

Some Issues and problems in Teaching learning in Secondary level Mathematics in the context of Nepal

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Abstract: The topic` Issues and problems in teaching and learning Mathematics and Secondary Level in the context of Nepal` has been a problem for some years now, that the teaching learning of mathematics has brought a problem to our future bright who takes mathematics as a difficult subject to read as a course and to teach in our school today.

In this paper we discuss measure issues of the mathematics teaching learning in Nepal. The issues coming from the theories such as social and radical constructivism suggest that teacher are not trained to use such approach in teaching mathematics and there is a lack of teaching aids, materials and technological tools. The issues related to social aspect are gender issues, language issues and issues related to the achievement gap. The cultural issues are related to diversity of geographical, political, economic status and language and ethnicity(Taneja,V.R -1997).

The issues related to pedagogical choice, technology include the technological skills, use of technology and affordances should pay attention to resolving these issues and problems by improving curriculum, training, and teacher resourcing the classroom with local made and new technological tools.

The researcher had identified many issues related to teaching learning mathematics such as classroom management, teaching method and materials, school administration, mathematical content, student background, lack of trained teacher, evaluation and appropriate curriculum for the future need.

Introduction:

Nepal is smallest land lock and developing countries among developing nations in the world. Nepal is full of environmental and geographical variation. Variations are extremely seen social, economically and politically in a Nepali way of existence. The contemporary issues of school education in Nepal are socio culture, curricular, educational (norms, values, life skills, employment), technological, instructional assessment related, quality and relevance based. The basic of curriculum development has outlined many important points including integrated, inclusive, local need base. It supported and life skill oriented(CDC2007) Despite of Nepal's commitment to providing quality education in general and mathematics education by ensuring equity and access, there are so many issues of teaching learning mathematics in the Nepalese context. These issues are related to theories and other is practical in nature. These issues are related to classroom management, teaching method and materials, school administration, mathematical content, pedagogy and student background characteristics, lack of text book, lack of clear objectives and gender issues. In our understanding most of the public schools in Nepal do not have proper management of classroom. They have an appropriate size of classes, not inclusive seating arrangement and there is also lack of technology of learning and teaching mathematics (Panthi and Belbase April 2007). Besides this, in study `Secondary Education in Nepal `by CERID (1999), it is remarked secondary education in Nepal suffer from serious constraints of physical facilities. Most of the school buildings are need of repair and many of them are unsuitable for instructional process. Library and laboratory facilities are either not existence or are in a very poor shape. Text books are often the only source of instruction.

About the method of instruction in secondary education in Nepal (SERID-1987)` the study related most of the teaching in secondary schools consists of lecturing, rote memorization and group reciting, student interaction and question answer techniques are rarely practiced. Little opportunity is provided for independent study, laboratory experience, community study, working with ones hand and so on. The causes responsible for this state of affairs are mostly connected with lack of training among the teacher large class size in urban areas and poor physical facilities in rural school.

Mathematics is a subject which has to be least by doing rather than by reading. The doing of mathematics give rise to the need of a suitable method and place. Laboratory method and mathematical laboratory are proper answers to it. In this context about `mathematics laboratory (`Cott.1982) stated `abstract subjects can be taught dogmatically in a bare room furnished only with desk and seats and containing no other teaching aids but a blackboard. Live mathematical teaching flourishes best in the classroom. Obviously everything depends on the resources at the school disposal. It is possible to give a new look of teaching, even in

unfavorable condition. If the teaching possesses the necessary condition and ingenuity, conversely the best equipment is useless if it is properly used. In planning school today, thought should be given to organizing laboratories for mathematics in the same way as they are organized for physical and natural science.

About the modern mathematics classroom, Bhatia and Bhatia (1990) said that the teachers' tool have long consisted of chalk, blackboard, pencil and text book. However, today is to use demonstration models of various shape and size, drawing instruments, measuring instruments and many pictures pamphlets, books and mathematical magazines. Films slides, overhead projector, manipulative are being used in teaching mathematics in modern classroom. But the teaching system in the context of Nepalese school is totally based on textbooks. On the other hand the teacher use the textbooks as an ultimate means of teaching that does not provide an afford money to spent in materials equipments. Some schools do not have enough classroom is one of the major problems of implementing interactive teaching and learning situation. Classrooms are not well lighted and ventilated, physical facilities such as teaching materials, mathematics lab, computer and collection of low cost cost free materials that are essential for teaching and learning activities are not organized by concerned agencies.

Pandit(2001), wrote in his articles in the 'education and development' mathematics teaching in Nepal is disturbed by so many factors such that lack of teachers involvement in curriculum planning, lack of efficiency to conduct teaching practice of students, lack of books and journals and teaching facilities and aids, student weak background in the subject matters, lack of opportunities given to upgrade their knowledge and huge number of personal problem of teacher.

In order to improve the present situation, Nepal should try to solve the current problem in teaching learning issues to encourage more teacher involvement in curriculum planning secondly give more emphasis to teaching practice of the student. so that, they can be more in touch with classroom reality. More financial resources should be searched to solve the problems of unavailability of books, journals, teaching facilities and aids. Opportunities to update their knowledge through training and refreshment program to make the teacher able to teach mathematics subjects at secondary level(Basnet,B.B.(2003). Emphasis should be given to constructing teaching materials locally rather than buying expensive teaching aids. Seminar should be conducted from time to time and new way of teaching and constructing materials should be discussed.

In the above context, many government and non-government official research indicates huge amount of time and money have been spent to find the problem of teaching in mathematics but no satisfactory result was found. Hence no successful solution can be found to address the problem in teaching and learning mathematics in secondary level. Thus the purpose of the present study to explore the kind extends of problem of teaching and learning mathematics in secondary level(Upadhyya,H.2003). This study focused on exploring the current issues and problem in teaching and learning mathematics.

Statement of Problem:

This study mainly attempted to explore and analyze the current issues and problem in teaching mathematics at secondary level. this study sought to answer the following research question.

- What are the current issues and problems in teaching mathematics at secondary level?
- What are the possible ways to minimize these problems?

Objectives of the study:

- To determine the current issues and problem in teaching mathematics in the context of Nepal.
- To analyze the causes of the problem in teaching mathematics

Review of the related literature:

It is essential to review the related literature to compare the study which provides strong knowledge about the related topic. It describes learning theories on mathematics. Number of books research report, papers and other books can be found that concerned with curriculum, teaching materials, method and so on.

It helps to construct the frame work to achieve the objectives of the study. This chapter deals with the review of other related literature about the facing problem concerning with the teaching instruction, method and materials classroom management, teachers and students characteristics on teaching activities. The researchers had reviewed some related literature.

Pnadit (1999) mention on his article ' the problem in the implementation of three years B.ed. level mathematics curriculum in Nepal. He concluded that mathematics teacher education program in Nepal is disturbed by so many factors such as lack of teacher involvement in curriculum planning, lack of efficiency to conduct teaching facilities and aids, student weak background in the subject matter, lack of opportunities given to upgrade their knowledge and huge number of personal problem of teacher.

There are many theories and philosophies in mathematics education. Radical and social constructivism's are the two philosophies and theories that have been widely debated and discussed in the

literature of mathematics education (Belbase 2014). The views of mathematics such as mathematics are a foreign subject, mathematics as a collection of symbols and as a meaningless subject. Mathematics is a pure and objective knowledge (Luitel 2009) have dominated the world view of most of the math teacher and curriculum expert in Nepal. Hence the subsequent action of teaching- learning and curricular practices in mathematics have severely affected by such world views. We would like to present some theoretical issues of radical and social constructivism of mathematics education. The choice of these two dominant theories are based on contemporary debates on whether learning mathematics in an individual or social phenomenon and the nature of Nepalese social cultural value system(Panthi-2017).

Baral(2000) concluded in his research` there is a problem to implementation of compulsory mathematics curriculum in grade IX`. He concluded that these problems can be mainly attributed by highly idealistic curriculum, inadequate of text book, lack of proper teaching materials, deficit classroom situation, lack of supervisory help, untrained mathematics teacher so on

Marasini(2008) concluded in his thesis that there is problem the mathematics students and teachers in the implementation of mathematics curriculum grade VIII.the conclusion of his study was the subject matter included in the mathematics curriculum of grade eight are not suitable for the level of the student and and it is difficult to implement the objective of the curriculum and also there was vitals problems on teaching on technique of teaching, teaching method and materials, curriculum and textbook e.t.c.

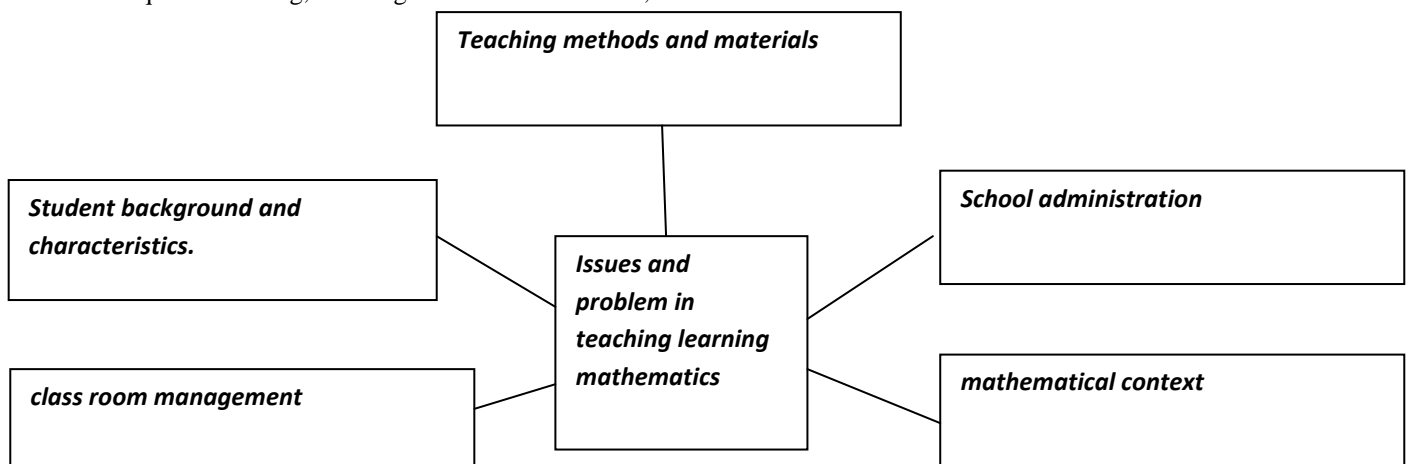


Fig: framework of problem on mathematics teaching

Although mathematics is a subject of interest for many schools, it is not easy to teach and learn .Learning mathematics means getting ability to solve problem. Various techniques appeared and disappeared to handle the problem at time to time but no one is complete. The major factor related classroom management was physical environment of the classroom, teacher attitude, class size, classroom discipline, teacher student relationship etc. The school administration had the major role of maintaining good learning environment by providing good physical resources, organization discipline and solving the causal problems which can hamper the learning process (Chalagain,R.K.-2005). Mathematical contents are number and algebra, measurement and geometry, statistics and probability. Different students may have come from different environment with background. If any students have strong background he can learn many things easily compared to the student with background.

Methods: This chapter deals with method and procedures of the study . It determines how the research becomes complete and systematic. The method applied in this study is discussed in the research design, population of the study and data analysis procedure.

Quantitative cum qualitative approach was adopted to conduct the study. Using this method, more items were asked and more flexible but factual information were gathered. The nature of the study was descriptive and authenticated by qualitative data, for this study twenty- secondary school are selected from Dolakha district and started random sampling techniques. For the collection of primary source of data questionnaire, class observation form and interview schedule were used. The questionnaire was developed by the researcher himself. It included the items relating to various problems which were being faced by secondary school in the case of teaching – learning mathematics. The areas of problems were related to class room management, physical facilities, teaching – learning activities, teaching – materials, methods and evaluation, student mathematical background and teacher training program.

Source of data: Both primary and secondary data had used in this study. Secondary data were used for the understanding of past research study related to this study in literature section that was mentioned in the literature review but primary data were the main source of the analytical section of the study which had carried out through different tools and techniques.

Data collection procedure: For data collection, the researcher visited each of the sample school along with the questionnaire and interview schedule. After explaining the purpose of the visit, the researcher, in his presence request to teacher, student, administration of school, included in the sample to fulfill questionnaire. The researcher explained and clarified any confusion that arose in understanding the statements. After collection questionnaire, the problems are categorized in tabular form.

Data analysis procedure: The obtained data were analyzed and interpreted with the help of following statistical techniques. Mean weighted was used to locate the central position of the responses to the statements.

$$\text{Mean weighted} = \frac{\text{Total rank of score of a statement}}{\text{No. of teacher's responses}}$$

Each statement was study in terms of whether the problems are up to the index or not. If the calculated mean weighted is greater than three, then it concluded that the statement indicates the problems and it is strongly favorable to it. If the average weighted is less than or equal to three then it is less favorable to the problems.

The collected data through class observation and interview schedule were analyzed and interpreted on the basis of the framework that the researcher developed in the review of the related literature section, i.e., The information were categorized in the broader themes area that are economic crises of school, lack of classroom management, lack of motivation, lack of encouragement, lack of appropriate teaching method and materials, lack of teacher training, lack of supervisory help, lack of facility and large class size. Then they were analyzed along with triangulation among the sources of observation, interview and questionnaire. The researcher tried to interconnect with previous finding and the way of analysis in the similar context. The validity and reliability of this study were maintained through cross matching and triangulation method.

Analysis and Interpret

On the basis of the collected data for the study, the collected data were tabulated and analyzed according to the objectives of the study. The tabulated data were statistically analyzed and interpreted by using statistically tool mean weighted. The whole information were categorized, analyzed and discussed under the following topics.

- Problem related to class room management
- Problem related to teaching method and materials
- Problem related to school administration
- Problem related to mathematical content
- Problem related to students background characteristics

Problem related to class room management

For the effective mathematics teaching, the classroom environment should be appropriate and proper environment should be maintained as the size of the classroom according to the number of students, physical facilities etc. Now, the researcher tried to elaborate the following problems in detail related to classroom management.

Table: Problem related to class room management

S.N	Statements	Mean weighted
1	Unavailability of math lab in school	4.1
2	Inadequate of physical facilities in school	3.5
3	Difficulties in completion of course taught by using teaching material on time	3.9
4	Large number of students in a single class	3.7
5	g in mathematics class by students	3.6

The above mean weighted show that there was a problem in using mathematics lab, because there was not separate lab in selected schools. The mean weight of the use of mathematics lab was 4.1. The teacher did not

have an experience about the mathematics lab. The better result was assumed by the use of mathematics lab in school but not practically yet. So, teachers were unknown in using materials in classroom teaching. There was other problem related to classroom management, which was a difficulty in completion of course by using teaching materials on time. The mean weighted of this statement was 3.9. In the sample schools, the course was hardly completed at the end of the session. Similarly, the mean weighted of boredom feeling in mathematics teaching was 3.6 which were favorable to the problem of boredom feeling in mathematics teaching. As the same way the mean weight of the problem of being large no. of student in a single class was 3.7 which mean the problem was found in the classroom and it was difficult to expect higher performance in the examination in mathematics subject. From the above problem, it was concluded that the administrative co-operation in mathematics teaching is being crucial aspects for the achievements of the students. As response of the teacher, no friendly relation was found in the school. The sincerity of mathematics subject could not be found by the school administration. The teaching materials mathematics lab and other facilities were not managed by the school administrator. That caused the problem to the teachers as well as students failed in the examination. The administration and parents used to blame the teachers.

The causes of above problem are economic crisis of administration to add materials for mathematics teaching, lack of proper teaching /learning environment, lack of physical resources and not available separate place to store materials. Hence, there is a lack of classroom management for mathematics teaching due to physical and economics crisis of schools. The community participation should be encouraged to build up good educational environment in school.

Problem related to teaching method and materials

Teaching methods and instructional strategies are the main ways for meaningful teaching and learning of particular topic. The method of teaching should be based on knowledge, understanding, skill and application. For the understanding of the problems in teaching method and materials, the researcher viewed in five sub topics related to mathematical instruction and materials.

Table: Problem related to teaching method and materials

S.N	Statements	Mean weighted
1	Lack of proper space to demonstrate instructional materials	3.4
2	No separate room for mathematics instruction as math lab	3.7
3	The room is equipped with bulletin board	4.0
4	Unavailability of teaching machine and computer	3.9
5	No support of administration to make materials	3.7

On the first statement, lack of proper space to demonstrate instructional materials created problems to the teacher. Their mean weighted score is 3.4. About the second statement, the existence of no separate room for mathematics instruction on math lab, it is found that all teachers are disagreed. The mean weighted of the order of 3.7 in the sample had a separate.

About the third statement, most of the teacher disagreed. The mean weighted of 4.0 also indicates that unavailability of graph board and bulletin board is a real problem. About the fourth statement, the entire sampled teacher disagrees. The mean weighted of 3.9 indicates that there is a genuine problem in teaching mathematics in the absence of teaching machine such as calculator, computers etc.

The fifth statement is about no support of administration to make materials majority of the teachers agreed that there is no support of administration to make materials. The mean weighted of 3.7 indicates that the teacher felt that occasions arose when mathematics can't be taught effectively and meaningfully because of the non-existence of materials.

Problem related to school administration

School administration plays a vital role to construct necessary instructional materials, but if it seems to be passive and irresponsible role on teaching-learning process. For understandings of the problems related to school administration, the researcher viewed some subtopic and their mean weighted are tabulated as

Table: Problem related to school administration

S.N	Statements	Mean weighted
1	Compulsion to take more classes because of low number of mathematical teacher	3.9
2	Irresponsible administration to manage and construct necessary teaching materials	3.3
3	Lack of refresher training to teach difficult and rigor topic	3.7
4	Lack of facilities and reward for the good performance	3.6
5	Library facility is available	3.6

Obtaining the above table from the research, it had been found that the mean weighted of the first statement compulsion to take more classes because of low number of mathematical teacher is 3.9. It means they have class load because of low number of mathematics teacher. The mean weighted of second statement irresponsible administration to manage and construct necessary teaching materials is 3.3 it specific that there is a problem. It means administration is irresponsible to manage and construct necessary teaching materials. The mean weighted of the third statement lack of refresher training to teach difficult and rigor topic is 3.7. It shows that there is a problem on refresher training to mathematics teacher. Teachers need refresher training time to time for difficult and rigor topic to foster a good education. However, during the research, it had been found that most of the teachers were not getting such type of training. The mean weighted on the statement fourth is 3.6. It means this statement is favorable on the problem. On fifth statement about the library facility, most of the teacher stated that the provision of library facility was not satisfactory at all whereas a few teacher opinion that facility is agreeable in their respective schools. A response position corresponding to 3.6 in the rating scale, indeed indicate that the library facility is adequate at all. From above analysis of school administration, it had found that there are many problems related to school administration that hinders teacher's attraction on teaching and then directly affects the student's achievement on mathematics. So, school administration should be good and responsible to address teacher's problem.

Problem related to mathematical content:

Content is the most important elements of the education program in our country, content are design after the information of the objectives of the curriculum. Contents are organized form of skill, attitude and concept marked by the objectives. Contents are helpful for teacher and students to perform their skill in practical life. For the understanding of the problems in mathematical contents, the researcher seeks in for subtopics. The researcher tried to elaborate the following problems in detail related to mathematical contents as follows.

Table: Problem related to mathematical content

S.N	Statements	Mean weighted
1	Some of the units are difficult to teach	3.6
2	Relation between mathematics in school and mathematics in community is low	3.9
3	Content recognize and use connections among them is a problem.	4.1
4	Frequent use of instructional materials to motivate students and make mathematics is a problem	3.1

Obtain the above table from the research about the first statement, most of the teacher's respondent agreed that some of the units are difficult to teach. Only a few teacher respondents disagreed and the mean weighted 3.6 indicates that it is a significant problem for the most of the teacher expressed that they found difficulty to teach for some unit like house arithmetic, menstruation, probability, circle , compound interest, vectors and transformation. About the second statement, 70% of teacher agreed that the relation between mathematics in school and mathematics in community was low, whose mean weighted response on his statement was 3.9 which shows the strong support on problem. Community is most important factor to develop the mathematics education.

On about the third statement, most of the teacher agreed that content recognized and use connection in mathematical ideas, only two teacher respondent disagreed and the mean weighted 4.1 indicate that, it is a significant. In the field survey, most of the teacher says that it is a necessary paint if content recognized and use connection among mathematical idea it is easy to teach mathematics subject and it is helpful in self- study student in mathematics.

About the fourth statement, a few teachers agreed that they make frequent use of instructional but most of the responded teacher disagreed and the mean weighted 3.1 indicates that there is a problem in the use of instructional materials.

From the above analysis of mathematic content, it had found that there are many problems related to mathematical content that mathematics course not finished on time, some units figure are inadequate, some units questions are wrong and unclear. Much course content and less class period available than required a teacher is left with less option than finishing and refresher course should be provided to deal with newly added topics such as: trigonometry, vectors, probability , transformation, geometry, compound interest.

Problem related to students background characteristics

It is generally agreed that students ability are dissimilar in learning mathematics due to various backgrounds such as age, intelligence, gender, maturity, socio-economic status. Poor motivation and failure to provide clear insights in to the meaning and method of the subject to student in mathematics learning is a problem for the teacher. Problem related to students background characteristics have been categorized into four different items to identify the responses of teacher. For the convenience of analysis towards the responses, new weighted for each item had been calculated. This four items and their mean weighted are tabulated as follows.

Table: Problem related to students background characteristics

S.N	Statements	Mean weighted
1	Difficulty in teaching-learning management due to variables of age, individual difference and intelligence of student	3.4
2	Difficulties in teaching mathematics because of difference in social, cultural and family environment of student	3.3
3	Difficulty to involve both male and female student equally in teaching/learning	2.3
4	Problem in teaching due to poor background at primary and lower secondary level in mathematics	3.7

About the above statement, teaching/ learning management due to variables of age, individual difference and intelligence of student indicates problem. Most of the teachers are in the favor of the problem. Mean weighted value of the statement is 3.4, which indicates the problem of majority teachers. Variation is socio-cultural and family environment of student has been a problem for teacher. Mean weighted value 3.3 shows the favorable on problem. During the research, majority of teachers have claimed about the student's poor background in mathematical concept of lower secondary level. Mean weighted response in this statement 3.7 shows the strong favor of teacher towards problem. However, very few cases have been found as problem on participating student of different sex, social and ethnic groups. Mean weighted of the statement involvements of both male and female students equally in teaching/learning is 2.3 and this indicates the less significance over problems. For detail above table summarize the overall problems of teacher due to student's various background characteristics.

Major findings of the study

From the statistical analysis, it was found that there are problems of teaching mathematics in secondary level. On the basis of analysis the findings are in hierarchical order as follows.

- There is a lack of classroom management for mathematics teaching due to the large number of students, books are not available in time and students are utilized by political parties, difficulties to the teacher in the sense of result oriented system and physical and economic crisis of school.
- There are not sufficient mathematical teaching materials and teaching aids and teachers were not using available instructional materials, there is lack of protection for available material for future use. Also there is lack of participatory approach of both student and teacher in the classroom. There is lack of preparation and confidence of teacher's, lack of appropriate teaching method but teacher mostly used lecture method.
- From the study, there were some problems in mathematics content. It was found that the difficulty to teach for some units like home arithmetic, menstruation, probability, circle, compound interest, vectors and transformation. In some topic like home arithmetic, menstruation and vectors had length problem. In circle, transformation and probability had some question are wrong and unclear. In this study there is lack of relation, connection between mathematics in school and mathematics in community. Community does not show any interest on the importance of mathematics, result of mathematics in

school and mathematical achievement of their children. There is lack of interaction between community school administration and mathematics subject teacher content does not properly recognize and use connections in mathematical ideas are also the problem on content.

- Because of poor background, student on mathematics is the problem in teaching mathematics. Classes are much crowded so teacher could not teach mathematics well. Individual differences, variables of age and intelligence of students are from different social, cultural economic and family background so there is also affecting to teach to the teacher.

The causes of above problems are physical and economic crisis of school, work load, large class size and lack of moral education. Lack of moral education, lack of proper teaching/learning management student, students are utilized by political parties, difficulties to the teachers in the sense of result oriented system, not well participatory approaches both students and teachers in teaching at classroom, lack of friendly relation with teacher and students, lack of preparation and confidence of teacher, lack of diagnostic test and oral test, lack of appropriate teaching method, lack of practical concept of mathematics in timely, lack of some correction's source, topic of mathematics to those questions are wrong and unclear, lack of awareness of mathematics teachers and community about importance of mathematics. Lack of teacher training especially for the new concept of mathematics, lack of teacher carelessness, lack of encouragement and supervision, most of the teacher were not conscious and responsible about educational training, lack of meaningful training for mathematics teacher, etc.

Conclusion:

From the above state of findings of this study, it can be concluded that mathematics and learning is not satisfactory in the context of Nepal. Among the five different categorizes described above, it is found that there are numerous problem in teaching-learning mathematics due to classroom management, teaching method and material, school administration, mathematical content, and student background characteristics.

It is also found that there are many problems in teaching- learning mathematics due to lack of training, crowded number of students, lack of proper teaching material, lack of math of lab facility, poor evaluation process time factor, and urban oriented curriculum are the burning problems in teaching mathematics in secondary school level. Similarly, lack of curriculum in new concept of mathematics could not found in time. Some units difficult to teach because of book printing mistakes, figures are inadequate and some questions are wrong and unclear but government does not show any interest to solve this problems. Some as negative attitude towards mathematics is a major physiological problem.

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