization, the Lichhavi for the first time reinforced a stratified caste system among the Hindu of Kathmandu valley, which has been deeply rooted in the Nepalese society at present also. The division of the caste system was highly influenced by the grade wise Varna model of Hindu system illustrated in the code of Manuscript that categorize people into four major castes as Brahman, Kshatriya , Vaishya and Sudra (Bista,1990,p.43).

Forcing their academic and security functions, the first two castes were considered as the upper caste people. Those people who have the job of ritual priest with a ritual purity were called as Brahmans. Similarly the people who were working as administrators and ruling bodies were considered as Kshatriya. The people who were qualified were Vaishya and those people who were actually working people with different trades and craft specialization were considered as Sudra. The trade people and craft specialization people such as Damai(tailors), Dhobi(washer people), Sarki(cobblers tanners and shoemakers), Kami(black smith/iron tool makers), Badi, Gaine(beg; by singing and dancing) and other like people were classified as Sudra who during the post Vedic period were also considered as untouchable and impure for upper caste people.

King Prithvi Narayan Shah, the founder king of modern Nepal also accepted the caste stratification in the society by announcing "Nepal as the garden of four Varna and thirty- six castes" Since caste groups form and deform because of marriage, there might be the possibilities that were thirty six caste people only through it was the reality of the society, it helped to broaden up the ditch of caste hierarchy by making

people aware of their castes, functions and limitations in the society which were allocated by the previous rulers through the codes of conducts. Similarly in the 19[th]century, the first Prime minister, JangaBahadurRana after taking over the power of the country tried to make the caste system strong by providing legal functions on it. This main interest was to raise his own status to the highest possible level so that he and his successors could rule the country for a long period of the time by establishing the legitimacy of the Ranas over the resources, power and the country (Bista; 1990).

This caste system was initiated in order to fulfill the interest of the dominant high caste group of people particularly, Brahmans and Kshatriya by legitimizing their upper caste position in the Nepalese society. The lower caste people termed as Sudra did not get any opportunity and advantage in becoming a part of caste system except accepting the position of untouchables that made disadvantaged forever. Its continuation is still prevailing in the society at present also whether it is declared illegal by law in the country (HMG/Nepal, 1999, 2000, 2002). Since the time immemorial, these lower caste people are being discriminated, humiliated and disadvantaged socially, economically, culturally and politically in the society by the upper caste people and the state in the name of untouchable and impurity to so-called upper caste people (Bista; 1990).

- **Dalit Composition in Nepal**

According to a Nepali dictionary called 'Brihat Nepali Shabdakosh' states that the term Dalit as "Caste or group of people who are unable to get equal right, prestige and power in the society; exploited and disadvantaged caste or group of people due to unequal social system."

CERID (1996) has used the terms 'caste' and 'ethnic group' synonymously in regards to educationally disadvantaged group identification. 'Oxford Advanced learners Dictionary' defines that the word ethnic as (a) involving a nation, race or tribe that has a common culture traditions; ethnic minorities/groups/communities. (b) Of a person belonging to the specified country or area birth of family history rather than nationality.

"Even five fingers of a hand are not equal how can an individual be equal, how can and with these words, does a Nepali legitimize social inequality by drawing upon a folk formula to explain it? Contrary to this legitimization of inequality, he or she also argues that to the god all human beings are equal. This is expressed the lived tension of being socially equal or unequal, a tension which is manifested in many different forms. Nepal's religious and cultural value, that some are born high caste and some low caste and socio-economic values that some are born with a silver spoon in their mouth and other with a hand to mouth problems for mammal sustenance, maintains and reproduces the tension of being equal or being unequal. The caste system in Nepal was conceived and natured by religious and cultural values, and in the most castes a grade system blended with the caste hierarchy. In both the advantaged and disadvantaged caste, there is word karma (action or fate) to legitimize this inequality. The affluent high caste the same word karma now implying socially and religiously unacceptable actions translates into fat echoing poverty, negativity, passivity and eventually untouchability"(Koirala, 1996)

Thus, the definitions of Nepali word 'Dalit' shows that it can be used synonymously for disadvantage. In short, 'Dalit' for this study is defined as the caste or group of people, who are socially, culturally, economically and politically exploited, discriminated and disadvantaged in the society due to unequal social system.

In other words, 'Dalit' is considered as politically voiceless which is prestige is socially less, economically exploited and psychologically dominated person or caste or group of people in the society. Because of the unequal social system they are considered as untouchable and water unacceptable people by the people who believe in caste system that helps establishing their legitimacy overstates power and resource.

Dalit are Scattered everywhere in Nepal. According to census of 2001, the total population of Nepal was 2, 31, 51,423.The population of Dalit was 29, 45,223 which is 12.85% of the total population of Nepal. According to the report "Poverty in Nepal" 2066/67 of CBS, the population of Dalit in Nepal is 13.3%. According to the census of 2011, the total population of Nepal is 2, 66, 20;809.In whichthe population of Dalit is almost 15% of the total population of Nepal. They are settled in mountains, capital city inner terai and terai regions of Nepal. to name some of them are Damai, kami, Sarki and Gaine in the mountain and hilly region; pode, kasain, cheldar, chime and Badi in Kathamdu, the capital city and Dum, Dhobi, Lohar, Musahar, Dushad, Kalwar, Chammar, Kushwa,Tamata and Kudke in inner terai and terai region.

Dalit is onedisadvantaged communityamong the many disadvantaged communities of Nepal.Dalit communityand its caste and sub-caste system are also multilingual. These Dalits are settled in all 75 districts of Nepal and are known as water taboo caste (Paninachalne) or untouchable (Achhut). There are both the paninchalne and achhut group in Nepal. Achhutisa synonym of paninachalne groups. Kami,Damai, Sarki, Badi, Gaine, Sunar and many other castes belonging to this group of people. These castes, in the past were made on the basis of the function (work) they carried out. Based on Hindu mythology, these Dalits belongs to the Sudra groups of the Hindu's varnashramsystem. Looking back to the history of the Dalits in Nepal, these people are worker grade people. Initially, accusation only was the basis of caste system.

But after on the basis was not followed these occupational groups of people got socially stylized as hereditarily being born as Dalit, living as Dalit and dying as Dalit, Thus the Dalits became an exclusive caste group.

Most of the Dalit people are very poor. Their socio-economic status also less than other upper caste people.Some people have followed the caste specific traditional occupation to establish in the society and some followed agricultural field. These occupational skills contribute a little improvement of their life style. One of the reasons of being poor is that they have large number of children, because of lack of education. They give birth to a large number of children. So, the educated parents take care of their child seriously rather than the literate and illiterate parents. Educationally, the Dalit people are still backward. Only a few people are educated in this community. So, most people are economically poor and they cannot send their children in school.

Statement of the Problem

Out of twenty-six millionpeople, there are 125 different castes ethnic groups; Dalit is one of the dominated communities of Nepal. In general, most of them are settled in rural areas because of their poverty. Many research shows that their educational achievement is not satisfactory. It is also true in mathematics. Therefore, the researcher interested to find status of mathematical knowledge of Dalit children by obtaining participation inlearning activities and achievement in mathematics.

In general, it can be seen that mathematics is an essential part of one's daily life. In the official works or household 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 concept.

So, children also need mathematical concept for performing their daily tasks who do not go to school for gaining formal education. Such people's pupil can be categorized into 3 parts such as, some learn mathematics formally, some informally and also some non-formally. Despite this fact, those pupils who learn formally so, can be seen to be fragmented into Dalit and non-Dalit students and comparatively, we can see that Dalit students are more backward in education which is also true in mathematics. So wanting to know the real fact about their actual level in mathematics, the research took up this research project along with the following research questions:

- What is the status of participation of Dalit students in mathematics learning?

- What is the relationship between participation level inmathematics learning and achievementin mathematicsof Dalit students?

- What is therole of participation in mathematics learning for mathematics achievement ofDalit students?

Objectives of the Study

The purpose of the study is to determine the relationship between participation and achievement in mathematics of Dalit students. So the specific objectives of the research are as follows.

- To identify the participationof Dalit students in mathematics learning.
- To analyze the relation of mathematics achievement of Dalit students with respect toparticipation in mathematics learning.

Significance of the Study

For thesake of the better life everyone should study mathematics and gain better achievement. For the better achievement there should be positive attitude form every

aspect towards mathematics and should be participate in learning mathematics through the willing. Legally, there are not any barriers of ethnic group in learning mathematics education.But due to the ethnic group and other environment affect participation and achievement of Dalit students in mathematics education in Nepal.

I am more familiar with Dalit society since I got birth in this group of people and growth this society. I have got a lot of experience problem and the weakness of Dalit students that is also seen in mathematics education. I haveinvolved in education sector so, I have seen low achievement of Dalit students as comparison of non-Dalit students. Hence, so I want to know what the participation level of Dalit students is as these two words, learning participation and achievement are indeed, interrelated with each other and also how is their achievement according to their participation in mathematics learning. This study would have following significance.

- This study would help to know about the inter-relationship between the learning participation and achievement seen in this teaching process.

- Thisstudy would help to motivate and encourage the Dalit students to study mathematics.

- This study would help the teacher as well as parents to create better learning environment and make awareness to provide researchable educational facilities.

- This study would help to inform about the condition of Dalit students with stakeholder who run various programmer related for this society and education planner.

- This study would be helpful for researchers to seek further study.

Delimitation of the Study

Every study is not perfect and free from limitation. So every study has its own limitation use to limited resources, time and physical aspects. So this study would be conducted within the following delimitations.

- The study was limited on Kavre district.

- This study was included only grade VII students of public schools

- This study was conducted only for the subject of mathematics.

- This study waslimited only among Dalit students.

Definitions of terms

Dalit:Person or group of people who are socially, economically, culturally or politically disadvantaged. According to Nepali dictionary, "caste or group of people who are unable to get equal right, prestige and proud in the society, exploited and disadvantaged caste or group of people due to unequal social system."

Students: This term is used for both boys and girls of Dalit students of grade VII in selected public school.

Participation: Participation in this study is defined interims of the class attendance, classroom interaction (with teacher and other students) and extra activities (homework, class work, class text etc.) of Dalit students at basic level.

Teacher: A person who teaches mathematics subject at grade VII on public school.

Achievement: Achievement of this study is defined in terms of the scores obtained by the students on the achievement test administered by the researcher.

Chapter-II

REVIEW OF RELATED LITERATURE

Empirical Literature Review

Literature review is the one of the most important part of research. So very significant study is simply based on relevant thinking research reports, articles, book, journal, abstracts and magazines which has already done. A researcher must have deeply knowledge of already established research and a theory, which is closely related to the problems, chooses by researcher below are some of the review of these studied which are relevant the present study.

Mathematics achievement and Dalit students

K.C. (2001) had conducted a research on the topic, "A comparative study of achievement in mathematics of primary level students of chhetri, Tharu and Kami castes in Surkhet district. "The main objective of this study was to compare the mathematics achievements of the primary school going pupils of chhetri, tharu and Kami communities of the surkhet district. This study is qualitative in nature and the conclusion of this study was chhetri student's achievement was higher than Tharu and Kami students in the district level achievement test. There is no significant different in achievement of Tharuand Kami although Tharu students mean achievement was found to be higher than those of Kami, Chhetri and kami students are found scattered though many parts of district whereas Tharu students remain confined within certain school.

Basel (2007) had conducted a research 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 statues and achievement of Dalit students and to determine the correlation between socio-economic status and mathematics achievement of Dalit students. The researchertook ten primary schoolpurposivelyfor the studybased on Dalit students. The conclusion of this study was the mean score of educated father's children is higher than the mean score of uneducated father's children and other (agricultural, trade, caste specific). The mean score of small family size children obtain the higher score than middle and large family size children's scores. The variables father's education, occupation and family income were positive correlated each other but negatively correlated with family structure.

Likewise,Thapa (2001) did a research entitled, "Learning strategy for out of school children from Dalit community." His main target in this research was to find out the learning skills and ways of learning the daily life of untouchable children. To examine the skills which are helping them for better life and suggest the ways of establishing linkage between everyday life and out of school children's program curriculum. For the data collection, the researcher developed a form of table and set of questionnaire visited selected person which by purposively. This is a case study in qualitative nature. He found the different between social and classroom learning in out of school grades more emphasis was placed on theoretical aspects and less on practical. The study drew some implications for the improvement of learning and learning methods of the out of school program curriculum. And he also suggested that the OSP materials must be related to every life of the children and their ways of learning.

Paudel (2005)studied, "Learning strategies ofmathematical concepts of out of school." His main target in this research was to find out skills and ways of learning mathematics in the daily life of the untouchable children who were out of school.

The researcher focused his research Dalit students (Kami and sarki) how they are learning mathematics. From this study researcher found that non-schooling children from Dalit caste learned mathematics through their everyday life in different ways as learned by looking other work, by learning from their peers, parents and elders. He also found that the formation of mathematical idea on Dalit children began with household work, from works, labor work, playing and other activities.Some mathematical knowledge was acquired traditionally limitation, observation, active participation and soon.

Thapa (2012) studied entitled with "Participation and achievement of Dalit students in lower secondary school level." His main objective of his study was to investigate the relation between participation and achievement level of Dalit students in lower secondary level mathematics in Salyan district. The design of his study was mix method case study only taking four students as a sample with using the tools class observation form, interview guidline, test and questionnaire. From this study researcher found that relationbetween participation and achievement of these students is positive. In this study he do case study in small sample so how is the relation between participation and achievement of Dalit students in survey design among large sample it being concern for me.

Gender based participation and mathematics achievement

Pant (2002) had conducted her study on the topic, "A study of achievement and participation of female in bachelor level mathematics education." The study aimed to compare the mathematics achievement of male and female students in bachelor level and to find out the factors affecting participation in bachelor level and this study reached at the conclusion that there is no difference in mathematical achievement in

higher education by gender/sex. Social factor such as discrimination behavior, economic conditions lack of time for hard labor are responsible for making owner participation of female in the study of mathematics.

Similarly,Baniya (2012) did a study on "Girl's Participation at Higher Secondary Level Mathematics in Rautahat District ". He concluded that participation of girl's students in mathematics is very low. Society as a whole believed that female is mathematically less capable than the male. This belief is communicated by parents and teachers to students. Girls come to view their failure in mathematics as evidence that they indeed feel inferior and view their success as flunks. This reinforced the belief that they are not capable of doing well in mathematics   achievement. So they are not participation in mathematics.

Mathematics achievement and environment

 Yadav (2015) has conducted his study on the topic, "Mathematics learning environment at higher achiever and low achiever higher secondary school". The main objective of the study were finding situation of learning environment of high and low achievement and providing information to the stakeholder how the learning environment effects for achieving high and low achievement in mathematics. From his study he has concluded that social value and norm, economic status, parent's occupation, student's attitude to the mathematics, teacher's behavior and cultural perspective to gender for learning mathematics. Thus stakeholder need to concern for improving the students achievement in mathematics.

Cameronn, Gugy; Pierce, W. David; Banko, Katherien (2005) conducted a research on "Achievement- Based Rewards and intensive motivation: A Test of cognitive Mediators". They say that the study assessed how rewards impact intrinsic motivation

when students were rewarded for achievement while learning an activity, for performing at a specific level on a test or for both. Undergraduate university students engaged in a problem solving activating. The design was 2*2factorial with 2 levels of rewards in 2 learning phase (reward for achievement, no reward) and two level of reward in a test phase. Intrinsic motivation was measured as time spent in the experiment task and rating of task interest during a free-choice period. A major finding was that achievement based on increased participant'sintrinsic motivation. A path analysis indicated that two processes (perceived competence and interest- internal attribution) mediated the positive effects of achievement-based rewards in learning and testing in intrinsic motivation. Findings are discussed in terms of cognitive evaluation, attribution and social cognitive theories.

Likewise,Based on DNF annual Report (2053 B.S.) Dalits are being exploited everywhere in every sphere of life, such as exclusion from temples public drinking water system, employment, education and other opportunities. Majority of Dalitsthemselves are still unknown of constitutional provision and unaware of their fundamental rights because they are illiterate, poor and dissepimental in every sphere of life by the upper castes People. Government too has not fully implemented any of the programs against caste discrimination and unsociability declared till now.

Dhakal (2008) had conducted on the topic, "Mathematics achievement of grade VI students in Kavre district." The objective of this study was to find out the mathematics achievement and to compare the mathematics achievement of students studying institutional and public school. From his study he had drawn the concision that the achievements level of students, studying in institutional and public school. From his study he had drawn the conclusion that the achievement level of students, studying in institutional school and the achievement of girls and boys have almost same.

After reviewing the above literatures Specially, I got among all these literatures; some are related socio-economic condition of Dalit students and their achievement in mathematics, some are related to the comparative achievement of Dalit students and non-Dalit students and some are related participation in mathematics learning in different levels, so I became curious to know about the Dalit students how is their participation level and achievement level in mathematics learning. In the previous time Dalit are dominated community so they are backwarded in any social activities, really Dalits are being exploited everywhere in every sphere of life, such as exclusion from temples, public drinking water system, employment, education and other opportunities that tradition is still remaining in some parts of Nepal which is faced by Dalit students so, that may impacts in the participation and achievement in mathematics learning of Dalit students. That's why it is being concern of my research.

Theoretical Framework

According to Cobb (2007), theoretical contributions in the field of mathematics Education has come primarily from four traditions: experimental psychology, cognitivePsychology, distributed cognition, and sociocultural theory. This study draws primarily on sociocultural theories of learning because of its explicit emphasis on theoretical. Assumptions regarding social and cognitive development that hinges on participation in Cultural practices (e.g., language socialization through participation in classroom. Discourse or understanding of mathematics from informal, out-of-classroom experiences, Etc.). Moreover, data collection and analysis focused on the processes by which studentsbecame participants in various roles in mathematics learning. So the researcher introduces the theoretical discussion, which is relevant for the interpretation of the findings of the study.

There are various theories related to children's participation for the learning development in mathematics.Especially this study is guided by socio-cultural theory or social constructivist theory which is known as Vytotskian theory Vygotsky, L .S. (1978). He was famous scholar who emphasize on the social constructivism. Vygotskian theory is one of the theory regards as social interaction between teachers, peers, adults and involving in the related academic works as important aspect increasing meaning making sense, knowledge, concepts and conveying culture within the shared context.

Vygotskian theory guided the teacher creates a context for learning on the basis ethics and culture, in which students can be participate in learning activities that encourages and facilitates for learning.All classrooms in which instructional strategies compatible with Vygotsky's social constructivist approach used don't necessary look alike. The activities and the format can vary considerably. However, four principles are applied in any Vytotskian classroom.

- Learning and development is a social collaborative activity, which supports for achievement.

- The zone of proximal development conserve as a guide for curricular and lesson planning that helps to increase learning achievement of students.

- School learning should occur in a meaningful context and not be separated from learning and knowledge of children develops in the real world."

- Out-of-school experiences should be related to the child's school experience thatencourages them to interact with their teacher and peers.

Vygotsky describes a theory that "Zone of proximal development (ZPD)" in this theory the Childs needs some mediators like parents, teachers and peers to uplift his/her knowledge. Children's knowledge is not from only individual but also the context and the interactions of the more knowledge others. Schitizi (2002) describes VygotskianZPD. He says that every child has individual difference due to different social and cultural norms and values so, child have different capacity for learning and solving problems.

Vygotsky stress that the child constructs the knowledge from maturation and culture there the external culture knowledge is internalizes with the help of their parents, teachers and the conversation of community. Specially this theory also may support pupils for participation in leaning and improve their learning achievement that is from the backward society. The psychological perceptivities and describes about the insides of the individual and also situation, environment and opportunity in participating in learning. In other words it is more focused on the individual behaviors, relation to society or group and community iterations. So Vygotsky's theory of ZPD, private speech and scaffolding are helpful. For this researcher to build the behavior of basic level mathematics and Dalit students of Kavre district in accordance with the principles of learning participation for their achievement.

Conceptual Framework of the Study

This study focuses to participation of Dalit students in mathematics learning activities and their achievement in mathematics. To guide this study a conceptual framework is organized in the following diagram.

Figure: 1
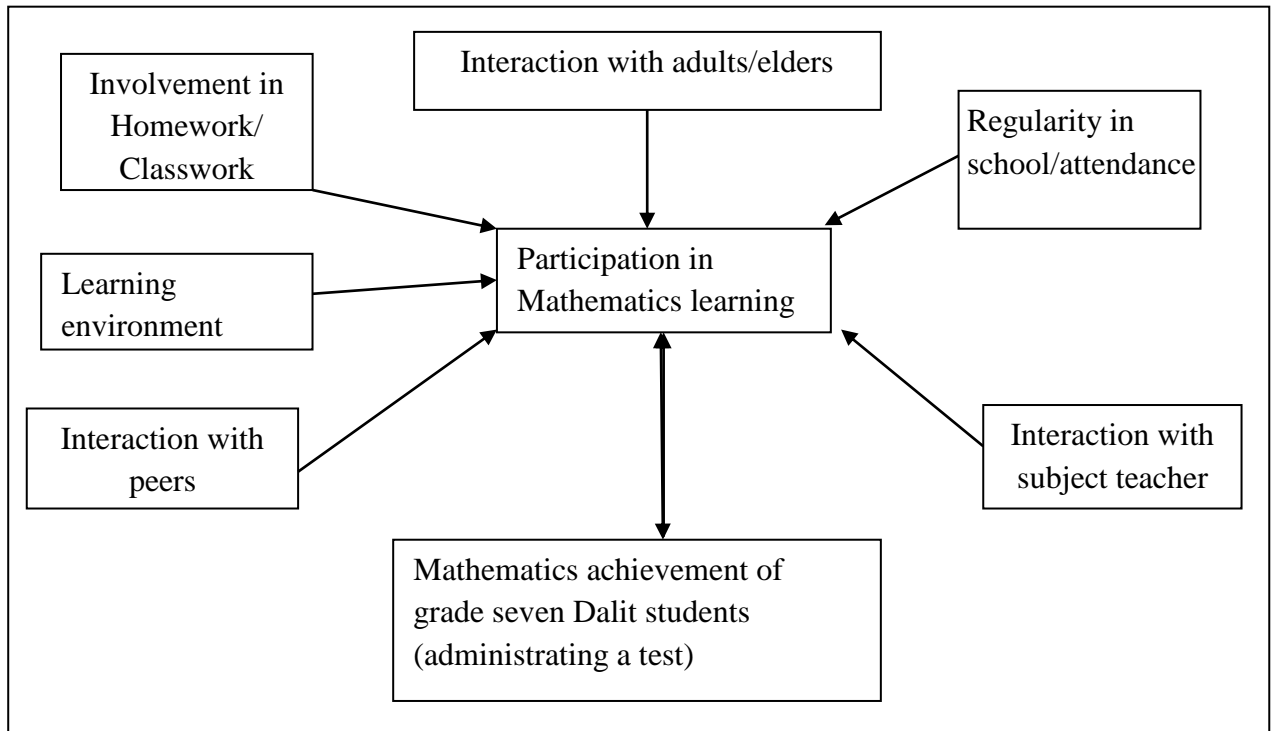
Source: Brian S. Lack *Georgia State University (2010)*

Fortheresearch of participation andachievement of Dalit students in mathematics learning, here above variables are categorized in the dependent and independent variables which are closely interrelated to each other. Involvement in Homework and/ Classwork (work given by teacher, time, study time table and classroom activities), Interaction with adults/elders (habit of discussion, response and interest for discussion), learning environment (guidance in home, separate study room, light for study and distance of school), regularity in school, interaction with peers (teach to friend, learn from friend, interest for discussion, and group work activities) and interaction with the subject teachers (habit discussion with teacher ,response of teacher) are the independent variables and the participation in learning Mathematics and achievement (test conducted by researcher) are dependent variables which depend on above independent variables.

Chapter -III

METHODS AND PROCEDURES

This chapter deals about the method and procedures which is the one part of research methodology that determines how the research becomes complete and systematic. Method and procedures does not mean only collect data/information but also means the use of appropriate research method. As methodology is the root of the research. So, the researcher should be clear about the design of study, selected population, tools, procedure of data collection, scoring procedure, statistical techniques to be used and analyzing or interpretation of collected data/information.

Design of the Study

A research design or study is the planning structure and strategy of investigation, which is a complete scheme or program of the research. The design of the study was quantitative survey design research method. This is a survey design study to find the student's participation and achievement in mathematics learning.

Population of the Study

The population of this study was studying students in grade VII in public school of Kavre district in academic year 2073 B.S.

Selection of Respondent

The respondents of the study were selected from selected schools, Shree Janakalyan Higher Secondary School Ghartichhap-6, Kavre, Shree Shamveshwor lower secondary school Ghartichhap-1, Kavre, Shree Jana Mohan Secondary School Bankhu-3, Kavre, Shree Azad Lower Secondary School Bankhu-5, Kavre, Shree Gokule

Secondary School Gokule-2, Kavre and ShreeBhairab Secondary School Gokule-3,

Kavre. As a sample 76 students were selected from these all schools and purposive

sampling was used for students have been taken as the sample of this study.

Table 1 gives the detail information of the sample

Table 1

Schoolwise Description of the sampled students

Name of school	No of students		Total
	Boys	Girls	
Shree Janakalyan Higher Secondary School	7	7	14
Shree Shamveshwor lower secondary school	5	2	7
Shree Jana Mohan Secondary School	10	4	14
Shree Azad Lower Secondary School	4	4	8
Shree Gokule Secondary School	10	6	16
ShreeBhairab Secondary School	8	9	17
Total	44	32	76

Tools and Instruments of the Study

For collecting the data, the researcher developed an achievement test paper to find the

achievement of Dalit students and prepared a questionnaire to find out participation in

mathematics learning. The flowing techniques would be used during field study in this

research work.

- **Questionnaire**

Questionnaires were prepared to collect the factual primary data or information from the related students. For the students, the questionnaires were developed by the researcher himself under the conceptual framework. Then the researcher collected the information of student's participation in mathematics learning regarding to regularity in school/attendance, involvement in homework/ classwork, interaction with subject teacher, interaction with adults/elders, learning environment and interaction with peers. The questionnaire involved closed questions (See Appendix-A).

- **Mathematics Achievement Test for Students**

In this process of data collection the researcher constructed an achievement test paper with the help of prescribe curriculum and text book of mathematics of grade seven consisting 30 multiple choice items. According to the objectives, the question of the test paper had selected on equal weightage given for each chapter. Being the only subject of compulsory mathematics taught in grade seven covering the different areas as set, arithmetic, algebra and geometry. There were2(6.66%) item from set 15(50%) item from arithmetic, 5(16.67%) item from algebra and 8(26.67%) item from geometry and it contained 9(30%) item from knowledge, 7(23.33%) item from comprehension, 8(26.67%) item from skill and 6(20%) item from application level domain (See Appendix -C). The items covering different level of cognitive domain were show in the following table.

Table 2

Item Covering Area of Mathematics and Level of Cognitive Domain

| S.N. | Area of mathematics | Level of cognitive domain | | | | |
		K	C	S	A	Total
1	Set	1	1			2(6.66%)
2	Arithmetic	3	3	5	4	15(50%)
3	Algebra	2	1	1	1	5(16.67)
4	Geometry	3	2	2	1	8(26.67%)
Total		9(30%)	7(23.33%)	8(26.67%)	6(20%)	30(100%)

Note: K=Knowledge, C=Comprehension, S=Skill, A=Application

Validity and Reliability of Instruments

To ensure the good quality of the test, the validity and reliability should be checked of the test which also supports to find the truth and quality research findings and conclusions. The validity of the questionnaire was established its approval from the mathematics education experts, school teachers and thesis supervisor and for the reliability of test was done through carrying out pilot test prepared 20 non-Dalit students of Shree Janakalyan Higher Secondary School inKavre. Before administering the test paper, the researcher instructed the students how to respond the test paper. The reliability of the test was determined by using split-half method in score on the odd and even items of 30 items. From the calculation the reliability coefficient was found 0.84 (See Appendix-E) also the reliability of the test was determined by using the item analysis of the score of 20 students (See Appendix-F)

Item Analysis of the Test

The difficulty level and discrimination index of test was computed to check the quality of the test items. The item analysis was accomplished by administering 20 non-Dalitstudents of grade seven of Shree Janakalyan Higher Secondary School Ghartichhap-6, kolbot, Kavre. The test items were score 1(one) for correct response and 0 (zero) for incorrect response on each multiple choice items. Level of difficulty and power of discrimination of each item was calculated from 27 percent i.e. 6 students of higher score, 27 percent i.e. 6 students of lower score and remaining i.e.8 students medium score. P-value or D-value of each item was calculated from the tabulated 27 percent of the lower scores of 20 students on the test in the given relation. Item number 12 and 16 were rejected becausewho's P-value or D-value do not lie between 0.40 and 0.90 or below 19 percent. So, these test itemswere cancelled. In this way items analysis were accepted for the final form in appendix-C. Hence the refined achievement test paper contains only 30 items. (See Appendix-C)

Data Collection Procedure

The researcher visited the sampled school. Then the researcher met the head teacher, mathematics teachers, and students and explained in detail the purpose of the visit and took permission. The sample of this study was 76 students. Total sample were divided in six groups according to Dalit student's participation in mathematics learning. Before administering the test, the researcher explained the answering procedure of test. The time allocated for completing the 1:30 hour. After the time duration of examination the answer sheets were collected and score by the researcher. Then researcher distributed the questionnaire for the students to respond the answer and obtained the information about participation in mathematics learning as regularity in school/attendance, involvement in homework/ classwork, interaction with subject teacher, interaction with

adults/elders, learning environment and interaction with peers. Student's answer compare with their achievement score. From the above process researcher collected the raw data. Then it was ready to analyze.

Scoring Questionnaire forLearning Participation Level

After collecting the data, researcher used Likert-Scale to score the response given by students in questionnaire for finding the participation level in mathematics learning. In which every items of questionnaire divided into three levels as 1, 2 and 3. So, students who do (involve) their homework and classwork always is scored level three (3), usually level two (2) and sometimes is level one (1) for involvement in homework and classwork,students who interact usually is scored level three (3), sometimes level two (2) and never is level one (1) for interacting with adults/elders,students who have the good learning environment is scored level three (3), general level two (2) and nothing is level one (1) for learning environment,students who present school always is scored level three (3), usually level two (2) and sometimes is level one (1) for regularity in school,students who interact usually is scored level three (3), sometimes level two (2) and never is level one (1) for interacting with peers andstudents who interact always is scored level three (3), sometimes level two (2) and never is level one (1) for interacting with subject teacher (See Appendix-B).

Data Analysis Procedure

The researcher analyzed the obtained data by calculating the percentage, mean, standard deviation and correlation coefficient. The mean was used to find the mathematics achievement of students, participating in same level of activities and standard deviation to find the variability of mean. Pearson's correlation coefficient was used to determine the relationship between dependent and independent variable.

Chapter-IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the statistical analysis and interpretation of data obtainedby using the tools, achievement test and questionnaire for participation of Dalit students in learning mathematics survey from the sample of students. The data for the study were collected from the sampled students at grade seven. Survey was used to know information about participation of Dalit students in mathematics learning and its relation on mathematics achievement. These are tabulated and analyzed by using percentage, mean, standard deviation and correlation coefficient. The data obtained by above mentioned tools are analyzed under the following heading:

- Percentage to find the number of participated Dalit students in learning mathematics in different participation level as in role models (Involvement in Homework and/ Classwork, Interaction with adults/elders, learning environment, regularity in school, interaction with peers and interaction with the subject teachers)

- Mean and standard deviation of mathematics achievement of Dalit students by participation of Dalit students in learning mathematics as different role models (Involvement in Homework and/ Classwork, Interaction with adults/elders, learning environment, regularity in school, interaction with peers and interaction with the subject teachers)

- Correlation between mathematics achievement of Dalit students and participation of Dalit students in learning mathematics are related variables.

Analysis of Mathematics Achievement of Students According to their participation in learning mathematics as Involvement in Homework and Classwork

The percentage, mean and standard deviation of the score obtained by the students according to participation in learning mathematics as Involvement in Homework and/ Classwork (how is their participation in homework and classwork) is presented on the following table.

Table 3

Percentage, Mean and Standard Deviation of Mathematical Achievement of Students with their participation in learning mathematics as Involvement in Homework/ Classwork

Group	No. of case	Percent	Mean	S.D.
Always	20	26.32%	17.32	1.25
Usually	34	44.74%	14.71	2.77
Sometimes	22	28.94%	13.54	3.20

From the above table it is shown that the percentage of involvement in homework and classwork of students of participation level always, usually and sometimes (See Appendix-B)are 20 (26.32%), 34 (44.74%) and 22 (28.94%). Similarly the mean score of students who always, usually and sometimes involve in homework and classwork are 17.32, 14.71 and 13.54 with standard deviation 1.25, 2.77 and 3.20 respectively. Therefore the percentage of participation in learning mathematics always in their homework and classwork is higher than the percentage of as usually and sometimes. Similarly the mean score of students who were involved always in their homework and

classwork is higher than the mean score of as usually and sometimes. It is also shown that the mean score of usually doing homework and classwork is higher than the students who do their homework and classwork sometimes. It shows that student's mathematics achievement increases as the Involvement in Homework and/ Classwork always.

Analysis of Mathematics Achievement of Students According to their participation in learning mathematics as Interaction with adults/elders

The percentage, mean and standard deviation of the score obtained by the students according to participation in learning mathematics as Interaction with adults/elders (how do they Interact and concern for learning mathematics with adults/elders) is presented on the following table.

Table 4

Percentage, Mean and Standard Deviation of Mathematical Achievement of students with their participation in learning mathematics as Interaction with adults/elders

Group	No. of case	percent	Mean	S.D.
Usually	23	30.26%	11.26	4.51
Sometimes	17	22.37%	16.35	2.29
Never	36	47.37%	14.53	3.15

From the above table it is shown that the percentage of student's interaction with adults/elders of participation level usually, sometimes and never (See appendix-B) are 23 (30.26%), 36 (47.37%) and 17(22.37%). Similarly the mean score of students who usually, sometimes and never interact with adults/elders are 11.26, 16.35 and 14.53 with standard deviation of 4.51, 2.29 and 3.15 respectively and the percentage of participation in learning mathematics never in their Interacting with adults/elders is higher than the percentage of as participation level usually and sometimes. Similarly the mean score of students who were sometimes interacting with their adults/elders is higher than the mean score of as usually and never. It is also shown that the mean score of never interacting with adults/elders is higher than the students who were interacting with adults/elders usually. It shows that the Interacting with adults/elders sometimes if they have necessary increases the mathematics achievement of students.

Analysis of Mathematics Achievement of Students According to their participation in learning mathematics as learning environment

The percentage, mean and standard deviation of the score obtained by the students according to participation in learning mathematics as learning environment (Taking time to reach at school, needy materials and home environment) is presented on the following table.

Table 5

Percentage, Mean and Standard Deviation of Mathematical Achievement of Students with their participation in learning mathematics as learning environment

Group	No. of case	percent	Mean	S.D.
Good	21	27.63%	17.45	1.83
General	30	39.47%	15.60	2.69
Nothing	25	32.90%	12.82	3.43

 From the above table it is shown that the percentage of student'slearning environment for participating in learning mathematics good, generaland nothing level (see Appendix-B) are 21(27.63%), 30 (39.47%) and 25(32.90%). Similarly the mean score of students who have good, general and no learning environment for learning mathematics are 17.45, 15.60 and 12.82 with standard deviation of 1.83, 2.69 and 3.43 respectively. Therefore the percentage of students having good environment is lower than the percentage of having general and no environment. Similarly the mean score of students who have good learning environment is higher than the mean score of students having general and no learning environment. It is also shown that the mean score of having general learning environment is higher than the no environment for learning. So we can conclude that learning environment directly affect to their mathematics achievement.

Analysisof Mathematics Achievement of Students According to their participation in learning mathematics as regularity in school

The percentage, mean and standard deviation of the score obtained by the students according to participating in learning mathematics as regularity in school (how is the continuity for coming school) is presented on the following table.

Table 6

Percentage, Mean and Standard Deviation of Mathematical Achievement of Students with their participation in learning mathematics as regularity in school

Group	No. of case	percent	Mean	S.D.
Always	26	34.21%	17.15	1.74
Usually	32	42.10%	15.48	2.62
Sometimes	18	23.69%	13.26	1.27

The above table shows the percentage of participation in learning mathematics as regularity in school of always, usually and sometime are 26(34.21%), 32(42.10%) and 18(23.69%). Similarly the mean score of students of their participation level (See Appendix-B) in learning mathematics as regularity in school as always, usually and sometime are 17.15, 15.48 and 13.26 with standard deviation 1.74, 2.62 and 1.27 respectively. Therefore the mean score of students who are always regularity in school is higher than usually and sometime coming at school. It has also shown that the mean score of having usually regularity in school is higher than the regularity in sometime. This shows that the student's regularity in school plays the vital role for increasing mathematical achievement.

Analysis of Mathematics Achievement of Students According to their participation in learning mathematics as interaction with peers

The percentage, mean and standard deviation of the score obtained by the students according to participation in learning mathematics as Interaction with peers (how do they Interact and concern for learning mathematics with their peers) is presented on the following table.

Table 7

Percentage, Mean and Standard Deviation of Mathematical Achievement of Students with their participation in learning mathematics as interaction with peers

Group	No. of case	percent	Mean	S.D.
Usually	33	43.42%	14.98	4.13
Sometimes	24	31.58%	15.50	2.38
Never	19	25.00%	11.43	2.77

From the above table it is shown that the percentage of student's interaction with peers of participation level (See Appendix-B) usually, sometimes and never are 33 (43.42%), 24(31.58%) and 19(25%). Similarly the mean score of students of usually, sometimes and never to participating in learning mathematicsare 14.98, 15.50 and 11.43 with standard deviation of 4.13, 2.38 and 2.77 respectively and the percentage of participation in learning mathematics usually in their Interacting with peers is higher than the percentage of as sometimes and never. Similarly the mean score of students

who were sometimes interacting with their peers is higher than the mean score of as usually and never. It is also shown that the mean score of usually interacting with their peers is higher than the students who were interacting with their peers never. It shows that the Interacting with peers sometimes if they have need increases the mathematics achievement of students.

Analysisof Mathematics Achievement of Students According to their participation in learning mathematics as interaction with the subject teachers

The percentage, mean and standard deviation of the score obtained by the students according to participation in learning mathematics as Interaction with the subject teacher (how do they Interact and concern for learning mathematics with their teacher) is presented on the following table.

Table 8

Percentage, Mean and Standard Deviation of Mathematical Achievement of Students with their participation in learning mathematics as interaction with the subject teachers

Group	No. of case	percent	Mean	S.D.
Always	15	19.74%	16.28	2.65
Sometimes	24	31.58%	14.25	3.31
Never	37	48.68%	12.56	2.07

From the above table it is shown that the percentage of student's interaction with the subject teacher of always, sometimes and never participation level (See Appendix-B)are 15 (19.74%), 24 (31.58%) and 37(48.68%). Similarly the mean score of students of

always, sometimes and never interact with the subject teacher for participating in learning mathematicsare 16.28, 14.25 and 12.56 with standard deviation of 2.65, 3.31 and 2.07 respectively. It is shown that the mean score of students who were always interacting with the subject teacher is higher than the mean scoring of as sometimes and never. It is also shown that the mean score of sometimes interacting with the subject teacher is higher than the students who were interacting with their subject teacher never. It shows that the students, who were interacting, pay attention and concern for learning mathematics always with their subject teacherincreases the mathematical achievement of students.

Average Comparison of Mathematics Achievement of Students According to above related independent variables

Mean and standard deviation of the score obtained by the students according to participation in learning mathematicsas Involvement in Homework and/ Classwork, as Interaction with adults/elders, as learning environment, as regularity in school, as interaction with peers and as interaction with the subject teachers are presented on the following table.

Table 9

Average Mean and Standard Deviation of Mathematical Achievement of Students According to Above Related Independent Variables

S.N	Variables	Mean	S.D.
1	Involvement in Homework and/ Classwork	15.19	1.58
2	Interaction with adults/elders	14.38	2.17
3	Learning environment	15.30	2.05
4	Regularity in school	15.06	1.59
5	Interaction with peers	14.30	1.33
6	Interaction with the subject teacher	14.36	1.52

The above table of mean score of student's participation in learning mathematics as Involvement in Homework and Classwork, as Interaction with adults/elders, as learning environment, as regularity in school, as interaction with peers and as interaction with thesubject teacherare 15.19,14.38, 15.30, 15.06,14.30 and 14.36with the standard deviation 1.58, 2.17, 2.05,1.59,1.33 and 1.52 respectively. The mean score of learning environment for mathematics learning is higher than theInvolvement in Homework and Classwork, the mean score of Involvement in Homework and Classwork is higher than the regularity in school and the mean score of learning environment, Involvement in Homework and Classwork and regularity in school is higher than the Interaction with

adults/elders, as interaction with peers and as interaction with the subject teachers. So we can conclude that the mean score of learning environment, Involvement in Homework and Classwork and regularity in school is directly proportional to the achievement of the students. It is also shown that the independent variable i.e. the learning environment, Involvement in Homework and Classwork and regularity in school are more affected to the achievement of the students then other independent variables.

Correlation between Mathematical Achievement andparticipation in learning mathematics related variables

Correlation between Mathematical Achievement and participation in learning mathematics related variables (as Involvement in Homework and Classwork, as Interaction with adults/elders, as learning environment, as regularity in school, as interaction with peers and as interaction with the subject teacher) are presented in the table below.

Table 10

Correlation between Mathematical Achievement and participation in learning mathematics related variables

Variables	Correlation Coefficient
Involvement in Homework and/ Classwork	0.756
Interaction with adults/elders	0.102
learning environment	0.831
regularity in school	0.532
interaction with peers	0.225
interaction with the subject teacher	0.426

The above table shows the correlation between mathematics achievement and six independent variables as Involvement in Homework and Classwork, Interaction with adults/elders, learning environment, regularity in school, interaction with peers and interaction with the subject teacher. Analysis of the data resulted from the Pearson's correlation analysis (See Table 10). The results of this study shows that there is a significant relationship between mathematics achievement and independent variables as Involvement in Homework and Classwork, learning environment, regularity in school and interaction with the subject teacher with correlation coefficient r= 0.756, 0.831, 0.532, and 0.426 respectively (See Appendices-G1, G3, G4 and G6) which shows that the mathematics achievement and these independent variables are more correlated. It is also shows that there is least relationship between mathematics achievement and

independent variables, interaction with peers and interaction with adults/elders with correlation coefficient r= 0.225, 0.102respectively (See Appendices-G5 and G2).

The above table shows that the mathematics achievement of students is found to be strongly associated with independent variables as learning environment andinvolvement in Homework and Classwork, the mathematics achievement of students is found moderately associated with independent variables as regularity in school and interaction with the subject teacher and the mathematics achievement of students is found least associated with independent variable interaction with peers and interaction with adults/elders.

Discussion on Findings

After analyzing and interpreting the data in different role model of participating in learning mathematics, I got some results about participation of students in mathematics learning and its effect on mathematics achievement. Vygotskian Socio-constructivist theory said that if the child actively participates to their learning activities got the effective and meaningful achievement. So, in my researchthe mean score of students who always, usually and sometimes involve in homework and classwork are 17.32, 14.71 and 13.54 with standard deviation 1.25, 2.77 and 3.20 respectively and the mean score of students who are regularity in school as always, usually and sometime are 17.15, 15.48 and 13.26 with standard deviation 1.74, 2.62 and 1.27 respectively. It has shown that students who are more active for learning mathematics as always do their homework /classwork and present in school do better in mathematical achievement than the students who are less active for learning mathematics as doing theirhomework /classwork and present in school usually and sometimes.

Similarly,Vygotskian Socio-constructivist theory also said that learning environment plays the vital role for gaining knowledge and good learning achievement to the children i.e. learning environment differs to the children's learning achievement. In my research,the mean score of students who have good, general and no learning environment for learning mathematics are 17.45, 15.60 and 12.82 with standard deviation of 1.83, 2.69 and 3.43 respectively. It has shown that the students who have the good learning environment have better mathematical achievement than the students who have the general and no learning environment.

Likewise,Vygotskian Socio-constructivist theory stated that the learning principleas MKO, ZPD and social interaction i.e. how children can learn knowledge and skills. In my research,the mean score of students who always, sometimes and never interact with the subject teacher for participating in learning mathematicsare 16.28, 14.25 and 12.56 with standard deviation of 2.65, 3.31 and 2.07 respectively. It has shown that the mean score of students who were always interacting with the subject teacher is higher than the mean scoring of as sometimes and never. It is also shown that the mean score of sometimes interacting with the subject teacher is higher than the students who were interacting with their subject teacher never.

Similarly,the mean score of students who usually, sometimes and never interact with adults/elders are 11.26, 16.35 and 14.53 with standard deviation of 4.51, 2.29 and 3.15 respectively. It has shown that the mean score of students who were sometimes interacting with their adults/elders is higher than the mean score of as usually and never. It is also shown that the mean score of never interacting with adults/elders is higher than the students who were interacting with adults/elders usually. And the mean score of students who interact usually, sometimes and neverfor participating in learning mathematicsare 14.98, 15.50 and 11.43 with standard deviation of 4.13, 2.38 and 2.77

respectively. It has shown that the mean score of students who were sometimes interacting with their peers is higher than the mean score of as usually and never. It is also shown that the mean score of usually interacting with their peers is higher than the students who were interacting with their peers never. In this research learning principle as social interaction with subject teacher is direct relation and the relation interaction with adults/elders and peers is indirect proportional.

Chapter-V

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

After the analysis and interpretation of collected data according to design of study in this concluding chapter an attempt has been made to summarize, enlist the finding, conclusion for pedagogical purpose and recommendation for the study. The first section of this chapter presents the summary of the researcher; the second section presents its finding, the third section presents its conclusion and finally the last section presents recommendation based on the finding of the study. Especially this chapter presents the summary, finding, conclusion and recommendation of the study.

Summary of the Study

This study was under taken to identify the participation of student's in learning mathematics and mathematics achievement on grade seven for this study, the researcher developed the achievement paper with the help of prescribed curriculum and text of mathematics of grade VII and administrated the test in Shree Janakalyan Higher Secondary School in Kavre for the item analysis of the test and for checking its reliability and validity to standardize it. The researcher also developed student's questionnaire form where main instrument used in the study.

For this research the researcher selected six public schools with altogether 76 students from Kavre district. These data were obtained through the student's questionnaire and student's achievement test. The mathematics achievement was obtained from student's achievement test conducted by researcher. The student's questionnaire form was developed to get detail information about student's participation in learning mathematics as Involvement in Homework and/ Classwork, as Interaction

with adults/elders, as learning environment, as regularity in school, as interaction with peers and as interaction with the subject teachers

For data analysis of the study percentage, mean, standarddeviation and correlation coefficient were used. The percentage was used to find the number of student's participation in learning mathematics with different level. The mean was used to find the level of mathematics achievement, standard deviation was used to find the variability of mean and correlation coefficient was used to determine the relation between dependent and independent variable

Findings of the Study

The statistical analysis of the collected data yielded the following results as the finding of the study:

- Mean score of mathematical achievement of students who were involving always in Homework and/ Classwork found better than the mean score of students who were involving as usually and sometimes. It is also found that the mean score of students who usually doing homework and classwork is better than the students who do their homework and classwork sometimes.

- Similarly, mean score of students who were sometimes interacting with their adults/elders found better than the mean score of as usually and never. It is also found that the mean score of students who never interact with adults/elders is better than the students who were interacting with adults/elders usually.

- The mean score of students who have good learning environment found better than the mean score of students having general and no learning environment. It is also found that the mean score of students whohave general learning environment is better than the no environment for learning.

- Similarly, the mean score of students who were always regularity in school found better than usually and sometime coming at school. It is also found that the mean score of students who were having usually regular in school is better than the regularity in sometime in school.

- Mean score of students who were sometimes interacting with their peers found better than the mean score of as usually and never. It is also found that the mean score of students who were usually interacting with peers better than the students who were interacting with their peers never.

- Similarly, mean score of students who were always interacting with the subject teacher found better than the mean score of as sometimes and never. It is also found that the mean score of students who were sometimes interacting with the subject teacher is better than the students who were interacting with their subject teacher never.

- The mathematics achievement of students is found to be strongly associated with independent variables learning environment andinvolvement in Homework and/ Classwork, the mathematics achievement of students is found moderately associated with independent variables regularity in school and interaction with the subject teacher and the mathematics achievement of students is found least associated with independent variable interaction with peers and interaction with adults/elders.

Conclusion of the Study

From this study, In conclusion participation of students in mathematics learning, as learning environment,involvement in Homework / Classwork, regularity in school andinteraction with the subject teacher were highly concern with mathematics achievement of the students and Interaction with adults/elders and interaction with peers no more concern with mathematics achievement of the students.

Also it is found that there is a significant relationship between mathematics achievement and independent variables as Involvement in Homework and/ Classwork, learning environment, regularity in school and interaction with subject teacher. It is also found that there is no significant relationship between mathematics achievement and independent variables interaction with peers and interaction with adults/elders. it also found that the mathematics achievement of students is found to be strongly associated with independent variables learning environment andinvolvement in Homework and/ Classwork, the mathematics achievement of students is found moderately associated with independent variables regularity in school and interaction with the subject teacher and the mathematics achievement of students is found least associated with independent variable interaction with peers and interaction with adults/elders.

It concludes that the participation of students in mathematics learning is very essential for increasing the mathematics achievement. So, students would be able to increase mathematical achievement by actively participating in different role of mathematics learning as well as Involvement in Homework and/ Classwork, Interaction with adults/elders, learning environment, regularity in school, interaction with peers and interaction with the subject teacher. It shows that   few number students have the high participation level in mathematics learning and got the good achievement, but the large number of students has no sufficient participation i.e. low participation level in mathematics learning so, they got low achievement. That's why students needed to increase their activities in mathematics learning to enhance the good mathematics achievement. This research shows thatlearning environment, involvement in Homework and/ Classwork and regularity in school effected more
than other on mathematics achievement. If the students are not actively participate in mathematics learning, they cannot achieve better achievements in the mathematics.

Recommendations for Further Study

After concluding this study, the researcher got some finding. So, on the basis of those finding, the researcher would like to suggest some recommendation for student's participation in mathematics learning.

- Students should take actively participate in different role of mathematics learning as learning environment,involvement in Homework and/ Classwork and regularity in school to enhances the mathematics achievement.

- Comparatively, students should be focused in learning environment, homework/classwork, regularity in school and interacting with subject teacher than interacting with peers and elders.

- This kinds of study should be conducted at all levels of schools and as well as in other district.

- This study was limited to students of grade VII from six public schools of Kavre district. Hence the investigator cannot generalize the finding of the study to all grade and whole country. So, the similar study can be done region wise as well as nation wise.

Recommendations for Educational Implementation

After the recommendation following suggestion are provided for the educationalimplementation.

- Students should do their homework and classwork for learning mathematics.

- Parents should be managed proper environment to their children for participating in mathematics learning, which helps enhance mathematics achievement.

- Students should be regular in school for good mathematics achievement.

- Teacher should inspire their students in classroom discussion.

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Appendix-A

Questionnaire Paper for Students

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$_tkfO{sf] lzIfsn] tkfO{nfO{ l;fO{sf] nfuLpTk|]/0ff lbg'x'G5 <

  s_ lbg'x'G5   v_ slxn]sfxLFdfq   u_ lbg'x'b}g

%_tkfO{n] ;f]w]sf] k|Zgk|tLlzIfsn] s:tf] k|tLpQ/ lbg'x'G5 <

  s_ /fd|f]   v_;fdfGo   u_ l/;fpg'x'G5

^_tkfO{n] k|Zgubf{ lzIfsn] s:tf] k|tLls|of lbg'x'G5 <

s_ wGojfb lbg'x'G5 v_ ;fdfGo   u_ rf;f] lbg'x'Gg

&_tkfO{cfˆgf] ;fly;Fu ul0ft l;fOsf] nfuLcGt/ls|ofug{x'G5 <

  s_u5{' v_ slxn]sfxL u5{' u_ ulb{g

*_tkfO{;Fu cGojLBfyL{x?n] 5nkmnsf] nfuLrf;f] /fVg] u5{g\ <

  s_u5{g\ v_ slxn]sfxLF u5{g\ jf:t ub}{gg\

(_tkfO{n] ;f]w]sf ul0ftLo ;d:ofx? ;fyLx?n] l;fO{lbG5g\ <

s_ l;fpF5g\ v_ slxn]sfxLFdfq u_ jf:tfub}{gg\

!)_tkfO{n] slxNo} ;fyLx?nfO{ ul0ftLo ;d:of l;fpg'x'G5 <

  s_l;fpF5' v_ slxn]sfxLFdfq u_ 5}g

!!_;fyLx?;Fusf] ;fd'lxsls|ofsnfkdftkfO{sf] e'ldsf s:tf] /xG5 <

  s_;ls|o   v_ ;fdfGo u_ vf;} x'b}g

!@_ tkfO{sf] lzIfsn] lbPsf] u[xsfo{ 3/df ;w} ug]{ ug{'x'G5 <

 s_;w} u5{' v_ k|foh;f] u5{' u_] slxn]sfFxL u5{'

!#_ tkfO{n] 3/df ul0ft l;sfOsf] nfuLslt ;do lbg'x'G5 <

  s_ #) ldg]6hlt v_ $% ldg]6 hlt u_ ! 306f jf a9L

!$_tkfO{cf^gf] k9fO{sf] nfuL k9\g] ;do tfnLsfagfpg' ePsf] 5 <

s_ 5'   v_ ;fdfGo   u_ 5}g

!%_ tkfO{lzIfsn] lbPsf] slffsfo{ ;w} ug]{ ug{'x'G5 <

s_;w} u5{' v_ k|foh;f] u5{' u_] slxn]sfFxL u5{'

!^_slffdf ;~rfngx'g] ls|ofsnfkdftkfO{sf] e'ldsf s:tf] /xG5 <

  s_;ls|o   v_ ;fdfGo   u_ jf:tfnfUb}g

!&_tkfO{nfO{ 3/df ul0ft l;sfOsf] nfuL ;xhLs/0fsf] jftfj/0f pknAw 'x'G5 <

s_ /fd|f] v_ ;fdfGo u_ vf;} 5}g

!*_tkfO{nfO{ 3/dfcWoogug{sf] nfuL 5'6\6} sf]7fsf] AojZyf 5 <

  s_ 5   v_;fdfGo u_ vf;} 5}g

!(_tkfO{nfO{ 3/dfcWoogug{ alQsf] AojZyf s:tf] 5 <

  s_ /fd|f] v_;fdfGo u_ vf;} 5}g

@)_tkfO{sf] 3/ af6 ljBfnocfpgsl/a stL ;do nfUb5 <

s_ cfwf 306f v_ ! 306f u_! 306f eGbf al9

@!_tkfO{ v]n jfdgf]/~hgsf] nfuLslt ;do lbg'x'G5 <

  s_! 306f v_ @ 306f   u_ # 306f jf al9

@@_tkfO{ cfkm]'eGbf cuf8Lsf] bfO{lblbx?;Fu l;sfO{sf] nfuL 5nkmn ug]{ ug{'x'G5 <

  s_ u5{' v_ slxn]sfFxL u5{' u_ ulb{g

@#_ tkfO{n] ;f]w]sf ul0ftLo ;d:ofx? cfkm]'eGbf cuf8Lsf] bfO{lblbx?n] l;fO{lbGf] u5{g\ <

  s_ l;fpF5g\ v_ slxn]sfxLFdfq u_ jf:tfub}}{gg\

@$_ s] cuf8Lsf] bfO{lblbx?n] tkfO{{;Fu 5nkmnsf] nfuLrf;f] /fVg] u5{g\ <

s_ u5{g\ v_ slxn]sfxLF u5{g\ u_ jf:t} ub}{gg\

@%_ s] tkfO{ cuf8Lsf bfO{lblbx?;Fu 5nkmnsf] nfuL] OR5's x'g'x'G5 <

 s_ x'G5'   v_ slxn]sfxLF x'G5' u_ 5}g

wGojfb

Appendix-B

Variable Define

Scoring participation in learning mathematics as Involvement in Homework and/ Classwork

S.N	participation in learning mathematics as Involvement in Homework and/ Classwork	participation level
1	Always	3
2	Usually	2
3	Sometimes	1

Scoring participation in learning mathematics as Interaction with adults/elders

S.N	participation in learning mathematics as Interaction with adults/elders	participation level
1	Usually	3
2	Sometimes	2
3	Never	1

Scoring participation in learning mathematics as learning environment

S.N	participation in learning mathematics as learning environment	participation level
1	Good	3
2	General	2
3	Nothing	1

Scoring participation in learning mathematics as regularity in school

S.N	participation in learning mathematics as regularity in school	participation level
1	Always	3
2	Usually	2
3	Sometimes	1

Scoring participation in learning mathematics as interaction with peers

S.N	participation in learning mathematics as interaction with peers	participation level
1	Usually	3
2	Sometimes	2
3	Never	1

Scoring participation in learning mathematics as interaction with the subject teacher

S.N	participation in learning mathematics as interaction with the subject teacher	participation level
1	Always	3

| 2 | Sometimes | 2 |
| 3 | Never | 1 |

Appendix-C

Mathematics Achievement Test Paper

sIff—&   **;do M! 306f**

Ijifo—ul0ft   **k"0ff{ªs M#)**

IjBfyL{sf] gfd—

IjBfnosf] gfd—

tnlbO{Psfk|To]s j:t'ut k|Zgsfnflurf/j6f ;DefJopQ/x? /fd|f];Fu k9L pbfx/0fdf IbP h:t} ;Ix pQ/df I7s (√) IrGxnufpm .

pbfx/0fM olbA={1,2,3,4} / B={1,3,5} ePA∪B n] tnsf] s'g ;d'xnfO{ hgfpF5?

s_{1,3}√v_{1,2,3,4,5}   u_{1,2,3,4}   3_{1,3,5}

1. olb A={2,4,6,8,10} ePn(A) slt x''G5 ?

s_10   v_ 2   u_ 5   3_4

2. P={a,b,c,d,e} / Q={a,e,i,o,u}eP P∩Q n] tnsf] s'g ;d'xnfO{ hgfpF5?

s_ {a,e}   v_ {a,b,c,d,e}   u_ {a,b,c,d,e,i,o,u}   3_{a,e,i,o,u}

3. 26-3{24÷ (18÷6)} nfO{ ;/n ubf{ slt x'G5 ?

s_ 3   v_ 2   u_4   3_ 5

4. 18 / 24 sf] d.;.slt x'G5 ?

s_36   v_54   u_6   3_72

5. 625sf] ju{d"nslt x'G5 <

s_50   v_15   u_5   3_25

6.tnlbO{Psf ;+VofdWo] s'gcg'kflts ;+:of xf] <

s_ √2   v_√10/2   u_ 3/5   3_ -√14

7. 41 s:tf] ;+Vofxf] ?

s_ 3g ;+Vof   v_ ju{ ;+Vof   u_ ;+o'Qm ;+Vof   3_ ?9 ;+Vof

8. 75% nfO{leGgdfabNbfslt x'G5' <

   s_ 4/3   v_ 5/4   u_ 3/4   3_ 5/3

9. olb3, 4, 6 / a ;dfg'kft 5g\ eg] a sf] dfgslt x''G5 <

s_ 10   v_ 4   u_ 6   3_ 8

10. 300 sf] 20% n] slt x'G5 <

   s_ 20   v_ 60   u_ 30   3_ 40

11.ltdLn] Pp6f SofNs'n]6/ ? 625dflsg]/ ;fyLnfO{ ? 150gfkmf u/L a]Rof}
    eg] ltdLn] pQmSofNs'n]6/ sltdf a]Rof} <

   s_ 775   v_ 475   u_ 575   3_ 875

12. /fdn] Pp6f 38L ? 800 dflsg]/ hgsnfO{ ¿ 580df a]Rbfp;nfO{ slt 3f6f
eof] <

 s_¿ 1380   v_¿ 420   u_¿ 220   3_¿ 320

13.20 j6f sfkLsf] d"No ?640k5{eg] Pp6f sfkLsf] d"Noslt k5{ xf]nf<

s_ ¿22   v_ ¿32   u_ ¿42   3_ ¿12

14.15 j6f sndsf] d"No ?450k5{eg] 3 j6f sndsf] d"Nosltknf{ <

 s_ ¿30   v_ ¿80   u_¿60   3_ ¿90

15. ;fFjf(P),Aofhb/ (R) / ;do (T) lbO{Psf] cj:yfdf ;fwf/0f Aofh(I)lgsfNg] ;'q
tnsfdWo] s''gxf] <

s_ P x T x R/100 v_ Ix100/TxR   u_ Ix100/P xR   3_ I x 100/P x T

16. ltd|f] a'afn] a}sdf ? 12,000 sf] 10% jflif{s Aofhb/df2jif{dfsltAofh
kfpg'x''G5 xf]nf<

s_ ?1800 v_? 3600   u_ ¿1200   3_ ¿2400

17.30sf] 3g;+Vofslt x'G5 <

  s_900   v_ 27000   u_2700   3_ 270

18. 7 nfO{ldnfglrGxdf s;/L n]lvG5 <

s_ ///// v_//////   u ////   3_//////

19.3x⁷df 3nfO{ s] elgG5 <

s_ u'0ffᵃs v_ cfwf/   u_ 3ftfᵃs   3_ ;a}

20. olb a=2, b=3 / c=4 5 eg] 2a+5b-4csf] dfgslt x'G5 <

  s_5   v_2   u_ 4   3_ 3

21. olb4X+7=19 5 eg] X sf] dfgslt x'G5 <

  s_ 4   v_ 3   u_ 5   3_ 6

22.3X+5<20 sf] dfgslt x'G5 <

s_ X=5   v_ X>5   u_ X<5   3_ X<6

23. ;a} e'hfx? a/fa/ ePsf] lqe'hnfO{ s] elgG5 <
  s_;djfx'lqe'h   v_ ;dl4jfx" lqe'h   u_ ljifdjfx' lqe''h   3_ ;a}

24. 90°eGbf 7'nf] / 180°eGbf ;fgf] sf]0fnfO{ s] sf]0f elgG5 <
  s_;/nsf]0f   v_ clwssf]0f   u_ _ Go"gsf]0f   3_ ;dsf]0f

25.k~re'hsfslt j6f e'hf x'G5g\ <
  s_ 6 j6f   v_ 3 j6f   u_ 4 j6f   3_ 5 j6f

26.cfO{;ls|d s];sf] pbfx/0f xf] <
s_a]ngf   v_ 3g   u_ ;f]nL   3_ uf]nf

27. P (4,9) dfY—lgb]{zfªss'gxf] <
  s_ 4   v_ 9   u_ b'a}   3_ s'g} xf]Og

28. nDafO{ 4 cm / rf}8fO{ 5cm ePsf] cfotsf] kl/ldlt slt x''G5 <
  s_ 30 cm   v_ 20cm   u_ 9cm   3_ 18cm

29. Pp6f e'hf5cm ePsf] 3gsf] cfotg slt x'G5 <
  s_ 25cm^3 v_ 125cm^3 u_ 125cm^2 3_ 125cm

30· Pp6f sf]0f 90° ePsf] lqe'hnfO{ s'glqe'h elgG5<
  s_;dsf]0f lqe'h   v_ Go"gsf]0f lqe'h   u_ clwssf]0f lqe'h   3_ ;a}

Rejected Questions

1. 15 hgfdflg;n] s'g} sfd80 lbgdfug{ ;S5g\ eg] ;f] sfd60 lbgdf ;SgnfO{
   slthgfyKg'knf{ <
  s_ 4   v_ 5   u_ 6   3_ 7

2. 10 dlxgfdf ?10Jofhkfpg5%Jofhb/n] slt /sdhDdfug{'knf{ <
  s_ ¿120   v_ ¿140   u_ ¿240   3_ ¿300

Appendix-D

Answer key for achievement test

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	u	11	s	21	v
2	s	12	u	22	u
3	v	13	v	23	s
4	u	14	3	24	v
5	3	15	s	25	3
6	u	16	3	26	u
7	3	17	v	27	v
8	u	18	u	28	3
9	3	19	s	29	v
10	v	20	3	30	s

Appendix-E

Split half Method for Reliability of the Test

S.N	Obtained marks from even Q.N(X)	Obtained marks from odd Q.N(Y)	XY	X^2	Y^2
1	13	14	182	169	196
2	13	13	169	169	169
3	12	13	156	144	169
4	12	13	156	144	169
5	10	14	140	100	196
6	10	13	130	100	169
7	10	9	90	100	81
8	11	8	88	121	64
9	7	9	63	49	81
10	7	9	63	49	81
11	9	7	63	81	49
12	7	9	63	49	81
13	7	8	56	49	64
14	8	6	48	64	36
15	8	6	48	64	36
16	4	9	36	16	81
17	6	6	36	36	36
18	6	5	30	36	25
19	6	2	12	36	4
20	2	5	10	4	25
Sum	$\sum X=168$	$\sum Y=178$	$\sum XY=1639$	$\sum X^2=1580$	$\sum Y^2=1812$

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

$$= \frac{20 \times 1639 - 168 \times 178}{\sqrt{20 \times 1580 - (168)^2}\sqrt{20 \times 1812 - (178)^2}}$$

$$= \frac{32780 - 29904}{\sqrt{31600 - 28224}\sqrt{36240 - 31684}}$$

$$= \frac{2876}{\sqrt{3376 \times 4556}}$$

$$= \frac{2876}{3921.87} = 0.73$$

$$r_{tt} = \frac{2r_{xy}}{1+r_{xy}} = \frac{2 \times 0.73}{1+0.73} = \frac{1.46}{1.73} = 0.84$$

Appendix-F

Item analysis

R.n. Q.n.	Highest Scorer group 27% students														Lowest Scorer group 27% students						Total	P-Value	D-Value	Remarks
	1	7	5	3	6	2	9	4	13	12	8	11	10	14	18	17	15	16	20	19				
1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	0	0	1	16	80	0.33	Accepted
2	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	16	80	0.33	Accepted
3	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	16	80	0.50	Accepted
4	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	0	0	14	70	0.66	Accepted
5	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	0	0	14	70	0.66	Accepted
6	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	0	0	14	70	0.66	Accepted
7	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	0	0	14	70	0.66	Accepted
8	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	0	0	14	70	0.66	Accepted
9	1	1	1	1	1	1	1	1	0	1	0	0	1	0	0	1	0	1	0	1	13	65	0.50	Accepted
10	1	1	1	1	1	1	1	1	0	1	0	0	1	0	1	1	0	1	0	0	13	65	0.50	Accepted
11	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0	1	0	0	0	1	13	65	0.66	Accepted
12	1	1	1	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	0	0	11	55	0.50	Accepted
13	1	1	1	1	1	1	0	0	1	1	1	1	0	0	0	0	0	1	0	0	11	55	0.83	Accepted
14	1	1	0	1	0	1	1	1	1	0	0	0	0	0	0	1	0	1	1	1	11	55	0.33	Accepted
15	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	1	0	0	11	55	0.83	Accepted
16	1	1	1	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	0	0	11	55	0.50	Accepted
17	1	1	1	1	1	1	0	0	1	1	0	0	0	0	1	1	0	1	0	1	12	60	0.33	Accepted
18	1	1	1	1	1	1	0	0	1	1	0	0	0	1	0	1	0	1	0	1	12	60	0.50	Accepted
19	1	1	1	1	1	0	1	0	1	1	0	0	1	0	1	1	0	1	0	0	12	60	0.33	Accepted
20	1	1	1	1	0	1	0	1	1	1	1	0	0	0	0	0	0	0	1	0	10	50	0.66	Accepted
21	1	1	1	0	1	1	0	0	1	1	0	1	1	0	0	0	1	0	0	0	10	50	0.66	Accepted
22	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	0	0	10	50	0.50	Accepted
23	1	1	0	1	1	1	0	1	1	0	1	0	0	1	0	0	0	0	0	0	9	45	0.83	Accepted
24	1	1	1	0	0	1	1	0	0	1	0	1	0	0	0	0	1	0	1	0	9	45	0.33	Accepted
25	1	0	1	1	1	0	0	0	1	0	1	1	0	0	0	1	0	0	1	0	9	45	0.33	Accepted
26	1	1	0	1	0	1	1	1	0	0	1	0	1	0	0	0	0	1	1	0	9	45	0.50	Accepted
27	0	1	1	1	0	1	0	0	1	1	0	0	1	0	0	1	1	0	0	0	9	45	0.33	Accepted
28	0	0	1	1	1	0	0	0	0	1	1	1	0	1	0	0	0	0	1	0	8	40	0.33	Accepted
29	1	1	0	0	1	1	1	0	0	0	0	1	1	0	0	1	0	0	0	0	8	40	0.50	Accepted
30	1	1	1	0	1	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	8	40	0.33	Accepted
Total	27	26	26	25	24	23	19	19	16	16	16	16	15	14	14	13	12	11	8	7				
Rejected Questions																								
1	1	1	0	1	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	7	35	0.33	Rejected
2	0	0	0	1	0	1	1	0	0	0	0	0	1	1	0	1	0	0	0	0	6	30	0.16	Rejected

Note:

➢ Item Difficulty Level (P) = $\dfrac{No.\,of\ Students\ who\ got\ the\ item\ right\,(R)}{Total\ No.\,of\ students\ (N)} \times 100\%$

➢ Discriminating Index (D) = $\dfrac{R_U - R_L}{0.5 \times N}$ where ;

R_U = No. of students in the upper group who got the item right

R_L = No. of students in the lower group who got the item right

N= Total No. of students in the upper and lower group

P- Value Interpretation			
S.N	Criteria	Result	Remarks
1	0-39	Very Difficulty	Rejected
2	40-60	General	Accepted
3	61-75	Substantial	Accepted
4	76-90	Easy	Accepted
5	91-100	Very easy	Rejected

Source: Parajuli Dr. Tirtha Raj & Others (2067; p.166)

D- Value Interpretation			
S.N	Criteria	Result	Remarks
1	-1 - 0.19	Negligible	Rejected
2	0.20 - 0.29	General	Accepted
3	0.30 - 39	Good	Accepted
4	0.40 - 1	Very good	Accepted

Source: Parajuli Dr. Tirtha Raj & Others (2067; p.168)

Appendix-G

Correlation Coefficient between Independent and Dependent variables

Appendix-G1

Correlation coefficient between mean of participation level as involvement

in homework/classwork and mathematical achievement

mean of participation level	mean of mathematics achievement	Cor.Coeffi.
2.7	17.32	
2.2	14.71	0.756
1.4	13.54	

Appendix-G2

Correlation coefficient between mean of participation level as interaction

with adults/elders and mathematical achievement

mean of participation level	mean of mathematics achievement	Cor.Coeffi.
2.8	11.26	
1.2	16.35	0.102
2.4	14.53	

Appendix-G3

Correlation coefficient between mean of participation level as learning

environment and mathematical achievement

mean of participation level	mean of mathematics achievement	Cor.Coeffi.
3.0	17.45	
2.6	15.60	0.831
1.9	12.82	

Appendix-G4

Correlation coefficient between mean of participation level as regularity in school and mathematical achievement

mean of participation level	mean of mathematics achievement	Cor.Coeffi.
2.9	17.15	
2.5	15.48	0.532
1.6	13.26	

Appendix-G5

Correlation coefficient between mean of participation level as interaction with peers and mathematical achievement

mean of participation level	mean of mathematics achievement	Cor.Coeffi.
2.7	14.98	
2.1	15.50	0.225
1.5	11.43	

Appendix-G6

Correlation coefficient between mean of participation level as interaction with subject teacher and mathematical achievement

mean of participation level	mean of mathematics achievement	Cor.Coeffi.
2.9	16.28	
2.3	14.25	0.426
1.3	12.56	