

**LEARNING STRATEGIES OF STUDENTS FOR MATHEMATICS AT
SECONDARY LEVEL**

**A
THESIS
BY
KAMAL POUDEL**

**FOR THE PRACTICAL FULLFILLMENT OF REQUIREMENTS FOR THE
MASTER DEGREE IN MATHEMATICS EDUCATION**

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Letter of Certificate

This is to certify that Mr. Kamal Poudel, students of Academic Year 2070/071 with Exam Roll No. 280434, Thesis 1294 and Registration Number 9-2-559-124-2009 has completed his thesis under supervision of Mr. AbetarSubedi for the period prescribed by the rules and regulation of Tribhuvan University, Nepal. The thesis entailed “ Learning Strategies of Students for Mathematics at Secondary Level” has prepared based on the result of investigation conducted during the period of January, 2017 to may 2018 under the Department of Mathematics Education, Tribhuwan University, Kathmandu. I recommended and forward that this thesis be submitted to award the Degree of Master of Education.

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June, 2018

Letter of Approval

A

Thesis

By

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Entailed

Learning Strategies of Students for Mathematics at Secondary Level

Has been Approval partial Fulfillment of the Requirements for the

Degree of Master of Education

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I recommended this thesis for approval by the research committee.

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June, 2018

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Dedication

This work is dedicated to my father Mr. Tilak Ram Poudel,

Mother LaxmiPoudel

Declaration

I hereby declare that this Research entitled “learning strategies of students for mathematics at secondary level”. A Study of Bagnanga Municipality of Kapilvastu District has been prepared me under the closed guidance and supervision of Mr. AbatarSubedias a guide in the partial fulfillment of the requirement for the degree of master in education at University campus, Department of Education, Tribhuwan University, and Kathmandu, Nepal. This research work has been entirely prepared by me under the closed guidance and supervision. The finding of this thesis have not been presented or submitted anywhere else for the any other purpose. I assure that no part of content of this thesis has been published in any

.....

Kamal Poudel

June, 2018

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Abstract

This study is to investigate learning strategies use of “learning strategies of students for mathematics at secondary level” students for mathematics at secondary level. However, learning strategies change the learning way with the development discourse and practice is not analysis academically. Students used learning strategies to study mathematics to change learning behavior and make the easier effective learning.

In the context, the general objective of the study was explained most preferred learning strategies and compare with respect to boys and girls students. The study was purposively selected Bananga Municipality, in Kapilvastu district. This study followed descriptive research design primary and secondary data and information. The researcher were selected four public school and 400 students keeping 25% sampling target, 100 students were interviewed randomly considering number of the boys and girls students propositionally at the secondary level. The researcher used questioner 41 items under two learning strategies and interview conduct the same question to ask same students 10 students were expected to involve the questioner and key of interview information to ask the teachers semi-structured for the justification.

The finding of this study was strong since most of the student’s preferred learning strategies and in compare girls students were used learning strategies than the boys students. Additionally, most of students use of the learning strategies for study mathematics was the effective learning and to develop the foundation and self confidence while learning mathematics.

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Abbreviations

LD = Learning disabilities

FD = Field Dependent

FI = Field Independent

MSLQ = Motivational Strategies for Learning Questioners

Chapter I

Introduction

Background of the Study

Learning is the acquiring new or modifying existing knowledge, behavior, skill, values and may involve synthesis different strategies of the information. Human learning may occur as a part of the education, all round development, schooling and training. Effective learning requires control over their learning process and know how, when, and where to use various learning strategies.

Wang (2002) has described showed that students used to more learning strategies and more frequently used skilled to help learners to facilitate own learning style. Most of the students from different background they have different style and skill to learn mathematics so all students need the ability to be able to build further on their knowledge after compulsory schooling. Hence, this aim is intended to help the student maintain and develop his or her excitement for learning mathematics as well as the capability to do.

Students used to more learning strategies and more frequently used skilled to help learners to facilitate own learning style. Most of the students from different background they have different style and skill to learn mathematics so all students need the ability to be able to build further on their knowledge after compulsory schooling. Hence, this aim is intended to help the student maintain and develop his or her excitement for learning mathematics as well as the capability to do Wang (2002).

The aim of this study is in what type of learning strategy most preferred while learning mathematics and to look at student's attitudes towards studying in mathematics, students choose to study and how that correlates with their learning and Learning styles while learning mathematics. Secondly, the researcher wish to

investigate some possible development in students' understanding of their learning and learning style mostly preferred regarding the type of learning strategies they choose to study mathematics by gender.

Additionally, Teachers to help the student learning better and to see how school can promote learning in mathematics among its students, how the student usage of learning styles within the classroom and at home while learning mathematics. Behaviors of students that are intended to influence how the learner processes information and to get insight into how students to study the problem of mathematics, looks at what type of setting and develop the skill of the new information students choose to in when they do and remembered it (Weinstein and Mayer 1988).

Each of the students has individual learnt differently and that school can help the students' results by adapting the teaching to each student's learning style and perceptual preference. This study focuses on most of the student's mostly preferred learning strategy to solve the mathematical problem. When, where and why a student chooses to study is of importance and can affect the studying outcome. To get insight into how students to study the problem of mathematics, this study looks at what type of setting students choose to in when they do not study in school and at home. It also examines students' attitudes. The study also discusses how learning style-based learning can help teachers in their work effectively.

However, general understandings of learning strategy are tactics, ways and methods for the achieving the better knowledge about any particular subject matter. It is not only about the mathematics rather about the better learning and achieving the result either it is associated with the theoretical aspects or practical aspect. The learning strategy is a particularly relevant to current curriculum reform in the

mathematics education. Broadly, learning strategies refer to the student's self-generated, thought, feelings, understanding and actions which are systematically oriented towards achievement of the goals. Learning strategy is an individual's approaches to solve the task properly i.e. how the student uses and organizes set of skills to learn content or to complete a different mathematics tasks more effectively and efficiently either in or out of the school. It is essential in mathematics education because it helps to the students to learn and achieve the knowledge with short and sweet ways systematically about the solution of the mathematics problems. The Learning strategy gives to the students a way to think, articulate and plan the solution for the mathematical problems.

The Learning strategy is a way of different approach of the learning. It helps to improve learner's quality for better understanding. Curriculum should be relevant or it should be designed according to the students need, interest, and market as well. The curriculum should be focused on practical perspectives it can be helps the students using the knowledge day to day in the relation of mathematics. A logical skill and thinking is basically needed used for the quality learning because those things increase creativity and generate the new idea in the student's mind to solve the mathematical problem.

The learning strategy is the essential of the learning process. The learning strategies are behaviors and thoughts affecting the learners' motivation or affecting state or the way in which the learners select, acquire, organize and integrate the new knowledge. This is an important factor of the learning strategy is research in mathematics education. The learning strategy helps to the students to develop the skills, technique for generalizing, analyzing, organizing and finally to solve the mathematical problem, and to get the success in mathematics.

Different kinds of the students different types of the learning strategies preferred and take the benefit from the favorite situation such as some of the Students preferred enjoy reading, note making, images, charts, diagrams and watching demonstrations, talk about what things looked like and don't like listening to long explanations, talks or lectures. Some of the students preferred like listening to explanations, speaking and learning by repeating, recall and often distracted by noise and need quiet, although some students like background music. Teacher think identified which is the best learning style student's preferred while learning mathematics, it's time to get creative with the way teacher help them learn. Everyone students has more through their own learning style than that of the teacher and if students' learning styles and preferences are agreeable they are more likely to perform successfully. The differences between learning styles within students of a group are as varied as those students between groups since everyone students comes from different society, different backgrounds. Some of a student's learning style is genetic, which means that it is based on psychology, and stamina. The remainder is learned behavior. A learning strategy builds on a person's learning style and can be altered.

Mathematical learning strategy refers to person ability to person ability to reason, solve the problem and learning visual information. Mathematical logic used typical style. They may be used solved the mathematical problem by logic puzzles and game. The learners have mathematical logic learning strategy to enjoy school activities such as math.

The research based on the learning strategies use on the mathematics learning based on the factor analysis and it comprehensive approach to how students preferred

to function, learn concrete perform during educational activities in the following area such as for rehearsal, elaboration, organization, critical thinking, and meta-cognitive self-regulation etc it had been thoroughly evaluate at all level of the educational system. In this study forty one learning strategies were taken as the depended variable and the final its variable find out the what types of the learning strategies were most preferred of them factor of learning strategies.

Statement of the Problem

The learning strategy has been considered as one of the instruments for better learning. It systematizes to learning process. It means it is for better result. Theoretically, it has been taught, studied and discussed but how much is it practiced at ground level is important. The students have been using the learning strategies knowingly or unknowingly. Teachers are also familiar with the various learning strategies but how much they encourage to the students to adopt the learning strategies for better result.

Furthermore, researchers were studied the ways in which learners perceive learning strategies and how these perceptions impact learning. However, most studies have focused on teaching styles learning strategies. Moreover, these studies have not examined secondary school students' perceptions of educators' teaching styles learning strategies. Even though researchers have also been interested in the use of learning strategies and have suggested that students can benefit from effective learning strategies, research has not reported on the literature suggesting that the majority of secondary school students are taught to use various learning strategies. The secondary school students' perceptions of learning strategies influence their own strategy use. Students 'use of strategies to make connections across learning experiences. Therefore, this should be studied academically as a research.

The study was mainly focused on investigating the following researchable questions:

-) What kind of learning strategies do the students use mostly to tackle mathematics problem tasks?
-) Is there a difference between male and female students in their preferred learning strategy?

Significance of the Study

The learning strategies create the good and active learning environment. Students keep their interest on the study continuously if they follow the various learning strategies. Mathematics is the widely subject in our daily life. Most of the students fear in the mathematics and feel that it is the hard subject. Most of the students failed in the mathematics show the result. Maximum number of the girls student fear in mathematics than boy students, but in use the effective learning strategies while learning mathematics maximum number of the students interested to take the mathematics subject and achieve the equal number of the students and maximum students have passed in mathematics. In this content researcher studied mostly tackle or use of the effective learning strategy for the purpose most of the students interested mathematics subject.

The significances of the study are follows;

-) This study would help students become strategic learners, educators should be aware of a student's learning strategy use and have flexible teaching styles learning strategies.
-) This study would help the results of this study can be used to provide secondary school teachers with the knowledge that students may approach learning in different ways.

-) This study would help the knowing how students perceive teaching styles may help educators see their role from a different viewpoint and understand the importance of reflecting on as well as adjusting their teaching styles learning strategies.
-) This study would help by gaining an awareness of students' strategy use, teachers may realize that it is important to teach various learning strategies according to specific needs.

Objectives of the Study

The objectives of the study are given below:

-) To identify the most preferred learning strategies in mathematics students at secondary level.
-) To compare most preferred learning strategies of the students in mathematics with respect to gender (male and female).

Delimitation of the Study

This study was found out the learning strategies of students in mathematics.

-) The study was to identify the most preferred the various learning strategies in learning mathematics.
-) This study only focused on the secondary level students.
-) The study was delimited to secondary level of public school students who volunteered to participate in Bagnanga Municipality of Kapilvastu district.

Operational Definition of Related Terms

The researcher define the related terms such as more consistent and clear way, however definition must be based on theory that is generally recognize as valid.

Researcher defines the following related terms:

Learning Strategies.This can be defined as learners' behaviors that are intended to control and regulate their own cognition and can be used for - the processing of information and controlling other resources besides their cognition.

Mathematics learning strategies.Basically, mathematics learning strategies are steps taken by students to enhance their own mathematics learning. A more detailed explanation of mathematics learning strategies, shown earlier in this chapter, indicated that these strategies are specific methods or techniques consciously used by individual learners to facilitate the comprehension, retention, retrieval and application of information for mathematics learning and acquisition.

Public school.Public schools are those schools which are conducted by government and community.

Strategy.A detailed plan for achieving success in situations such as war, politics, business, industry or sport," and, of course, learning. Thus, playfulness or goal orientation is an essential part of any definition of "strategy."

Chapter II

Literature Review

This chapter deals with the review of the related literature and the framework of this study. The theoretical literature is for understanding of theoretical learning strategies. It follows with theoretical ideas about the different learning strategies, empirical literature review of national international article review.

Empirical Literature Review

Mathematics staff (1995) conducts the research on the topic “learning style in the mathematics classroom” with the object to investigate the different learning style of the students in the classroom and to introduce a single-sex and mix- sex experience mathematics class experience for all students.

The researcher sample was made up of 64 students from the secondary school of the farming community group. The researcher sample was divided into the three groups. Firstly group was mixed-sex group, taken few numbers of the boy students and few numbers of the girl students the total numbers of the students was 23. And the next group was taken single-sex group means 22 number of the only girl students. And last group with the 21 number of the only boys students. The researcher conducted the 8 years long. The researcher set the questionnaire of the two types of the learning and teaching style with the parallel mathematics achievement test. Field notes were collected from discussions between the researcher and students, teachers and parents. No formal interviews were conducted, though some notes were collected from conversations had at Parent teacher interviews and from mathematics faculty meetings and conclusion are find out.

Separate style: students develop their knowledge separately from others, using a set of impersonal rules, through which they objectively and critically sort given information

filtering out any subjectivity. These people exclude feelings and students beliefs to develop their knowledge objectively. Their learning attempts to separate the knowledge from the source of knowledge so as to evaluate the knowledge itself.

Connected style: Student was to develop their understanding from the perspective of the each other. These students prefer to connect with the students and try to understand her/him and their subjectivism and the way they formed their knowledge as well as their knowledge. These individuals trust knowledge that comes from personal experience rather than being handed down from authority. They value learning and knowledge that is woven into their student's relationships, surroundings and environment. These people do not try to view knowledge as cold and impersonal but try to include the emotion and personality of the knower and see this as adding to the knowledge rather than detracting from it. Their knowledge of truth develops through care for others and their relationships with others.

Morrow (1996) and Becker (1996) suggested a different picture of mathematics teaching is starting to emerge, where teachers encourage students to make connection with their own experiences and the experiences of others. Morrow (1996) contends that many connected learner (particularly girls) in mathematics spend much of their time listening to the ideas of others. She suggests that if connected learners are to gain a sense of their own voice in mathematics then teachers need to give them opportunities to verbalize their mathematics knowledge. It is through such discussion that students form, modify and develop their thoughts into ideas. For students who prefer to learn as connected learners, the support of small groups and the role of hypothetical and tentative talk are important, almost essential, in the development of their ideas and understanding.

Additionally, observation of the teachers' classes and from conversations with them the teachers found they changed their teaching methods to reflect the style preferred by the students. The single-sex boys' class was taught in a very traditional and separate knowing way with the boys learning in a very individualized and independent way. In this class students responded well to games and competition in their tasks, where the completion of the task required boys to work on their own. In the single sex girls' class, it was observed that the girls formed small learning groups based on the tables where they sat. Their learning was a sharing process with lots of discussion and developing of ideas in a connected way. Whenever they were given the opportunity the girls would form small groups, discuss their learning and share their ideas. They always sought connection with each other. It was found to be too ineffective to teach the girls in the more traditional way. Boys in the single-sex class disliked group work and it was found to be very difficult to get boys involved in discussions of their understanding of mathematics.

Finally, this study suggested that of all mathematics staff that to teach the learners according to the students behavior and own learning style of the students. Girls and Boys students they cannot prefer same learning style and different capacity to learn girls students than the boys students. Most of the girls students preferred the learning style in the small groups, discuss their learning, share their ideas and connection with each other. Most of the boys interested to gain the knowledge by the playing games and individualized and independent way. So the research concluded that different learning and teaching style applied in the suitable condition for the learner's, it is the meaningful learning and teaching sector.

Skelto (2005) "learning style, strategy use, and personalization of mathematical word problems on the selection of appropriate operations and the

execution of correct computational responses by students with learning disabilities” with the primary purpose of this study was to examine the effects of learning style, strategy use, and personalization of mathematical word problems on the selection of appropriate operations and the execution of correct computational responses by students with learning disabilities (LD).

Additionally, the secondary purpose of this study was to determine if learning style, strategy use, and personalization of mathematical word problems interacted with mathematical word problem achievement levels to effect students with learning disabilities selection of appropriate operations and execution of correct computational responses. The researcher selected eighteen elementary schools which have high level of achievement from a larger urban area. The researcher had been selected 144 male students with the learning disability (LD). These students were classified as having a learning disability.

Six instruments, three commercial and three researcher-developed, were used to collect data. Subjects were individually tested using the WJ-R Applied Problems and Calculation Subtests. These subtests were selected because of high validity, reliability, and ease of administration. The WIAT Listening Comprehension Subtest was also administered individually to all subjects. This subtest was chosen due to its comprehensive nature and simplicity of administration. Next, the CEFT was administered individually to determine whether subjects exhibited more field-dependent (FD) or more field-independent (FI) characteristics. The CEFT was selected because of its validity, reliability, and ease of administration. Finally, three researcher-created instruments were administered to the subjects. The first instrument was the MWPPRE, comprised of 12 mathematical word problems incorporating the four operations in the following manner: three additions, three subtractions, three

multiplications, and three divisions. The second instrument was the MWPPPOE. This instrument was also comprised of 12 mathematical word problems using the same operations as described above. A panel of professionals with expertise in mathematics and LD reviewed the researcher-created instruments to determine face and content validity. Reliability of the two researcher-created instruments was determined using SPSS Cronbach Alpha procedures. The third researcher-created instrument was a Biographical Inventory. This inventory was used to ascertain names and situations that were familiar and enjoyable to the subjects. The Biographical Inventory was completed cooperatively by the subject and a professional in the school. The results of this inventory were incorporated into the mathematical word problem personalization experimental condition problems. The questions contained in this Biographical Inventory were patterned after information used in similar studies using personalization as a factor, after the analyzing and interaction the obtain data the result of this that learning style, strategy use, and personalization of mathematical word problems did not interact to effect the selection of appropriate operations and the execution of correct computational responses for students with LD.

Elin (2009) "Learning Styles and Reading" he has master degree of the Humanities and Social Sciences. It was a project work from the social science abuts the English language. Her contribution or research finding there are three learning style and how an individual works cognitively, affectively and physiologically. A learning style is therefore an expression of the individual's whole personality; it is primarily biological and consequently difficult to change. Everyone learns more through their own learning style than that of the teacher or the tutor and if students' learning styles and preferences are accommodated they are more likely to perform successfully.

The differences between learning styles within a group are as varied as those between groups since everyone comes from different backgrounds. Over three-fifths of a person's learning style is genetic, which means that it is based on psychology, physiology and stamina. The remainder is learned behavior.

Cognitive strategies; it based on problem solving and analyses which the learner applies to the language he/she has already learned. Translation is an example of a cognitive strategy. Meta cognitive strategies; It require that the learner plan, organize, monitor and evaluate student's learning process. These strategies help divide the learning process into smaller parts. Social strategies; it involve using your surroundings for learning purposes. For example, one can ask a teacher or a speaker for (language) help and working with others when learning is another example.

Ya-Ching Chang (2010) conducted a research on "Students' Perceptions of Teaching Styles and Use of Learning Strategies" with objectives to describe the use of learning strategies in mathematics, to identify teaching style of junior high school teachers, as perceived by students and to investigate relationship between the teaching styles perceived by students and students' own use of learning strategies to promoted for effective mathematics learning. This is the qualitative study related the students learning. For this responded with the students by the questionnaire. The collected the data were analyzed according to the motivated strategies for learning. The researcher concluded that students tended to use learning strategies that enabled them to use study hours well and choose environments that could facilitate learning and helped them. Students may not receive resources to get a task of mathematics for learning strategy instruction that fosters effective use of strategies and enables them to develop personal learning strategies. Students' perceptions of teaching styles may not have a strong effect on their own strategy use but on other learning outcomes.

Dongal (2012), carried out a case study on “cause of failure in mathematics” with objective to identify the cause of failure in mathematics and to promote the strategies taken by school to promote mathematics achievement. This study was concluded with the same 30 student of grade X chosen purposively. According to the performance in mark obtained of 2067 in Nuwakot district. The data was collected direct interview class observation regularly for three times during teaching learning activities. The research concludes that achievement is always affected by different variable such as school learning environment, facilitates at home and school.

Sharma () conducted the research on the topic “correlation of the learning style with their mathematics achievement score” with the objective to investigate correlation between learning style of student and their achievement score of boys and girls student. Out of them 54 were public schools in Myagdi district. She selected 10 schools consisting 5 private schools representing from urban area and 5 public schools representing from rural area. Sample of the study was all students of grade nine of the selected study. The researcher set the question from the various learning styles such as environmental learning style 12 items, emotional learning style 15 items sociological learning style 17 items and physiological learning styles 20 items questions. The environmental learning styles deals with the environment factors in determining the how students learn. Environment includes sound, light, temperature and deigns (seating). Emotional learning factor included that the motivational, persistence, responsibility and structure. Thirdly, sociological factors deals with the along, peer team and adult. And last the learning style included that auditory, visual, tactile etc.

The researcher concluded that by the obtain data students have been using different learning styles while learning mathematics. Moreover, the researcher found that there is no significant different between learning style and their achievement

score of mathematics of the grade nine students. The learning styles and the achievement score of the grade nine students are highly correlated and both of them had a great role to establish the effect and correlation between them. But the matter about their relationship is found that to be high. At last the researcher found that high degree of the relationship.

Theoretical Literature Review

The theoretical framework guide and integrate the research study. It is the wider of the research study. It helps the researcher how to identify in the research problem. The study is the learning strategies on the secondary level in mathematics. Deepen on the motivational learning strategies by the Pintrich, Smith, &McKeachie. It is multidimensional factor reliable and valid instrument. So it has following theoretical construction.

Effective learning requires students to take control over of their learning process and know how, when, and where to use various learning strategies. Many researchers have studied what learning strategies are, but a universal definition of learning strategies is not available. Learners differ in their skill at using learning strategies. In short, students approach learning in different ways. Some students possess a wide range of learning strategies and can use them flexibly. However, some students have trouble learning because they lack effective learning strategies for completing a task. Effective learners have a better awareness of strategies that are necessary to help them learn.

Motivated Strategies for Learning:Motivation is grounded within various theoretical frameworks. Within the learning process, motivation is generally concerned with the learner's internal drive to success in academic tasks, and is often termed achievement motivation. Research for achievement motivation focuses in

explaining why a learner chooses, expends effort, and persists on learning. The Learning Strategies Section includes two Components: A cognitive and meta-cognitive strategies component which includes scales for rehearsal, elaboration, organization, critical thinking, and meta-cognitive self-regulation; Rehearsal: Rehearsal is considered a simple learning strategy. Stores information to be learning into working memory through processes of naming, repeating, and reciting material for learning. Reflects students' use of strategies to recall and repeat learning material. Elaboration: Elaboration is a learning strategy in which a learner paraphrases or summarizes learning material to help the individual understand the material. This strategy is intended to build internal connections between one's prior knowledge and the new material.

This strategy is considered a higher order learning skill because the strategy allows learners to store learned information into long-term memory. Include summarizing, information and putting idea into one's own words. Organization: Organization, a higher order learning strategy, involves methods of outlining, taking notes, mapping or connecting key ideas in learning material (Weinstein & Mayer, 1986). Critical Thinking: Critical Thinking is a higher order learning strategy which involves applying learned information to knowledge of new situations, i.e., relating subject matter to be learned to one's prior, personalized knowledge. Reflects how learners question or analyze statements and concepts learned in class. Meta-cognition: Meta-cognition refers to how one thinks about thinking, it encompasses methods of a learner's awareness and knowledge of their cognitive processes. Concerns how students set learning goals and monitor/regulate the learning process. The resource management strategies include four scales.

Resource management strategies component: It includes scales for time and study environment, effort regulation, peer learning, and help seeking. Time and Study Management: Time and study management involves choosing environments that are conducive to learning (i.e., free from distractions) and effectively scheduling, planning, and managing one's study time. Refers to strategies students use to manage their time and learning environments. Effort Regulation or Management: The effort a student expends to reach his or her learning goals is termed effort regulation. Effort regulation enhances the ability of the learner to handle setbacks and failures within the learning process by correctly allocating resources and appropriate effort to increase more successful learning in the future. It reflects student's commitment to achievement their learning goals even when there are difficulties. Peer Learning: Peer learning involves using peers (friends, classmates, etc.) to collaboratively understand course material or information to be learned. Includes strategies students use to work with their friends and classmates. Help Seeking: Help seeking can be an adaptive learning strategy that allows a learner to optimize learning by seeking help from local resources such as instructors, peers, tutors, or even additional textbooks. Involves how students seek assistance from their teachers and classmates in the learning process.

Understanding students' and use of learning strategies: Teachers need to be aware of the strategies adopted by their students. This awareness allows teachers to design and implement learning strategy instruction and helps teachers raise their own awareness of strategies used by students. The teacher is a crucial factor in helping individuals develop effective learning strategies and become strategic learners. By knowing students' use of learning strategies, the teacher can recognize learners' strengths and weaknesses and adjust instruction accordingly.

Teachers would be able to teach individual students to use learning strategies appropriately and effectively if they identify and accommodate the strategy use of students in relation to their genders and their learning abilities (Pressley, Goodchild, Fleet, Zajchowski, & Evans, 1989).

Increasing teachers' awareness of students' strategy use can lead to successful learning and teaching. It is possible, though, that teachers are not sensitive to student learning or make incorrect assumptions concerning learning strategy use (Arabsolghar & Elkins 2001).

If teachers overestimate or underestimate students' ability to use learning strategies, they may have problems identifying learning difficulties experienced by their students, and thus fail to provide appropriate learning assistance. In turn, this would impede student learning. To provide a strategy instruction that is beneficial to students from diverse backgrounds, teachers should know the use of learning strategies by learners (Protheroe, 2002).

According to Lenz (2006), it is very important for educators to pay attention to strategy use. He suggested that educators needed to ensure that their students could select and apply the effective learning strategies that they were taught in the class.

Martin (2005) agreed that understanding what strategies students used in the classroom was important. As she pointed out, every teacher has had ineffective or less capable students in his or her classrooms. She indicated that teachers could use this information to address students' ineffective use of learning strategies. This information enables teachers to incorporate appropriate teaching of learning strategies into the content area curriculum.

Learning strategies research has varied factors, such as reading, mathematical problem solving language has shown that the ability to select and use appropriate

learning strategies and the ability to monitor and control the learning process are characteristics of successful students. In contrast, less able students have been characterized as either not having effective strategy in their repertoire or not employing them at appropriate times (Weinstein and Mayer, 1986).

Constructivism in the Learning of Mathematics

The main support theory of the learning mathematics is effective in learning the theory of constructivism suggests that learners construct knowledge out of their experiences. However, constructivism is often associated with pedagogic approaches that promote active learning or learning by doing. It is related social constructivism or cognitive constructivism. It was developed by L.S. Vygotsky (1886 – 1930). He developed socio-cultural theories. He noted that notion of the "zone of proximal development" (ZPD) is Vygotsky's term for the range of tasks that a child is in the process of learning to complete.

Vygotsky viewed the ZPD as a way to better explain the relation between children's learning and cognitive development. Prior to the ZPD, the relation between learning and development could be reduced to the following three major positions. First, development always succeeds learning (e.g. constructivism) children first need to meet a particular maturation level before learning can occur. Secondly, Learning and development cannot be separated but instead occur simultaneously (e.g. behaviorism) essentially, learning is development and last third learning and development are separate but interactive processes (e.g. gestaltism).

He claimed that one process always prepares the other process, and vice versa. He rejected these three major theories because he believed that learning should always precede development in the ZPD. According to Vygotsky, through the active contribution to the fulfillment of need of an effort or purpose of a more capable

person. Student is able to learn skills or aspects of a skill that go beyond the child's actual developmental or maturational level.

The lower limit of ZPD is the level of skill reached by the students working independently and also referred to as the student's achieved actual developmental level. The upper limit is the level of actual skill that the students are able to reach with the help of a more capable teacher. In this sense, the ZPD provides a prospective view of cognitive development, as opposed to a related view that characterizes development in terms of a student's independent capabilities.

It was a important way for learning. Students learn something and solve their problem independently from the society by the interaction. But some problem support by the others. Students get the skill to solve using own their mental power. The knowledge developed by the social interaction and interconnects with the ZPD. It means students solving the problem own capacity or support by others. The exactly meaning of the ZPD means different between dependent task and independent task completed. It obtained by the social interaction.

In the constructivism, Piaget argued that the knowledge is actively gained by the response and actively interaction with environment stimuli. But Vygotsky claimed that the knowledge gained by the social interaction, human experience and commutation each others in the society. So knowledge is not getting easily. The main different between Piaget and Vygotsky is that Piaget claimed that children go through set stages of cognitive development and Vygotsky believed that cognitive development is continual. But both beloved that or focused on child development.

Must of the students construction the knowledge through the watching others like visual and interrupting that the information into his / her schemata. Students are using the learning strategies or solving the mathematics problem by the generated the

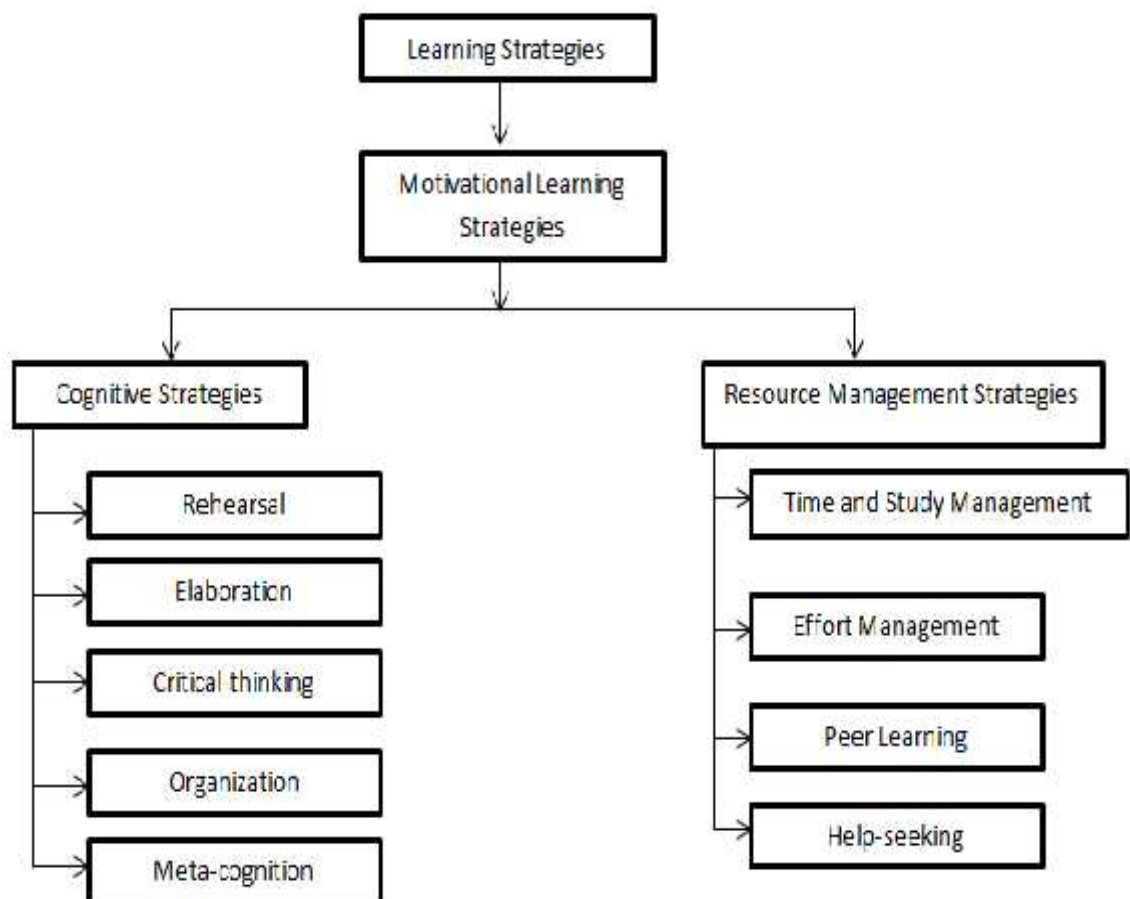
new ideas by the through real life. It is effective for learning. Social interaction exist the knowledge on multiple. It can be take in the classroom or at home. Social interaction occurs between interact by the students, teachers, parents and other generated the idea with the environment and using the study for effective. It support that all form of the social interaction and experience are equally important in the students' intellectual development.

Constructivism plays the important role in learning and teaching mathematics. Because in teaching teachers plays the most important chance to students for interact with the various environmental process and social environment to learn mathematics. Students must help or develop the capacity to using different types of the strategy while learning mathematics. For this teacher should to help or guide only. Students generate the new idea by the social activities related mathematics freely in home, school and society to help them to solve the problem.

Thus, this study tried to find out the learning strategies of the secondary student's of the Bagnanga Municipality of Kapilvastu and the high mean value score of the factors of the learning strategies. The most preferred of the learning style. The tools of this study were also constructed with the help of above theoretical construction.

Conceptual Framework

A conceptual framework can be considered as a map or a travel plan a conceptual framework is a representation, either graphically or in narrative form of the main concepts or variables, and their presumed relationship with each other (Punch, K.F. 2005). For this study the conceptual framework devised through the literature studies facilitated to attain research objectives, get answer of the research questions and carry out the research work as a whole smoothly. Analyzing various literatures in relation to early development of algebraic thinking relevant theory, I have developed a conceptual framework which would be support to this research study.



Source: (Pintrich, Smith, &McKeachie, 1989)

This conceptual framework would be helpful to construct research tools and design use of learning strategy in the mathematics classroom. It shows that the mathematics learning strategies in the effective learning strategies and the use of the learning strategies. This included cognitive learning strategies and the motivational learning strategies.

It would be develop the learning skill and know how, when, and where to use various learning strategies for effective learning mathematics in school, home and others. It was based on the MSLQ developed by Pintrich, et al. (1989).

Chapter III

Research Methodology

This chapter describes the design of plans and procedure of the study which is carryout to achieve the objectives of the study. Methodology presented the logistics of the study because it determined how research becomes a complete and synthetic. This chapter presented separate headings such as design of this study, population of the study, sample and sampling strategy, data collection tools and techniques, data collection procedures, data analysis and interpretation procedures.

Research Design

The research design of this study was descriptive research type. The researcher followed quantitative approach for assessing the mathematics learning strategy, adopted by secondary school level student.

Source and Nature of Data

The study was based on both primary and secondary data sources. The researcher used both primary data and secondary data and information. For the primary data, the researcher used Questionnaire Survey and KII. Similarly, the researcher used intensive literature review; published/unpublished articles, reports of government, different organization working in education sectors, and Master's dissertations to generate the strong base for the argument of learning strategies.

Population and Sample

The random sampling technique was used. The four public schools were selected purposively. The total number of secondary student was about 400. Keeping 25% sampling target, the 100 students were interviewed randomly considering number of girl students and boy students propositionally.

Tools

Development of tool is very important in order to collect the required data. In order to containing the Motivated Strategies for Learning Questionnaire, student's learning strategies Questionnaire, and interviews conducts the same question to ask the same students for the justification of the response of the response of the questionnaire. Research Technique and Tools

For this study Questionnaire Survey and Key Informant Interview were the main tools of the study. To get the appropriateness in the Nepali content the questioner prepared the researcher. The items of the questioner were prepared such as to find out the most preferred learning strategies while learning mathematics. The questioner included item related to the learning strategies which were factor of the cognitive learning strategies and the motivational learning strategies. The questioner consist of the 41 item under the two learning strategies, the interview conducted the same question to asked the same students and Key of interview information to asked the teacher semi-structured for the justification.

Questionnaire

Researcher used research tool – questionnaire guided by questionnaire guideline- motivated strategies for students learning strategies questionnaire (Pintrich, Smith, &McKeachie, 1989). Therefore, in each school the researcher will make students fill up questionnaire making them participant. The students of class 9 and 10 will be made to collectively involve in questionnaire fill up task. At least 10 students are expected to involve in questionnaire fill up task. The questionnaire is formulated to generate data from the students about the various learning strategies under taken by the students.

Key Informant Interview

The researcher used the KII as well to generate primary data. Primary, the KII was used to triangulate the information for maintaining the validity of the information. The research did KII with principal and subject teachers of selected school following the semi-structured KII guideline. Basically, the KII aimed to explore the information about what kind of learning strategies are followed by the students during class and home.

Data Collection Procedure

The Researcher took the permission from the principal, subject teachers, and students to do the research activities. Researcher collected the data from the selected school and with the help the school's administration to complete this study.

Data Collection Process

Data and information was generated using various research tools and technique. To generate the data and information, the researcher was gone research field. The researcher was selected the school from the list of Pubic school provided by DEO. The researcher was conducted questionnaire fill up task at the school with participation of the student.

Data Analysis Process

A quantitative approach was used in the study. In order to answer the research questions, the data from the questionnaires was analyzed with the aid of statistical analysis software (SPSS). Generally, the quantitative data was presented using high mean score and interview of the mathematics teachers.

The collected data and information was analyzed following the various processes. Particularly, gained data and information was analyzed. Moreover, the students' most use of learning strategies the frequency used by mean and gender was

examined by using total mean score of strategies students used, the most and to determine whether there was difference in the most frequently used strategies between male and female students.

Chapter IV

Data Analysis and Interpretation

This is a descriptive research related to the student's learning strategies in mathematics, at secondary level. The major focus of the study was preferred learning strategies in mathematics students and to compare the boys and girls. The study aimed to find the most preferred learning strategy in mathematics at secondary level. In the study, the data was collected from 100 students of five different public schools with the help of the questionnaire. The collected data were classified, tabulated and analyzed according to the objectives. The obtained data were analyzed and interpreted using the tools such as frequency, high mean score, percentage and the data from the interview schedule were analyzed by using qualitative techniques and interview by the teachers for the justification. An individual student's scores on each of the nine scales of the motivated Strategies for learning questionnaire were obtained by calculating the mean of item scores in each scale. The scale with the highest mean score indicated a student's most frequently used learning strategies.

The findings gained from the questionnaire and KII with the students and teachers respectively organized orderly. It means first, of all the individual analysis for each component of motivational learning strategies are analyzed. Secondly, comprehensive analysis of the learning strategies was analyzed by comparing components of both learning strategies i.e. cognitive and resource management strategies.

Learning Strategies

The researcher used MSLQ method for analyzing the mostly used learning strategies while learning mathematics in secondary level.

This learning strategy MSLQ is the self-reporter instrument that developed to measure students' motivational orientation and use of the learning strategies. The motivated strategies for learning questionnaire were used in the present study to identify learning strategy use of secondary level school students. The learning strategies section of the MSLQ contains two categories with 43 items. Cognitive Strategies include five scales: Rehearsal (4 items), Elaboration (6 items), Organization (4 items), Critical Thinking (5 items), and Meta-cognition (10 items). The category of resource management strategies includes four scales: Time and Study Management (5 items), Effort Management (3 items), Peer Learning (3 items), and Help-seeking (3 items). Each item represents a statement concerning the use of learning strategy. Students respond to the items using a 5-point Likert-type scale, ranging from 0 Strongly Disagreed, 1 Disagree, 2 Undecided, 3 Agree and 4 Strongly Agree Some negative items are reverse-scored. For these items, any scale score was calculated by taking the mean of the responses to all items in the particular scale.

A category score is determined by calculating the average value of all responses for the items in the category. Each mean score is associated with a learning strategy; a total of nine mean scores obtained are compared. The average mean value score greater than 2 indicate that favorable case, equal to 2 means average mean value and less than 2 indicate that un favorable case. The highest score on a category indicates the most frequently perceived learning strategy.

In the cognitive learning strategy included five types of the learning strategy. The result of the table favor with greater than 2 means values. Rehearsal strategy has highest score mean value most of the student preferred and it is effective while learning mathematics.

Table:1 Cognitive Learning Strategy

S.N	Cognitive Learning Strategies	Mean
1.	Rehearsal	3.21
2.	Elaboration	2.75
3.	Organization	2.85
4.	Critical thinking	2.82
5.	Meta-cognitive	2.68

Source: Field Survey, 2017

From the data as respond of the student, the students gave high preference rehearsal learning strategies with the mean value 3.21 by the students. It indicates that most of the students used these types of the learning strategies while learning mathematics for the effective learning. Two types of the learning strategies Organization and critical thinking were nearly closed to each others with mean value 2.85 and 2.82 respectively. Rarely, followed learning strategies were meta-cognitive with the mean value 2.68 by the students. As evidence it can be shown above table.

Also the research management learning strategies included the four types of the learning strategy all were favor with greater than 2 mean values. All of them with highest mean value score peer learning strategy most of the students preferred while learning mathematics. So it is effective for learning.

Table:2 Research Management Learning Strategies

S.N	Research Management Learning Strategies	Mean
6.	Time and study managements	2.56
7.	Effort managements	2.96
8.	Peer learning	3.36
9.	Help-seeking	3.10

Source: Field Survey, 2017

From the data as respond of the student, the students gave high preference peer learning strategies with the favor high mean value 3.36 by the students it indicated

that the plays the important role and effective while learning mathematics respond of the students. And help seeking was also most favor with 3.10 mean values. But, the student average favors effort management learning strategy with 2.96. Like to give high preference time and study managements with mean value 2.56 and since it could for effective learning. As evidence it can be shown above table.

The nine scales measure three general components of secondary level students learning strategies that seem to be distinct factors. In addition, the learning strategy scales represent an array of different cognitive, meta-cognitive, and resource management strategies that can be reliably distinguished from one another on both conceptual and empirical grounds.

Table 3 Mean value between Boys and girls students

S.N	Learning Strategies	Boys	Girls
1.	Rehearsal	3.23	3.33
2.	Elaboration	2.7	2.75
3.	Organization	2.85	2.70
4.	Critical thinking	2.77	2.86
5.	Meta-cognitive	2.70	2.68
6.	Time and study managements	2.49	2.56
7.	Effort managements	3.08	2.84
8.	Peer learning	3.02	3.31
9.	Help-seeking	3.07	3.08

Source: Field Survey, 2017

From above the data respond of the boys and girls students, these students reported more use the nine learning strategies showed that the students exhibited greater favor mean value used. However, seven learning strategies (rehearsal, elaboration, critical thinking, meta- connective, time and study management, peer group learning, and help-seeking) were used the most by girls students while

(organization and effort management learning strategies) were used most by boys students.

Cognitive Learning Strategy

Cognitive learning strategy is a kind of the learning strategy by which learners use in order to learn to get more successfully. In the classroom activities which can be described as cognitive strategies include making mind maps, visualization, association, mnemonics, using clues in reading comprehension, underlining key words, scanning and self-testing and monitoring. Cognitive strategies component which includes scales for rehearsal, learners can engage in several learning strategies believed to influence the learner's. Encoding process and performance of simple tasks, performance of more complex tasks, and how individuals relate prior knowledge to influence performance. Four scales (rehearsal, elaboration, organization, and critical thinking) are included on the MSLQ to assess general cognitive learning strategies, those factors are analyzed is the following.

Rehearsal Learning Strategy

Rehearsal is considered as simple learning strategy in which information is stored into working memory. Rehearsal strategies include methods for naming, repeating, and reciting material for learning. A rehearsal strategy uses repeated practice of information to learn it. When a student is presented with specific information to be learned, such as a list, often he will attempt to memorize the information by repeating it over and over.

In this rehearsal learning strategies, outlines major formula, generate the new idea, sharing is better and formal seating structures were included. Outline the major formula means whom the students find out the main point while learning mathematics, generated the new idea means who is the develop the new idea to solve

the problem; shearing means who study with friend and seating structure means sequence setting who students were weak in mathematics.

Table;4Rehearsal Learning Strategies

S.N.	Statements	SA	A	UD	DA	SDA	Mean
1.	Outlines major formula from the material.	41	48	7	4	0	3.26
2.	Generate the new idea from the material.	56	40	3	1	0	3.51
3.	Sharing is better with classmate.	70	23	4	3	0	3.60
4.	Formal seating is better attention course.	28	36	19	15	2	2.73
	Total Mean Value						3.27

Source: Field Survey, 2017

Above table depicted the findings that the total mean value which has 3.27 it refers that the more favorable case of the rehearsal learning strategy. The students gave high preference value to sharing is better within classmate with mean value (3.60). Like- wise students gave high preference to generating new ideas from the material to solve problem with mean value 3.51. But, the students like to give high preference to formal seating which has mean value 2.73 and since it could not affect for effective learning.

The research further to be convinced, he inquired with subject teachers. They responded regarding to the context in following ways:

We created the environment practice based learning with peer each others, so most of the students learned sharing with classmate...[based on personal interview with research participant on 6th April, 2017].

The research again inquired with the teachers about why the students preferred sharing is as the best within classmate to gain better understanding of the content, taught in class?

They responded as;

We can learn or memorize for a long time without having confusing and troubling better in learning mathematics...[based on the interview of the teachers on 6th April, 2017].

Table 5 Compare the Mean Value Boys and Girls of Students Rehearsal

S.N	Statements	Boys students' mean value	Girls students' mean value
1.	Outlines major formula from the material	3.16	3.36
2.	Generate the new idea from the material.	3.52	3.53
3.	Sharing is better with classmate.	3.60	3.61
4.	Formal seating is better attention course	2.64	2.82
	Total Mean Value	3.23	3.33

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl's students are greater than 2 mean value 3.23 and 3.33 respectively. This shows that overall rehearsal learning strategy is favorable of both. The statements 1 and 4 have got girls students with the mean value 3.36 and 2.82 respectively and the statements 2 and 3 have got favorable case of the boys students which has mean vale 3.52 and 3.60 respectively.

The degree of the response of highest mean score that indicted that girls students most preferred rehearsal learning strategies than boy's students.

“I always ask the question from the notes I also observed that is able and who is not able memorizing, repeating and reacting of the content and to solve the given mathematical problem. The most of the memorizing, repeating and reacting of the content by girls students than the boys students.”(Mathematics teachers)

In the above study of quantities data and qualitative data which matched each others, This learning strategy of teachers says that students regularly memorizing, repeating and reacting of the content of the studying materials while learning mathematics then understanding the problem girls students than boys students.

Finally, the view of the teachers and students got the data by quantities and interview was same result. The researchers got the conclusion that sharing with the classmate is effective learning strategy for learning mathematics, and students gave high preference to generating new ideas from the material to solve problem avoid it. That result means, the responsible teacher of the effective leaning for mathematics providing and create the environments sharing within classmate while learning mathematics according to the student’s activities, interest and ability is necessary in the Nepalese content.

Elaboration Learning Strategy

Elaboration strategies include paraphrasing or summarizing learning material to help learners build internal connections between one’s prior knowledge and the new material. This strategy is considered a higher order learning skill because the strategy allows learners to store learned information into long-term memory.

These types of the learning strategies used six items to represent use of elaboration learning strategies while learning mathematics. In this strategy, take physical break, don't focuses finding new things, ask again and again consult with my

subject teacher, notes are not necessary try to find out most important idea and make good use time and environment all have got favorable mean value. But reverent learning material isn't necessary has got less favor.

Table 6Elaboration Learning Strategies

SN	Statements	S.A	A	UD	DA	SDA	Mean
1.	Take physical break do work in the class	60	25	9	3	3	3.36
2.	don't focuses finding new things in learning math	16	24	13	38	9	2.00
3.	reverent learning material isn't necessary to learn	19	18	14	36	13	1.94
4.	don't understand the problem ask again and again consult with my subject teacher	29	35	12	19	5	2.64
5.	notes are not necessary try to find out most important idea	49	36	8	4	3	3.24
6.	make good use time and environment	58	26	9	6	1	3.34
	Total Mean Value						2.75

Source: Field Survey, 2017

From the above table the elaboration learning strategy which has favorable case with total mean value 2.75. most of the students needs to take the physical break while learning mathematics with mean value 3.36 and make good use time and environment while learning mathematics with the mean value 3.34, notes are not necessary try to find out most important idea with the mean value 3.24.students also follow the strategy ask again and again consult with subject teacher while practice

mathematics and most of the students don't need relevant materials while learning mathematics with mean value 2.64 means mediator favorable case

and also some of the students don't focus finding new things in learning math the result was mediator with mean value 2.00. Since it could not affect for effective learning.

Justification, most of the teachers told for that, "we make the good environment for the students while learning mathematics."

Table 7 Compare the Mean Value Boys and Girls Students Elaboration

S.N	Statements	Boys students mean value	Girls students mean value
5.	Students have to take frequently physical break to do the work.	3.42	3.36
6.	Don't focus the new things to learn math.	1.72	2.00
7.	Relevant materials are not necessary.	1.98	1.94
8.	Don't understand the problem consult with teachers again and again.	2.64	2.64
9.	Notes are the necessary find out the most important idea.	3.16	3.24
10.	It isn't important summarize the main idea from the materials.	3.28	3.34
	Total mean Value	2.7	2.75

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl's students are greater than 2 mean value 2.7 and 2.75 respectively. This shows that overall elaboration learning strategy is favorable of both.

Likewise, the statements 5, 9 and 10 high favorable preferred both of boy's students than girl's students, statements 8 have favorable of both. And he statement 6 boy's students less favorable with mean valve 1.72 than girl's students with mean value 2.00 means mediator. And the statement 7 both students unflavored with mean value boys and girls students are 1.98 and 1.94 respectively.

The research further to be convinced, he inquired with subject teachers. They responded regarding to the context in following ways:

Most of the students summarize and connections between one's prior knowledge and the new material to learnt then the solve mathematical problem easily by the boys students than the girls students because they are take the notes to find out the most important idea to connect the prior knowledge and the new materials for effective learning...[based on interview conversation with the teachers on 7th April, 2017].

Finally, from the analysis of the both data, it is clear that boy's students most preferred elaboration learning strategy than the girls students because the girls students take the notes to find out the most important idea to connect the prior knowledge and the new materials for effective learning and memorize long time.

Organization Learning Strategy

Organization, also considered a higher order learning strategy includes methods of outlining, taking notes, mapping or connecting key ideas in learning material. Organization is one of the most important learning strategies while learning mathematics and it plays the role like bridge one materials to another's materials learn

math and most of the students to use of strategies to make connections across learning experiences while learning different materials to solve the problem of mathematics, connection the way. The findings of organizational learning research have identified the key processes that drive organizational learning, as well as its context and effects.

In this learning strategy included that change the way is better, do work assignment complete own way, course reading again and again and makes the simple chart, diagram, or tables to help study all were favor with the mean value. Its learning strategy is effective while learning mathematics.

Table 8 Organizations Learning Strategy

SN	Statements	S.A	A	UD	DA	SDA	Mean
11.	Change the way is better to solve the math problem.	34	36	18	10	2	2.90
12.	It is better to do work assignment complete own way	37	36	15	10	2	2.96
13.	Better to read class note and course reading again and again	31	37	14	14	4	2.77
14.	Makes the simple chart, diagram, or tables to help study.	31	34	21	10	4	2.78
	Total Mean Value						2.85

Source: Field Survey, 2017

From the above table the total mean value has got 2.85 means favor this strategy. Better to do work assignment complete own way was favor with 2.96 mean value. Like- wise with weight mean value favor 2.90 students gave high preference to change the way is better to solve the math problem and students using the learning strategy better to read class note and course reading again and again favor mean value with 2.77. Taken the value obtain from the students view most of the students preferred change the way to solve the math problem while learning mathematics.

For the justification teachers told that, *“There are so many way to solve the mathematics many students to solve the problem their own way.”*

Table 9 Mean Value Boys and Girls Students of Organizations

S.N	Statements	Boys students mean value	Girls students mean value
11.	Change the way is better to solve the math problem	2.90	2.64
12.	It is better to do work assignment complete own way	2.96	2.68
13.	Better to read class note and course reading again and again	2.77	2.68
14.	Makes the simple chart, diagram, or tables to help study.	2.78	2.82
	Total Mean Value	2.85	2.70

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl’s students are greater than 2 mean value 2.85 and 2.70 respectively. This shows that overall elaboration learning strategy is favorable of both.

Likewise the average high mean valve of the statements 14 high preferred girls students than boy’s students with the mean value 2.82 and 11, 12 and 13 high preferred boy’s students than girl’s students with the mean value.

The research further to be convinced, he inquired with subject teachers. They responded regarding to the context in following ways:

Most of the students like to present or solve mathematical problems by the vividly (picture, map, diagram, etc) for the effective learning and take easily problems of the mathematics to solve because its long time memorized. Girls students must be actively doing the problem by the picture, map and diagram to solve the problem with own style.”

Finally, from the above both data were correlated each others, the researchers got the conclusion that most both of the girls students and boys students most preferred organization learning strategy, and draw the chart, diagram and table learning better to learn mathematics and they could easily memorize from the figure related organization be careful of those materials in the Nepalese content.

Critical Thinking Learning Strategy

Critical Thinking is a higher order learning strategy which involves applying learned information to knowledge of new situations. Critical thinking is self-guided and self-disciplined processes for conceptualizing, applying, synthesizing, and evaluating information to be learned.

In this strategy included that, don't like to do hard have got less favor mean value, good evidence is important, discuss course materials, give opportunity to students to develop own about course and feel better to learn new topic all have got favor mean value. Overall it is effective for learning.

Table 10 Critical Thinking Learning Strategy

S.N	Statements	S.A	A	UD	DA	SDA	Mean
15.	Don't like to do hard work in the class while learning mathematics.	15	21	14	31	19	1.82
16.	Good evidence is important for the conclusion.	24	43	22	7	4	2.76
17.	Discuss course materials with group of the students.	38	47	6	7	2	3.12
18.	Teacher should have to give opportunity to students to develop own about course.	58	28	7	3	4	3.33
19.	Feel better to learn new topic in math from different source as lecture, reading and discussion.	47	32	8	7	6	3.07
	Total Mean Value						2.82

Source: Field Survey, 2017

It included five types of the question by the result obtain from the data the total mean value favor with mean value 2.82. So critical learning strategy the important role while learning mathematics. Likewise the statement has got the result less favor which has mean value 1.82. Good evidence is important for the conclusion also favor with the mean value 2.76. Discuss course materials with group of the students also best way to solve the problem which has the mean value 3.12 it means favor case by the students. it is necessary for the students teachers should have given opportunity to students develop the own course with high favor mean value 3.33 and Feel better to learn new topic in math from different source as lecture, reading and discussion which has the better for students with mean value 3.07.

Main focused of the students said that

“we can learn easily when the teachers should have create the environment to do work easily, provided time and opportunity for group discussion and develop the own idea by the different source and draw the chart, diagram and table on the board because we can memorize long time through by the figure effective learning mathematics”.

Analysis from above the data among of all statements students most preferred learning strategy evaluated by the weight age mean valve, by the responded by the students gave high preferred with mean value 3.33 teacher should have to give opportunity to students to develop own idea in the classroom. Adversely, the student did not like to give high preference to do hard work with mean value 1.82 and since it could not affect for effective learning.

Table 11 Mean Value Boys and Girls students of Critical Thinking

S.N	Statements	Boys students' mean value	Girls students mean value
15.	Don't like to do hard work in the class while learning mathematics.	1.84	1.80
16.	Good evidence is important for the conclusion.	2.70	2.82
17.	Discuss course materials with group of the students.	3.06	3.18
18.	Teacher should have to give opportunity to students to develop own about course.	3.42	2.24
19.	Feel better to learn new topic in math from different source as lecture, reading and discussion.	2.86	3.28
	Total Mean Value	2.77	2.86

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl's students are greater than 2 mean value 2.77 and 2.86 respectively. This shows that overall critical thinking learning strategy is favorable of both.

The statements 15 and 18 high preferred boy's students than girl's students and 16, 17 and 19 high preferred girl's students than boy's students. Likewise, the statements got less favored from both of the students, since it could not affect for effective learning.

For justification, most of the teachers said that, "*we provide the time for extra curriculum activities related about the mathematics it helps students for inter-connecting the knowledge one to another for news things applying because they can memorize through the one knowledge to another for effective learning they were actively participated for the task boys than girls' students.*"

The analysis above the data justified those students interlink the new learnt knowledge with new things by the extra curriculum activities they can easily got the knowledge and actively participated more girls students.

Finally, teacher should have create the environment to do work easily, provided time and opportunity for group discussion and develop the own idea by the different source better to learn mathematics and they could easily memorize from the figure related organization be careful of those materials in the Nepalese content.

Meta-cognition Learning Strategy

Meta-cognitive strategies refers to methods used to help students understand the way they learn; in other words, it means processes designed for students to ‘think’ about their ‘thinking’. It involves awareness of how they learn, an evaluation of their learning needs, generating strategies to solve problem and then implementing while mathematical problem. In this study, when they start to solve the problem at first they must know that by defining the term or problem, by help the example or materials, class discussion and by reflective process.

It included that, discussion before to study new course, understand the course, change the way, to clarify concept, teacher’s support, to solve mathematics problem in the different ways, class note and make the outlines, related materials and regular place isn’t important for study all are favor mean value.

But note is not necessary to make the learning memorable long time was less favor with mean value. So its strategy is effective while learning mathematics.

Table 12 Meta-Cognitive Learning Strategy

SN	Statements	S.A	A	UD	DA	SDA	Mean
20.	It's not better to discussion before to study new course.	18	26	11	29	16	2.01
21.	Often understand the course then I have been studying in class.	19	41	20	16	4	2.55
22.	While teacher's teaching style is better, to change the way my studying in order.	31	39	14	10	6	2.79
23.	Ask the teacher to clarify concept what I don't understand well.	37	40	10	8	5	2.96
24.	Note is not necessary to make the learning memorable long time.	24	14	11	33	18	1.93
25.	Teacher's support play important role to learn mathematics.	50	36	7	5	2	3.27
26.	Try to solve mathematics problem in the different ways.	44	34	7	14	1	3.06
27.	Class note and make the outlines are necessary to learn mathematics.	42	41	7	9	1	3.14
28.	Related materials are important while learning mathematics.	30	44	15	6	5	2.88
29.	Regular place isn't important for study.	26	24	13	21	16	2.23
	Total Mean Value						2.68

Source: Field Survey, 2017

About the strategy the research used 10 questions under meta-cognitive strategy. As respond of the student the total mean value has favor with the 2.68. It is also effective for learning mathematics. The students gave respond high preference with the favor mean value 3.27 teacher's support play important role to learn mathematics. Likewise About this statement class note and make the outlines is necessary to learn mathematics; most of the students preferred that types of the strategies shown by favorable mean value with 3.14. About the another statements the students gave the high preferred try to solve mathematics problem in the different ways with mean

valve 3.06. But, the student did not like note is not necessary to make the learning memorable long time. The total student's response. An average means value less favor with 1.93 and since it could not affect for effective learning.

In the query, why the important role of the teacher support to learn mathematics they responded that, *“teacher is guide, facilitator, motivator and so for us. We follow what the our teacher prescribe and suggest for better learning to gain better result.”*

From the above analysis of the data it is clear that the students preferred to do the work by the support of the teachers because teacher is guide, facilitator, motivator and so for us. In the learning the students should be provided suggest for better learning to gain better result. The researchers suggest that accountability teacher should be responsible for it.

Table 13 Mean Value Boys and Girls Students of Meta-cognitive

S.N	Statements	Boys students mean value	Girls students mean value
20.	It's not better to discussion before to study new course	1.98	2.01
21.	Often understand the course then I have been studying in class.	2.58	2.55
22.	While teacher's teaching style is better, to change the way my studying in order.	2.88	2.79
23.	Ask the teacher to clarify concept what I don't understand well.	2.88	2.96
24.	Note is not necessary to make the learning memorable long time.	2.08	1.93

25.	Teacher's support play important role to learn mathematics.	3.20	3.27
26.	Try to solve mathematics problem in the different ways.	3.20	3.06
27.	Class note and make the outlines are necessary to learn mathematics.	3.06	3.14
28.	Related materials are important while learning mathematics.	2.82	2.88
29.	Regular place isn't important for study.	2.36	2.23
	Total mean value	2.70	2.68

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl's students are greater than 2 mean value 2.36 and 2.23 respectively. This shows that overall meta-cognitive learning strategy is favorable of both. From the above table the statements 21, 22, 24, 26 and 29 high preferred boy's students than girl's students by the favor mean value, and 20, 23, 25, 27, and 28 high preferred girl's students than boy's students by favor mean value. The statements 20 boys students respond that less favor with mean value 1.98 and the statements 24 by the respond of the girls students less favor by mean value 1.93.

For justification, most of the teachers said that, *"To solve the problem by the own way is the effective learning in the mathematics they learned mostly by the most practice and they generated the different way, more of boys students mostly used own way while solving mathematical problems than the girls students they are comparing teachers method and own way take easily"*.

From the analysis of the both data, it is clear that boys students most preferred meta-cognitive learning strategy than the girls students because the boys students follows the teachers idea and they generated own idea to solve the mathematics problems for effective learning and memorize long time and they are prefect.

Management Learning Strategies

Resource management strategies comprise different approaches to manage and control time, effort, study environment, and in seeking assistance from qualified persons.

Time and Study Managements learning Strategy

Time and study management involves choosing environments that are effective to learning (i.e., free from obstacles) and effectively scheduling, planning, and managing one's study time while mathematics.

Time and study managements learning strategy, spend very much time, make the schedule, make good use, attended regularly and time to review my note all were favor with mean value. So it is effective learning strategy.

Table 14 Time and Study Management Learning Strategy

S.N.	Statements	S.A	A	UD	DA	SDA	Mean
30.	I spend very much time to learn mathematics	23	11	24	29	13	2.02
31.	Make the schedule for study good time and environments.	17	25	24	24	10	2.15
32.	I make good use time for study.	21	30	18	25	6	2.35
33.	I attended regularly in class.	42	45	9	3	1	3.24
34.	I often find the time to review my note before exam.	40	34	19	6	1	3.06
	Total Mean Value						2.56

Source: Field Survey, 2017

From the above table indicated that favor by the student's respond with mean value 2.56. it is effective for the learning strategy. To get the data of time and study management, five types of the question were applied in the questioner. About the statement the respond of the students were high preferred with favor mean value 3.24 and indicated attended regularly in class are very effectively. Next statements about that the students were high preferred with favor mean value 3.06 find the time to review note before exam. Likewise the others statements have favored mean value. Since, it could be effective for effective learning.

In clarification, students told that *“playing around the field to learn easy is not effective while learning mathematics. Teacher should have advice the students understand the new materials need to focused on more rather than play to around easy to learn.”*

From the above analysis data, it is clear that the students preferred and need to that introduction the new materials helping by the teacher rather than to easy to learn around while learning mathematics. The researchers suggested that accountability institution should be responsible for it.

Table 15 Mean Value Boys and Girls Students of Time and Study

S.N	Statements	Boys students' mean value	Girls students' mean value
30.	I often spend very much time to learn mathematics.	1.98	2.02
31.	I make the schedule for study.	2.34	2.15
32.	I make good use time for study.	2.14	2.35
33.	I attended regularly in class.	3.12	3.24
34.	I often find the time to review my note before exam.	2.90	3.06
	Total mean value	2.49	2.56

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl's students are greater than mean value 2.49 and 2.56 respectively. This shows that overall meta-cognitive learning strategy is favorable of both.

Likewise the statements 31 high preferred boy's students than girl's students and 32, 33 and 34 high favor preferred girl's students than boy's students. And the statements 30 by the boys students less favor with mean value 1.98.

For justification, most of the teachers said that, "*most of the girls students manage the time to study mathematics effectively such as (makes scheduling, planning, and managing the time) than boys students.*"

From the analysis of the both data, it is clear that girls students most preferred time and study managements learning strategy than the boys students because the girls students follows scheduling, planning, and managing the time to study mathematics in the exam time, at home and school times for effective learning and get the high achievements in the mathematics subject.

Effort Managements learning Strategy

Effort management refers that keep of the weekly reading and assignments, list of the important item for memorize regular attend in the class and reflects students' commitment to achieve their learning goals even when there are difficulties. The effort a student expends to reach his or her learning goals is termed effort regulation.

Efforts management learning strategy, ensure that keep up with the weekly reading assignment for this course, make the list of the important item for memorize, for easy and regular attend in the class isn't necessary all were favor with the mean value.

Table 16 Efforts Management Learning Strategy

S.N.	Statements	S.A	A	UD	DA	SDA	Mean
35.	Students ensure that keep up with the weekly reading assignment for this course	27	39	21	10	3	2.77
36.	Make the list of the important item for memorize, for easy.	31	47	12	7	3	2.96
37.	Regular attend in the class isn't necessary, feel bored and lazy.	49	30	10	9	2	3.15
	Total Mean Value						2.96

Source: Field Survey, 2017

To obtain the evidence of the effort managements of the mathematics, three types of the question were performed in the questioner with favor total mean value 2.96. it is necessary learning strategy while learning mathematics. About the statement students were agreed regular attend in the class isn't necessary, feeling bored and lazy with favor high mean value with 3.15 and indicated that the students most preferred learning strategy while learning and regular attend in the class isn't necessary feeling bored and lazy. About the next statement agreed with the statements make the list of the important item for memorize, for easy with favor score 2.96 of the total respond and indicated that the favor make the list of the important item for memorize that is the better to learn mathematics. And students were weak preferred students ensure that keep up with the weekly reading assignment for course also favor the total of the students, with mean valve 2.77.

Most of the students who agreed regular attend in the class is necessary for effective, said *"We want to take the motivational from the teacher, following the*

better way, complete the task helps by the teachers and peers, teachers should have to give opportunity to do activities with our hand in the class so regular attend in the class is necessary”

From above the study , the researchers concluded that majority of the students regular attend in the class is necessary for the effective learning because they could solved the problem different way, motivational from the teacher and concerted well on learning mathematics. So the administration should have thought about it.

Table 17 Mean Value Boys and Girls Students of Effort Managements

S.N	Statements	Boys students mean value	Girls students mean value
35.	Students ensure that keep up with the weekly reading assignment for this course.	2.90	2.64
36.	Make the list of the important item for memorize, for easy.	2.12	3.80
37.	Regular attend in the class isn't necessary, feel bored and lazy	3.22	3.08
	Total mean value	3.08	2.84

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl's students are greater than 2 mean value 3.08 and 2.84 respectively. This shows that overall meta-cognitive learning strategy is favorable of both.

The average high means valve boys students than girls students with high mean value 3.08 indicated that effort managements learning strategy high preferred boys students than girls students. From the above table the statements none of them above statements high preferred girl's students, and 35, 36 and 37 high preferred boy's students than girls's students.

For justification, most of the teachers said that, “*Almost students regular in the class most of the girls students. They are interestingly attained in the class. The girl’s students isn’t attained in the class because they are week in the mathematics.*”

As the quantities and qualitative data which matched each others. The researcher’s conclusion that the girls students encourage to learn mathematics and attained in the school and class, to provide especially time for unable students.

Peer Learning Strategy

Peer learning refers to that the group when students grapple with material and tasks in collaboration with their peers they are pushed to consider alternate ideas and perspectives, be responsible to others, and engage in critical and divergent thinking and, therefore, be intellectually of the students learning by co operative with friends while learning mathematics, some of the students most preferred peer learning strategy in the class. To measure peer collaboration, discuss the course material with a group of students in the class.

Peer learning strategy included, learn with peer better, build relationship and solve math problem without peer all were favor with the greater mean value. So it is effective learning strategy while learning mathematics.

Table 18Peer Learning Strategy

S.N	Statements	S.A	A	UD	DA	SDA	Mean
38.	While learn to better, with peer in math.	53	30	13	4	0	3.32
39.	Students have to build relationship with able and motivated students for help.	47	37	12	2	2	3.25
40.	Hard to solve math problem without peer.	39	33	14	10	4	2.93
	Total Mean Value						3.16

Source: Field Survey, 2017

To get the data of the peer learning, three types of the question were asked in the questioner of this study with high favor mean value 3.16. it is most effective learning strategy while learning mathematics. Indicated that peer study is better while learning mathematics in the class. Likewise students were most high preferred to learn better with peer high favor with the mean 3.32 and Students have to build relationship with able and motivated students for help also effective learning strategy with the value 3.25 and that refers those students should have to build the relationship with able and motivate students for help. At last statements also favor for effective learning mathematics with 2.93.

For the justification students told that, *“we have to build relationship with able and motivated students for help because peer relation sharing the knowledge, discussion, encourage and interaction us to learn. We can learn in the different and better way.”*

Table 19 Mean Value Boys and Girls Students of Peer Group

S.N	Statements	Boys students mean value	Girls students mean value
38.	While learning, better to learn with peer.	3.10	3.54
39.	Students have to build relationship with able motivated students for helps.	3.24	3.26
40.	It is hard to solve without peer.	2.72	3.14
	Total mean value	3.02	3.31

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl's students are greater than 2 mean value 3.02 and 3.31 respectively. This shows that overall peer learning strategy is favorable of both.. All of them statements most preferred learning

strategy girls students than boys students. From the above table the statements none of them above statements high preferred boy's students, and 38, 39 and 40 high preferred girl's students than boy's students.

Majority of the teachers viewed, *“most of the students finding the conclusion from the pair discussion. They are actively interaction with the friends. The most of the girls students preferred pair discussion. The few boys students were not attained in the pair discussion because they were dissatisfied as in the time consuming create the conflict and idea creates in their different way.”*

As the quantities and qualitative data which matched each others. The researcher's conclusion that pair discussion most preferred girls students and few of the boys students preferred because they were dissatisfied as in the time consuming create the conflict and idea creates in their different way. But the most girls students preferred and said that it is the necessary for effective learning mathematics.

Finally, above the data the researchers concluded that peer study of math is compulsory because it is sharing the knowledge, discussion, encourage and interaction students to learn better. All of the intuition most has to make these types of policy in the school.

Help Seeking Learning Strategy

Help-seeking can be an adaptive learning strategy that allows one to optimize learning. Students who utilize local resources such as instructors, peers, tutors, additional textbooks, and/or internet resources when encountering difficulties with a learning task can enhance their learning experiences from their teachers and classmates in the learning process.

This learning strategy, sets the goal, taking notes in the class and discussion all are favor with the mean value so it is effective learning strategy while study mathematics.

Table 20Help Seeking Learning Strategy

SN	Statements	S.A	A	UD	DA	SDA	Mean
41.	Sets the goal for myself in order to direct my activities in each study period.	43	40	8	7	2	3.15
42.	When I gets confused taking notes in the class.	40	41	10	9	0	3.12
43.	I try to apply idea from course reading in other class activities such as lecture or discussion.	41	36	13	6	4	3.04
	Total mean value						3.10

Source: Field Survey, 2017

The total mean value of the help-seeking learning strategy with the high favor means value 3.10.

Its means the best learning strategy most of all students and preferred while learning mathematics effectively. About the forty-one statements high preferred with favor score 3.15 sets the goal for myself in order to direct the activities in each study period, and it plays effective role while learning mathematics. About the statements forty-two also students high preferred with favor value 3.12 it's also plays the important role while learning mathematics. At last statements by the obtain data of the students respond favor value with 3.04 were preferred try to apply idea from course reading in other class activities such as lecture or discussion. This strategy plays the effective role learning mathematics.

For the justification, students said that, *“for the effective learning we have to do sets the goal like related mater doing the free practice or activities in the others subject, taking the notes in the confused problem and generated the new idea by the discussion are the better for learning mathematics.”*

Finally, above the data the researchers concluded that for the effective learning mathematics students most following that this types of the strategy for memorable.

The related intuitions and schools keep it strategy for effective learning.

Table 21 Mean Value Boys and Girls Students of Help-seeking

S.N	Statements	Boys students mean value	Girls students mean value
41.	Sets the goal for myself in order to direct my activities in each study period.	3.06	3.24
42.	I get help when, confused taking notes in the class.	3.12	3.12
43.	I try to apply idea from course reading in other class activities such as lecture or discussion.	2.90	3.90
	Total mean value	3.07	3.08

Source: Field Survey, 2017

The above table shows the overall mean value of both boys and girl’s students are greater than 2 mean value 3.07 and 3.08 respectively. This shows that help-seeking learning strategy is favorable of both. Likewise the statement get help when, confused taking notes in the class were equal favor mean value with 3.12 of both of students. And the statement try to apply idea from course reading in other class

activities such as lecture or discussion with favor mean value greater than girls students with 3.90.

Majority of the teachers viewed, *“most of the girls students take the help of teachers, classmate and other materials than boys. Girls students have the built good relationship with the teachers, classmate because take the help of teachers, classmate and other materials encourage to learn mathematics, they are share to each other so that girls students improved their learning in a better way than boys.*

In the analysis of the both data were matched each other, the researcher found that girls students want to learn to take the help of teachers, classmate and other materials. So the school administration should help those students.

Finally, to statements two, highest mean score and for the justification interview of the teachers were used. Male and female students both listed, got the result totally different strategies most frequently used, though they ranked these Strategies differently. Above table shows the frequency counts high mean score. The researchers concluded that from the data gender was to identify the most frequently used learning strategies of the participants. Question two sought to explore gender difference in the participants' use of strategies. However, all of nine learning strategies were used the most by females while high none of strategies was used by male.

Chapter V

Summary, Conclusion and Recommendations

Summary of the Study

This study is descriptive in nature. The main purpose of the study is to assess which learning strategy is mostly liked to solve mathematical problems by secondary school students with respect to gender (boy student and girl student).

It was argued that the independent and successful learning requires effective use of learning strategies. The questionnaire and interview were used as main research tools in the study. The questionnaire was used by the researchers in order to gain information about which learning strategy is likely to be adopted by the students. Likewise, interview with subject teachers was done for verification of the responses given by the students. The study was undertaken in Banganga municipality of Kapilvastu district. The research has taken four public schools. From each school randomly selected students were given to fulfill individual questionnaire. The questionnaire was designed based on the components of the learning strategies such as Rehearsal, Elaboration, Organization, Critical thinking, Meta-cognitive, Time and study managements, Effort managements, Peer learning and Help-seeking and to test for most used or preferred learning strategies and gender differences in learning strategy use.

The collected data were quantified of the likert-five scale. Responded of the student's was descript analysis from the data. The statically data was The high mean valve score identify the most frequently used strategies of the learners as well with the total high mean value score was used to test for gender differences in learning strategy use.

Findings

Overall, the majority of the secondary level students used both cognitive strategies and resource management strategies to help themselves perform learning tasks in mathematics courses.

On the basis of the statistical analysis and the interpretation of the data, these results are following:

-) Total mean favor value score of the students preferred every learning strategy was higher mean value.
-) The frequency count of each of the nine learning strategies showed that the students exhibited greater favor mean value use of three learning strategies: Rehearsal (3.21), Peer learning (3.36) and Help-seeking (3.10). Among the nine learning strategies scales, Peer learning was used most frequently with greater mean value.
-) Significant gender differences were not found in relation to utilizing learning strategies. There was agreement between boys and girls students concerning their dominant learning strategy use. These students reported more use the nine learning strategies showed that the students exhibited greater favor mean value used. However, seven learning strategies (rehearsal, elaboration, critical thinking, meta- connective, time and study management, peer group learning, and help-seeking) were used the most by girls students while (organization and effort management learning strategies) were used most by boys students.

Conclusions

Based on the findings of the study, the following conclusions may be made:

-) The result of the learning strategies questioner of students indicated that of students at secondary tended to use learning strategies that enabled them to use

study hours well and choose environments that could facilitated learning and helped them and fulfilling their learning goals even when they encountered learning difficulties of mathematics.

-) They preferred try to find assistance from their instructors or classmates when difficulties occurred. It means students need to see how other students or teachers used different strategies to solve their mathematical problems. Asking for help to solve. However used be a good strategy since student to learn from others when he or she cannot deal with problems alone.
-) Students of both genders had similar use of learning strategies. Boys and girls students both exhibited more use of applying each of the nine strategies to appropriate learning activities with favor mean value. In a different course, these learning strategies might not be used and gender differences might be easily seen.

Recommendations

With the conclusion, the researcher has recommended some key suggestion which can be fruitful to the related in order to maintain the effective use learning strategies. Empirically, the study offers the following recommendations:

-) All of the students need to guide to use learning strategies while study mathematics.
-) The mathematics teachers should be encouraged to use learning strategies to solve mathematical problem at secondary level.
-) Curriculum should be relevant or it should be designed according to the students need, interest, and market as well. The curriculum should be focused on practical perspectives it can be helps the students using the knowledge day to day in the relation of mathematics. A logical skill and thinking is basically

needed used for the quality learning because those things increase creativity and generate the new idea in the student's mind to solve the mathematical problem.

-) Even though generalizations cannot be made to all secondary school students, classroom teachers should use the study to learn more about their students' learning strategy use and perceptions.
-) Increasing the number of boys students using learning strategy by encourage.

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Appendix A: Questionnaire

Name of the students.....

Location.....

Name of the school.....

Factors related learning strategies

SN	Statements	S.A	A	UD	DA	SDA	Mean
1.	Outlines major formula from the material.	41	48	7	4	0	3.26
2.	Generate the new idea from the material.	56	40	3	1	0	3.51
3.	Sharing is better with classmate.	70	23	4	3	0	3.60
4.	Formal seating is better attention course.	28	36	19	15	2	2.73
5.	Take physical break do work in the class	60	25	9	3	3	3.36
6.	don't focuses finding new things in learning math	16	24	13	38	9	2.00
7.	reverent learning material isn't necessary to learn	19	18	14	36	13	1.94
8.	don't understand the problem ask again and again consult with my subject teacher	29	35	12	19	5	2.64
9.	notes are not necessary try to find out most important idea	49	36	8	4	3	3.24
10.	make good use time and environment	58	26	9	6	1	3.34
11.	Change the way is better to solve the math problem.	34	36	18	10	2	2.90

12.	It is better to do work assignment complete own way	37	36	15	10	2	2.96
13.	Better to read class note and course reading again and again	31	37	14	14	4	2.77
14.	Makes the simple chart, diagram, or tables to help study.	31	34	21	10	4	2.78
15.	Don't like to do hard work in the class while learning mathematics.	15	21	14	31	19	1.82
16.	Good evidence is important for the conclusion.	24	43	22	7	4	2.76
17.	Discuss course materials with group of the students.	38	47	6	7	2	3.12
18.	Teacher should have to give opportunity to students to develop own about course.	58	28	7	3	4	3.33
19.	Feel better to learn new topic in math from different source as lecture, reading and discussion.	47	32	8	7	6	3.07
20.	It's not better to discussion before to study new course.	18	26	11	29	16	2.01
21.	Often understand the course then I have been studying in class.	19	41	20	16	4	2.55
22.	While teacher's teaching style is better, to change the way my studying in order.	31	39	14	10	6	2.79
23.	Ask the teacher to clarify concept what I don't understand well.	37	40	10	8	5	2.96

24.	Note is not necessary to make the learning memorable long time.	24	14	11	33	18	1.93
25.	Teacher's support play important role to learn mathematics.	50	36	7	5	2	3.27
26.	Try to solve mathematics problem in the different ways.	44	34	7	14	1	3.06
27.	Class note and make the outlines are necessary to learn mathematics.	42	41	7	9	1	3.14
28.	Related materials are important while learning mathematics.	30	44	15	6	5	2.88
29.	Regular place isn't important for study.	26	24	13	21	16	2.23
30.	I spend very much time to learn mathematics	23	11	24	29	13	2.02
31.	Make the schedule for study good time and environments.	17	25	24	24	10	2.15
32.	I make good use time for study.	21	30	18	25	6	2.35
33.	I attended regularly in class.	42	45	9	3	1	3.24
34.	I often find the time to review my note before exam.	40	34	19	6	1	3.06
35.	Students ensure that keep up with the weekly reading assignment for this course	27	39	21	10	3	2.77
36.	Make the list of the important item for memorize, for easy.	31	47	12	7	3	2.96
37.	Regular attend in the class isn't	49	30	10	9	2	3.15

	necessary, feel bored and lazy.						
38.	While learn to better, with peer in math.	53	30	13	4	0	3.32
39.	Students have to build relationship with able and motivated students for help.	47	37	12	2	2	3.25
40.	Hard to solve math problem without peer.	39	33	14	10	4	2.93
41.	Sets the goal for myself in order to direct my activities in each study period.	43	40	8	7	2	3.15
42.	When I gets confused taking notes in the class.	40	41	10	9	0	3.12
43.	I try to apply idea from course reading in other class activities such as lecture or discussion.	41	36	13	6	4	3.04

Appendix B: Interview Schedule for Subject Teacher

General Introduction

Name of the Teacher:

Name of School:

Rehearsal Learning Strategy

1. How often do you ask to students for memorizing, repeating and reacting of the content of the studying materials? To acquire knowledge?
2. Who can memorize more? Boy or girls?

Elaboration learning strategy

1. Do the students summarize and connections between one's prior knowledge and the new material learnt matters or not?
2. Who can summarize and connections between one's prior knowledge and the new material more girl or boy?

Organization

1. Do the students like to present vividly (picture, map, diagram, etc)?
2. Who can do this more? Boys or girls?

Critical thinking

3. Can the students interlink the new learnt knowledge with new things?
4. Who can do this more boys or girls?

Meta-cognitive

1. Do you found students solve the problem own way?
2. Who did this more? Boys or girls

Time and study managements

1. Do you found students makes scheduling, planning, and managing one's study time?
2. Who did this more? Boys or girls

Effort- managements

1. Have you found that the students have attended in the class regularly?
2. Who did this more? Boys or girls

Peer learning

1. Does the students study involve using peers (friends, classmates, etc.)?
2. Who likes to follow this method girls or boys?

Help-seeking

1. Do the students take the help of teachers, classmate and other materials?
2. Who do this more girls or boys?
3. Which method do you follow while teaching?