

**PROBLEMS FACED BY MATHEMATICS TEACHERS IN  
IMPLEMENTATION OF NEW CURRICULUM AT GRADE XI & XII**

1770

**A  
THESIS**

**BY**

**NIRMALA NAGARKOTI**

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FOR THE DEGREE OF MASTER IN EDUCATION**

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**Letter of Certificate**

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**Mr. AbatarSubedi**

Date: 20 January, 2023



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**Letter of Approval**

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**“Problems Faced by Mathematics Teachers in the Implementation of New Curriculum at Grade XI & XII”** has been approved in partial fulfilment of the requirements of the Master’s Degree in Mathematics Education.

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**Recommendation for Acceptance**

This is to certify that Mrs. **Nirmala Nagarkoti** has completed her M.Ed. thesis entitled “**Problems Faced by Mathematics Teachers in the Implementation of New Curriculum at Grade XI & XII**” under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend and forward her thesis to the Department of Mathematics Education to organize the final viva-voce.

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**Mr. Krishna Prasad Adhikari**

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## **Dedication**

This thesis is dedicated to my father **Mr.Min BahadurNagarkoti**, my mother **Mrs.Reema KumariNagarkoti**, and my husband**Mr.Shishir Kumar Roka**. Whose love, support, and encouragement have enriched my soul and inspired me to purpose and completed this research.

### **Declaration**

This dissertation contains no material which has been accepted for the award of another degree in any institution. To the best of my knowledge and belief, this dissertation contains no material previously published by any authors except due acknowledgement has been made.

.....

Nirmala Nagarkoti

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January, 2023

**Nirmala Nagarkoti**



## Abstract

This thesis entitled " Problem Faced by Mathematics Teachers in Implementation of new Curriculum at XI & XII" is a new and demanding topic in the research area. The objective of the were to explores the problems faced by mathematics teachers in the implementation the new curriculum at grade XI & XII and to identifies the strategies to reduce the teachers' problems in the implementation of a new curriculum. Due to the nature of the study mixed-method research design is used and analysed the collected data. The study only focused on ten public secondary-level schools of Kathmandu district. To collect the data from the field both survey questions and in-depth interview questions were used. 45 individual mathematics teachers were participated in survey interview and 5 were involved in interview.

Overloaded content, internal assessment system, teacher training, professional development, curriculum and textbook, and technological issues are the main problems faced by mathematics teachers in implementing the new curriculum at grade XI and XII. Government should provide training for teachers to enhance their capacity, managesufficient salary, and provide sufficient teachers to reduce work load, local government and nongovernment organization should provide teaching learning materials, parents and civil society encourage teachers to be dedicated in their work. School administration should bring the programs to increase motivation of the teachers and make environment for the teachers in school.

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**List of Abbreviation**

|        |   |                               |
|--------|---|-------------------------------|
| CDC    | : | Curriculum Development Centre |
| TU     | : | Tribhuvan University          |
| SLC    | : | School Leaving Certificate    |
| ZPD    | : | Zone of Proximal Development  |
| BS     | : | Bikram Sambat                 |
| M. Ed  | : | Master of Education           |
| B. Ed  | : | Bachelor of Education         |
| Ph. D. | : | Doctor of Philosophy          |
| NGO    | : | Non-Governmental Organization |
| SMC    | : | School Management Comities    |
| &      | : | And                           |
| %      | : | Percentage                    |

## **Chapter I**

### **Introduction**

This section provides research background, problem statement, research objectives, research questions and research rationale, research boundaries and definitions of related term.

#### **Background of the Study**

Mathematics is important and useful in human life. There is long history of mathematics discipline in the world. People have been using mathematics as main subject of learning from antiquity and has been developing with different civilizations. Mathematics subject has played an important role in building and perfecting all sciences in this world. Mathematics is directly associated with human life and is necessary for civilization. It is believed that the development of mathematics and the development of human civilization go together.

Now mathematics is compulsory course up to ten and teaches as optional subject in class XI and XII. Curriculum Framework 2019 changed the previous provision of curriculum and brought such provision on mathematics curriculum. New curriculum more focuses on practical and follows GPA system which is different from previously practiced evaluation method. CDC (2020) notes the provision as:

Students' content knowledge in different sectors of mathematics with higher understanding is possible only with the appropriate pedagogical skills of their teachers. A total of 34 working hours is allocated for practical and project activities in the different content areas of grade XI and XII. Each student must create a project from each of the eight content areas and give a 15 minute presentation of each project to the class. (CDC, 2020).

Now revised form of curriculum is implemented at grade XI and XII. There is specific change in curriculum but teacher's perception did not include. Without teacher's involvement a curriculum could not implement in school that Jan et al., (2009) noted, "The implementation of educational change is strongly influenced by teachers' perceptions and attitudes towards specific change"(p.4). In the process of curriculum implementation role of the teachers is important because teachers are responsible for teaching learning process. In this regards (Basnet, 2020), (Adhikari 2018) focused on work load and the content side of the curriculum. Content side of the contemporary mathematics class of XI and XII is not flexible for teacher. It showed that concerned authority neglect the role of teachers in preparing curriculum.

Before introducing the curriculums, every stakeholders has to know the background knowledge and concept of the curriculum. According to Tombs (1993, p.175), The word "curriculum" is defined as the word is of Latin origin, initially meaning a racetrack or tune, and in the context of schools, it eventually evolved into a phrase indicating the direction of learning. Views of the Tombs noted that the concept of curriculum is related to race course it is used by the school to run the students. Likewise, The Dictionary of Education defines the term "curriculum" as "the content or flow of a course of study as the content and specification of a course or course of study or, more broadly, the entirety of an educational institution or of the particular learning opportunities that exist in an educational institution" (Jack & Hersh, 2008, p.6). Curriculum is one of the important component for teaching learning which helps to involve teachers and students in particular way of learning. Without a curriculum it is difficult to run education so that it is the essential part of school education. Each of the nation government brings education policy to educate the people with certain

vision and provision of curriculum. So, curriculum is a central hub of the national education policy.

Thirty-four working hours are provided for practical and project-related activities during the clarification of the mathematics curriculum. In Curriculum knowledge of different sectors of mathematics are included with higher understanding. New method of teaching also incorporated in new curriculum but teachers have not got any training on that. In this regards, Adhikari et.al. (2022) noted that "Classroom instruction should be based on a student-centered approach, including project work and problem solving." (p.8). The old topic system of real equation removed from grade XI but this topic has not remove from grade XII. In this context hard labor and new teaching methodology is necessary to achieve the goal of curriculum of mathematics.

Teacher should have certain skill and knowledge to handle class on the basis of the changed curriculum but the situation is different. Teachers role is minimized while preparing the course. After preparing the curriculum, there has not provided basic training about the new curriculum. So, teachers have been facing problems in teaching mathematics at class XI and XII according to the new curriculum but teachers have been teaching on the basis of their experiences.

### **Statement of the Problem**

In Nepal, teachers are facing a variety of problems during the teaching-learning process of the different subjects in different level. Like that teachers teaching mathematics at grades XI & XII have also facing the problems. In this regards, Acharya, (2017) notes, "Especially, mathematics teachers are facing some problems in teaching new mathematical content when the new curriculum was implemented in grade eleven in 2021 AD. For a long period, many kinds of research are concerned



with teaching methods, challenges, influence, continuous assessment and achievement only studies have been done on the teachers' problems with the new curriculum" (p.5). So this research is conducted to search for what the problems are faced by teachers with the new curriculum. Khanal, (2019) focused on human knowledge has also evolved due to various evolutionary technologies. Some intellectual people have suggested to the Government of Nepal to change the curriculum every five years. Government has not any prepared plan to change the curriculum so that teachers and students are facing problems in Nepal after changing curriculum.

Mathematics teachers who are teaching at grade XI & XII said that they are facing many problems in the implementation of the new curriculum at grade XI & XII. After observing the problems, I made plan to focus on the issue and systematically analyzed the problems faced by mathematics teachers. Main thrust of this study is that, what may be the causes of problems for teachers in implementing a new curriculum? What types of problems do teachers are facing implementing a new curriculum? Why do so many teachers take some new mathematical content as more difficult rather than previous old content such as vector & trigonometry?

Different reasons behind it such as the internal assessment system, overloaded content, the mix of different natures of content, pre-knowledge of the students, examination system, the large size of the class, and so on. So, I was curious to these problems faced by mathematics teachers in the implementation of the new curriculum at grade XI & XII and interested in studying this area.

### **Research Questions**

In this study, the research questions are as follows;

1. What are the problems faced by mathematics teachers in implementation of the new curriculum (2021) at grade XI & XII?

2. Why do teachers face a problem for implementing the new curriculum at grade XI & XII?
3. What are the causes of problems for teachers in implementing new curricula?
4. What are the ways to reduce the teachers' problems in implementation of the new curriculum at this level?

### **Objectives of the Study**

To fulfill this research, question the main objective of this study was teachers' problem into the new curriculum and the specific objectives of this study were as follows;

1. To explore the problems faced by mathematics teachers in the implementation of the new curriculum (2021) at grade XI & XII.
2. To identify the strategies to reduce the teachers' problems in the implementation of the new curriculum.

### **Justification of the Study**

Mathematics play very important role in human life so, it has been given an important part of school level curriculum. So, it covers as an obligatory concern at all degrees of school education. The study highlighted the problems faced by mathematics teachers while implementing new curriculum in class XI and XII. So the result of the study would be helpful for policy makers to improve policy on mathematics teaching; especially for untrained teachers similarly the result of this study provides some materials for the improvement of the professional position of teachers by removing the problems related to their profession. The study also significant for school administration to minimize the problems faced by teacher from school's side. It is helpful to curriculum planners, policymakers, and administrators, educationists, mathematicians to make further rules, regulations and policies. Except

that, it helps to find out the ways/strategies to reduce the teachers' problems in implementing the new curriculum. This study helps to find the actual situation of the classroom teaching performance of secondary-level mathematics teachers in the Kathmandu district. This study helps to give suggestions for the improvement in a solution to the problems.

### **Delimitation of the Study**

The following are the limitations of the study;

- ) This study was delimited to the Kathmandu district.
- ) This study was based on ten secondary-level schools in the Kathmandu district.
- ) A total of 45 mathematics teachers were selected for questionnaires and out of them, 5 mathematics teachers were selected for interview as a sampling of the study.
- ) The data collection tools were questionnaires, interview schedules and document analysis.
- ) This study follows the mixed method research design.

### **Operation Definition of Terminology**

**Problem.** It refers to certain huddles or difficulties faced by teachers while implementing or teaching new mathematics in class XI and XII level

**Teacher.** In this study, the teachers who teach mathematics are in grades eleven and twelve.

**Public school.** Public schools are those schools which receive regular grants from the government for a salary of the teacher.

**Curriculum.**It refers to the curriculum of grade XI and XII is prescribed by CDC in the secondary level.

**New curriculum.** It refers to the mathematics curriculum updated by Nepal government in 2021 AD for grade XI and XII.

**Digital technology.** Digital technology refers that the Laptop, Projector, PowerPoint, GeoGebra, Mathematica, and Maple software used by the teachers to make mathematics learning more effective in the classroom.

## **Chapter II**

### **Review of Related Literature**

The review of related literature helps to researcher to make the concept and idea for the study. A literature review helps to find the research gap in certain research studies and explore new ideas from the existing theories. In this research paper first, I reviewed different articles, books and theses related to my topic. In this chapter we discussed about related review of empirical literature, review of theoretical literature, educational implications of the theory, and the conceptual framework of the study.

#### **Review of Empirical Literature**

Devkota(2009),carried out a study on "Problems faced by teachers in the existing curriculum of grade ten". The objectives of this research were to identify the problems faced by mathematics teachers in the existing curriculum of grade X and to suggest some suitable measures to overcome the identified problems. The study design was qualitative and descriptive. He took twenty –five mathematics teachers. The data collection tool was unstructured interview and data analysis procedure was thematically. He concluded that the teaching and learning mathematics in grade ten is disturbed by many factors such as lack of teacher involvement in curriculum planning, lack of instructional facilities and lack of physical facilities and instruments students' weak background in mathematics, improper classroom management defective evaluation system.

Pal (2022), conducted a study on "Problems faced by teachers and students in teaching-learning mathematics in English medium". The main objectives of the study were to analyze the perception of the teacher and students on the role of the English language in teaching-learning mathematics and to explore the kind of problems in teaching-learning mathematics in the English language. The design of the study used

to be qualitative research. He took two teachers and two students. The data analysis procedure was narrative approach. He found that the English medium of instruction is one of the major reasons for less understanding, conceptualizing, memorizing and comprehending.

Apsara (1970), produced an article on "Teacher's problems and solutions in implementing curriculum2013."The main purpose of this article was to show the problems faced by teachers in implementing the curriculum. He further concluded that the teacher had problems related to three aspects. problems related to the teaching and learning process, problems related to the preparation of lesson plans, and problems related to teaching materials. She also concluded that respondents made the following efforts to overcome these issues: Make the most of the equipment provided, collaborate with other teachers, master and use lesson plans from other schools, use previous books.

Regmi (2013), carried out a study "A study of the problems on the implementation of the curriculum of teaching mathematics at grade XI". The objectives were to identify the problem of the implementation of the teaching mathematics curriculum of grade XI and to find out the opinions of students and teachers towards the implementation of the curriculum of teaching mathematics of grade XI in this research. The design of the study was survey type. He took twenty teachers among them 15 trained and 5 untrained and 40 students among them 20 students from Rural areas and 20 students from the urban area were selected for the convenience of the study. He made two sets of opinnionnair for teachers and students based on Likert attitude scale. f He concluded that the problems related to curriculum and textbook, teaching/ learning activities activate, teaching materials, methods and evaluation process are found to a major problem.

K.C. (2015) conducted a study on "The relationship between objectives of mathematics curriculum and present classroom practices at secondary level". The main objectives of the study were to find out the relationship between objectives of the study were to find out the relationship between the objectives of the mathematics curriculum and classroom practices and to identify the factors that influence to fulfill the objectives of the mathematics curriculum in the classroom practice. The design of the study was qualitative research. Observation form and Interview were used data collection tools and data analysis procedures used descriptive analysis identifying and coding the data. He found that different factors influenced the curriculum practices which were insufficient knowledge about curriculum lack of professional training, insufficient instructional materials, low qualification of teachers, unavailability of curriculum and curricular materials, teaching overload and evaluation of teachers' classrooms.

Karakus (2021) developed an article entitled "A literacy review on curriculum implementation problem". The purpose of this study was to discover problems in the implementation of the curriculum and to suggest some solutions to the education authorities. He excluded 39 of his articles and included 72 articles in this review. The study was of a qualitative method and descriptive in nature. The method steps were thematic. He pointed out that issues in curriculum implementation are presented under his four headings: Issues with teachers, issues with students, issues with curriculum, and issues with schools in curriculum implementation.

Rijal(2014),conducted a study on "problems faced by higher secondary mathematics teachers in curriculum implementation" The objective of this study was to identify problems faced by teachers while implementing the existing curriculum in the classroom at the higher secondary level. The design of the study was a survey and

the nature of this study is quantitative and qualitative (mixed). He took 42 mathematics teachers from all higher secondary schools in Salyan District and use of data collection tool is Questionnaire with five point Likert scale. He found that students faced a lack of education and unavailability of classroom environments when implementing curricula at the upper secondary level.

Mendocino (2016) carried out a study on "Challenges towards curriculum implementation in high schools in mount fletcher district Eastern Cape". The main purpose of this study was to explore teachers' teaching experiences prior to 1994 and teachers' views of recent curricular changes, and to identify the support structures and skills necessary for effective implementation of curricular changes. This study used to be the qualitative approach. The nature of the study is Phenom logical. The researcher took three high schools in the mount fletcher district for this study. The study concludes by pointing out that although school management teams (SMT) and Teachers explore to fulfill their roles and responsibilities and ensure that the curriculum is effectively implemented in that context.

Subedi (2010) carried out a study on "Factors influencing the implementation of mathematics curriculum in the classroom practice". The main objectives of her study were to identify the factors that influence curriculum implementation in classroom practice. The study followed the analytic and descriptive approaches (qualitative method). She took four public schools in the Myagdi district. The data collection tool were observation, interview, and focuses group discussions and the study data analysis procedures was descriptive. Her major findings of the study were lack of professional training, insufficient knowledge of teachers about curriculum, materials, physical facilities and instructional materials in the schools teaching overload.



Rijal(2017) conducted a study on "Problems faced by a primary mathematics teacher in the implementation of continuous assessment system (CAS)". The main objectives of his study were to identify the problems of a primary-level mathematics teacher in the implementation of the continuous assessment system. This study was in survey design and both quantitative and qualitative in nature. He took 40 schools out of 398 were selected for questionnaire and for interview selected 20 teachers. He used five point Likert scale where strongly agree, agree, undecided ,disagree and strongly disagree and qualitative data analysis was descriptive nature. The research included there were various problems of primary level mathematics teachers in the implementation of CAS such as in found, school-wise diversity, teacher's training, CAS materials, number of students in class teacher workload, parent awareness student irregularity lack of reward and punishment.

### **Research Gap**

In summary from the different reviews of literature, there are some aspects in the content and textbook of mathematics at the school level. I did not found research has done to find out the problem with the new curriculum of teaching at grade XI and XII. Therefore, this topic or study is a contemporary or current issue in the context of Nepal, because of the new mathematics curriculum in grade XI & XII which has implemented since 2021 AD. There have been no investigations or no research related to this topic. So, I claim that this topic is very unique and my research topic is completely different from other previous research.

### **Theoretical Framework**

This study was formed within constructivism theory because the curriculum is actively applied by teachers while they are differencing old content and new content in the new curriculum. All studies are based on different theoretical concepts.

Teachers, students and parents included in new curriculum implementation. The teachers are having different capacities in the classroom. I chose constructive learning theory as the theory to guide my research. Concrete conclusions were therefore drawn by interpreting and analyzing the collected data in the context of this theory.

**Social constructivism.** According to Slider (2014), the social constructivist theory is the epistemological backbone of this research. It has immense importance for this specific research, as it guides and informs how this research is approached as it guided and interpreted. Constructivist learning theory helps to find out the observation idea and scientific study about how student learning process. (Herreid, 2003). People have built their understanding and knowledge of the world by experiencing things and reflecting on those experiences. When we come across new things, we have to match them with things we haven't thought of in advance. Constructive is an epistemology, learning or meaning-making theory that offers an explanation of the nature of knowledge and how human beings learn (Kant, 2010; as cited in Khanal, 2017). The real understanding is only constructed based on the learner's previous experience and background knowledge. The teacher is a guide facilitator and co-explorer who encourage learners to question, challenge and formulate their ideas, optional and conclusions (Wagle, 2017).

According to Adhikari (2018), constructivism theory argue that the students transform from a passive receipting of information to active participation in the learning process. Students turn out to be engaged by using making use of their current understanding and real-world experience, gaining knowledge of two hypotheses, trying out their theories and subsequently drawing conclusions from their findings (Dahal, 2019). According to Krall (2015; as cited in Saud, 2018) constructivism learning theory stands on its three basic assumption which are as follows:

child/student learn knowledge from their active participation, child/student gain knowledge while reflecting on their actions and child acquire knowledge when they try to pass forward their solution to others.

Vygotsky's social constructivism theory emphasizes socio-cultural learning and highlights the role of social and cultural interactions play in the learning process (Khanal, 2019). This principle no longer has stages, like Jean Piaget's theory.

Vygotsky's principle states that understanding is co-constructed and that people study from one another. It is referred to as a social constructivist principle due to the fact in Vygotsky's opinion the learner ought to be engaged in gaining knowledge of the process. Vygotsky's found that it was important to turn shared knowledge into personal knowledge. The main idea of Vygotsky's cognitive development theory is scaffolding which helps to teach and learn mathematics through PBL scaffolding means cognitive levels supporting the person who helps to know about the context (Devkota, 2014).

Social constructivism continues that human development is socially located and information is built via interplay with others. Social constructivism used to be developed by post-revolutionary soviet psychologist Lev Vygotsky (Acharya, 2017). Vygotsky argued that all cognitive functions originated in social interaction and that learning did not simply comprise the assimilation and accommodation of new knowledge by the learner (Chaudhary, 2011). In this theory zone, proximal development is the main way of learning. ZDP is the distance between a student's ability to perform a task under an adult guide. This theory focused on the active participation of the student in teaching-learning activities where teachers are facilitators or guides (Upadhyay, 2009). As our classrooms are running in traditional teaching strategies where students are passive learners and teachers solve every

problem that's why teaching-learning activities become less effective. The teachers do not apply the new knowledge and teaching strategies gained in pre-service training because of a lack of sufficient knowledge, lack of necessary management and administrative support and so on (Shah, 2016).

Finally, within this theoretical framework, using the theory of constructivism, we have get to the conclusion how do children construct their knowledge of mathematics. As for this question, mathematical knowledge is not imitation. Because you need to actively build your knowledge. The study also illustrates the implications of this constructivist theory of learning, and the data collected will inform how to effectively teach mathematics content by relating it to problems in our culture, social activities, and everyday life related.

### **Conceptual Framework**

A conceptual framework helps to the researcher to conduct activity in the field of the selected study. This conceptual framework has developed through brainstorming with the help of reviewed literature of Regmi(2013), K.C.(2015), Apsara (1970) Pal (2022), Devkota, (2009), Rijal (2017), and Subedi (2010) .The study was based on the following conceptual framework.

1. Frist Prepared the questionnaire related to overloaded content, internal assessment, teachers training, professional development, Curriculum and textbook, student's activities, and technological issues.
2. I found that the problems of mathematics teachers in implementation of new curriculum at grade XI and XII through the Questionnaire and interview.
3. Collected Data was analyzed and interpreted from learning theory.

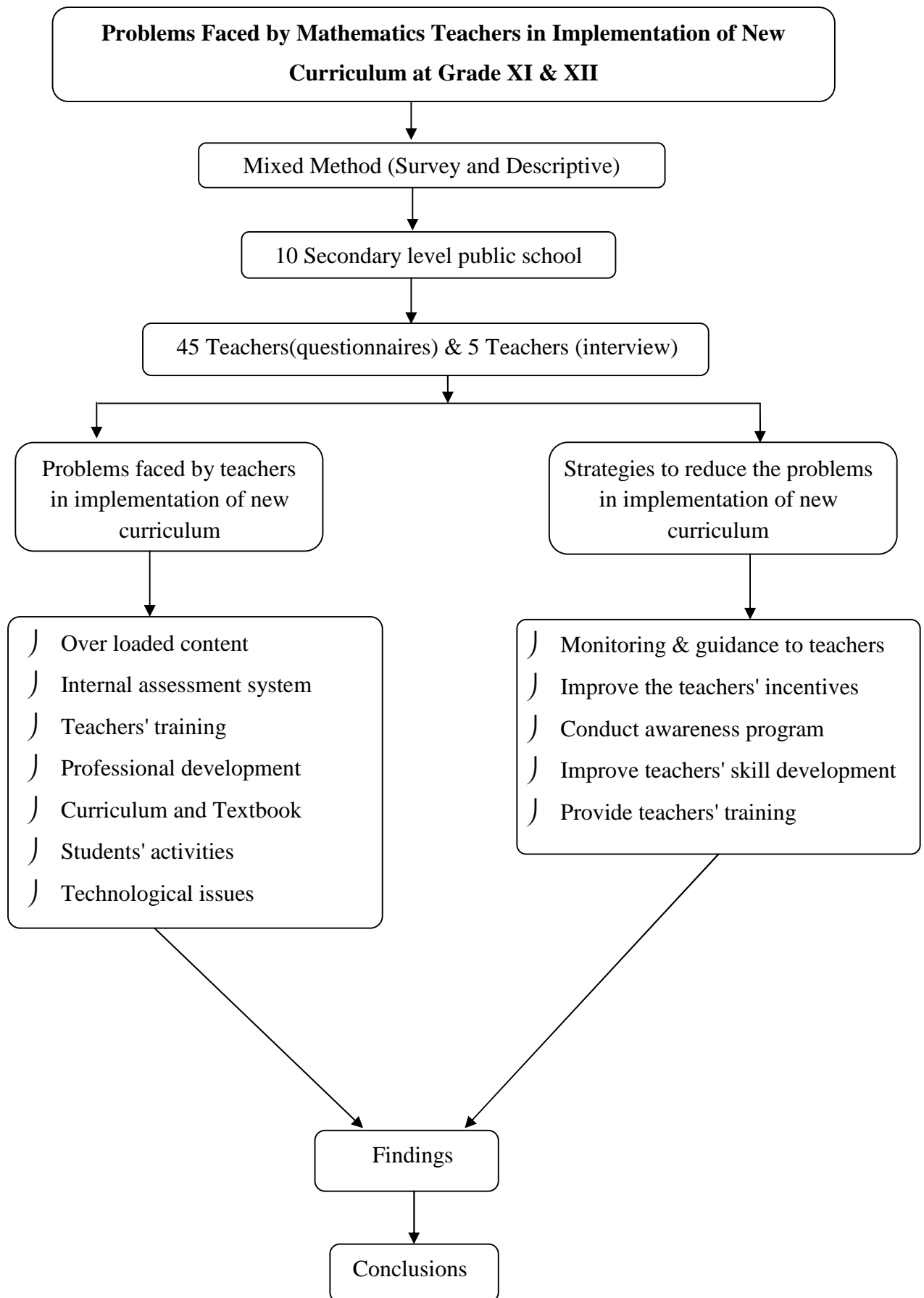


Figure 2.1: Conceptual Framework

## **Chapter III**

### **Methods and Procedures**

In this chapter we discussed about research design, population of the study, sample and sampling of the study, sampling site, tools of the data collection, data collection procedure, data analysis procedure and also ethical considerations.

This chapter described the study design, study population, study sample and sampling, sampling locations, data collection tools, data collection procedures, data analysis procedures, and ethical considerations.

#### **Research Design**

Creswell (2007) argues that mixed methods involves collecting and combining both quantitative and qualitative data into individual study. This means that a mixed methods study design is an approach to collect, integrate and analyze data in both qualitative and quantitative forms in a single study. In a mixed-methods study design, the qualitative methods provide a detailed analysis of the experiences of a relatively small number of respondents, and similarly, the qualitative information provides descriptive detail that puts the quantitative results into the human context. provide (Sindhu, 2012). Mixed methods research advice key inquiry that cannot be answered by quantitative or qualitative approaches This research adopted a Quan-Qualmixed method design where quantitative data was collected by the use of a questionnaire and qualitative data was collected by the use of an in-depth interview.

The first objective of this study is related to exploring the problems of teachers in the implementation of the mathematics curriculum at grade XI and XII. For first objective, I used questionnaires and the second objective is related to interviews with mathematics teachers. So mixed method is very suitable for achieving these objectives for my study. Therefore, I used a mixed-method research approach in this study.

Questionnaires as quantitative research and in-depth interview as qualitative research. The data from questionnaires are quantified and the data obtained through interviews are descriptive in nature. This study was concerned with mixed method research because this method is suitable for my research topic and objectives. Thus, according to my research objectives, I thought that only the mixed method would be fruitful for achieve these objectives. So, I used a mixed-method research approach in this study for achieving the objectives.

### **The population of the Study**

The population of this study included all the mathematics teachers of Kathmandu district who are teaching mathematics at grade XI & XII in government schools. Following a simple random sampling procedure, a total of ten secondary-level schools (see appendix A) located in the Kathmandu district were selected as a population of the study.

### **Sample and Sampling Procedure**

For sample of this study, the Kathmandu district was selected as a research area. In this study, I selected ten secondary-level schools (see appendix A) and a total of 45 mathematics teachers (see appendix B) teaching mathematics at grade XI & XII in the Kathmandu district. It is mixed method research so in this study, two types of samples were selected; in the first type total of 45 mathematics teachers were selected for questionnaires to achieve first research objective and in the second type out of 45 teachers, 5 mathematics teachers have selected the face to face interview for achieve second research objective. I selected ten secondary schools and forty-five mathematics teachers by using the method of the simple random sampling procedure.

## **Tools of Data Collection**

In this research, I used questionnaires and interviews as data collection tools which are described as follows;

**Questionnaires.** The questionnaire was prepared by myself with the help of a supervisor. It contained 56 items based on a conceptual framework, related to various issues faced by mathematics teachers in implementing the new curriculum in Grades XI and XII in Kathmandu district. The area of problems was related to the construction of teaching materials, selection of teaching materials, use of teaching materials, trainer, the opportunity for training, transfer of training in the classroom and school administration. At the end of each section of the questionnaire, respondents were asked to comment on areas not hidden by the questionnaire. It designed as a 5-point rating scale.

**In-depth interview.** The interview is the formal or informal communication between the interviewee and interviewer (Kurt, 2011). It is also one of the major data collection tools which provide basic and personal information towards anything. In this research, I conducted an interview schedule for five mathematics teachers to identify the strategies to reduce the mathematics teachers' problems in implementing the new curriculum at grade XI & XII. The interview supports the qualitative data to make valid conclusions. I am clear about my research, the purpose of the research and the importance of their help. I carried out the open-ended interview along with unstructured interview guidelines.

**Document review.** For the secondary source data, I used document review technique. Data was collected by the different types of information taken from the related books, research reports, journals, school reports. In this study, primary sources



of data were selected from forty-five mathematics teachers teaching mathematics at grade XI and XII.

### **Data Collection Procedures**

I did my best to negotiate my role with the respondents. To conduct this study, we first created a questionnaire using a Likert scale and an interview guide. After that, I selected ten secondary-level schools in the Kathmandu district. After that, I visited these selected schools in the Kathmandu district. Then, I shared the purpose with the research director and the mathematics teacher. In these schools, I took permission from head teachers to distribute the questionnaires to the teachers. After that, I cleared the concept of my research topic, objectives of the study, ethical considerations, and questionnaires. And then I selected 45 mathematics teachers for questionnaires by using a random sampling method. After they agreed, I distributed the survey questionnaires to them at my convenience. After collecting the distributed questionnaires, we invited five volunteer teachers out of the 45 teachers selected to participate in interviews for coverage and further information. Then, I took interviews with selected five mathematics teachers. With the permission of the Interviewees, I noted the important things in each interview.

### **Data Analysis Procedures**

Data analysis is a process that involves examining and modeling collected data for interpretation to discover relevant, information to solve a research problem (Timilsena, 2017). After collecting the data, analyzed and interpreted using both quantitative and qualitative methods. A 5-point Likert scale was used as the statistical means for analyzing the questionnaires. We used mean weight age to test whether the proposition was preferred, and conducted a qualitative task based on the quantitative results. The data obtained were concluded and explained using the following

statistical methods: Mean weight age was used to locate the central position of responses to the entire interviewee expression on the teacher's rating scale. Mean weight age was calculated as:

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

If the calculated mean weight age is equal to or greater than three, then it concludes that the statement is strongly favorable to it. Otherwise, it is unfavorable to the statement. Data collected through interview plan and classroom observations were then concluded and explained based on the framework. The qualitative data obtained from the interview program were analyzed and interpreted thematically.

### **Ethical Considerations**

I considered some ethical considerations in my study such as I distributed the questionnaires to the teachers only after getting the permission with head-teacher or teacher of the related school, I did not collect the data for my gain and my benefit, I collected data without biased manner, I did not publish the name and addresses of participants in the research without their permission and also I used comfortable language in data collection process that is easily understandable for the participants. Interviews were conducted only after participants had been provided with all prior information about the study and given their informed consent. We guarantee the confidentiality of the information you share. I have prepared an agreement containing the confidentiality of their responses.

## Chapter IV

### Analysis and Interpretation

This chapter explores with the analysis and interpretation of collected Data. Data were analyzed and interpreted using statistical methods. Average weighting was used to determine the central position of responses to the entire teacher declaration on the rating scale. Collected data were evaluated according to the study objectives. Collected data were analyzed and interpreted statistically using Likert scales. These data were analyzed in relation to various issues faced by mathematics teachers in relation to the introduction of the new curriculum in grades 11 and 12. The data obtained are analyzed under the following headings and interpreted as follows:

#### **Problems Faced by Mathematics Teachers in Implementing New Curriculum**

First, we organized and concerted the information gathered from the questionnaires and interviews, and based on the answers of the math teachers, we created a separate topic on the problems facing math teachers in implementing the new curriculum in grades XI and XII. Finally, we analyzed and interpreted these issues using previous theories that we incorporated into our theoretical framework. According to responses, the problems faced by a mathematics teacher in implementing the new curriculum at grade XI & XII are presented in the following sub-heading;

**Problems related to the overloaded content of the new curriculum.** The new curriculum can mention the entire classroom program. The excellence of the new curriculum was its integrated vertical and horizontal order, relevant to the needs and interests of the students, relevant to the region, relevant to the current situation. There are five statements about perceptions of overloaded content in the 11th grade and her

12th grade new curriculum, and each statement and its corresponding mean and score are shown in the table below.

Table 4.1 *Over loaded content of new curriculum*

| S.N | Statements                                                                                                         | SA        | A         | U         | D         | SD       | Mean<br>Weightage |
|-----|--------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|----------|-------------------|
| 1   | The content of the new mathematics curriculum is relevant to the present need of students and the context.         | 15<br>33% | 20<br>44% | 3<br>7%   | 4<br>9%   | 3<br>7%  | 3.88              |
| 2   | The arrange of mathematics credit hours in the new curriculum is appropriate.                                      | 5<br>11%  | 10<br>22% | 15<br>33% | 10<br>22% | 5<br>12% | 3                 |
| 3   | The new mathematics curriculum included project work, fieldwork and tutorials as learning approaches.              | 18<br>40% | 12<br>27% | 10<br>22% | 3<br>7%   | 2<br>4%  | 3.91              |
| 4   | The content of the new mathematic new curriculum is locally and globally popular.                                  | 15<br>33% | 10<br>22% | 5<br>12%  | 12<br>27% | 3<br>7%  | 3.53              |
| 5   | The new mathematics content of the curriculum has been able to incorporate recent trends in teaching and learning. | 6<br>13%  | 14<br>31% | 18<br>40% | 2<br>4%   | 5<br>12% | 3.31              |

According to the table 4.1 shows that on the first statement the mean value is 3.88. The statement is favorable because it is more than three. 44% of sample teachers agreed and 7% teachers strongly disagreed. Therefore, the mathematics new curriculum is relevant to the present need of students and context. Similarly, the second statement mean value is 3. It is equal to three thus, the arrange of mathematics credit hours in the new curriculum is appropriate. Total of 22% teachers agreed and 12% of teachers strongly disagreed. Statement no 3 is significant with a mean value of 3.91. so, this statement is favorable. 40% of teachers agreed and only 4% of the teachers strongly disagreed. The new mathematics curriculum included project work, fieldwork and tutorials as learning approaches. Statement no 4 is significant with a mean value of 3.53. it is also more than three so it is positive. About 33% of the sample teachers strongly agreed and 12% of the teachers undecided and 7% of teachers strongly disagreed with the statement. So, the content of the new mathematic new curriculum is locally and globally popular. The mean value of 3.31 which value is greater than 3 so, it is favorable. It indicated that The new mathematics content of the curriculum has been able to incorporate recent trends in teaching and learning. The interview is included check validity of quantitative result. On the interview time the respondent A & B replied

*The content of the new curriculum is overloaded in the present situation, related to students' needs and interests, students want to learn mathematics contents such as project work and group work but many more contents are included in our new curriculum which is more challenging to finish this course at a time.*

*Contents of the new Curriculum are more similar to the previous old curriculum but some new topics are included in the new curriculum. The new curriculum included a class presentation, assignments, group work and internal exams as an assignment which students make more active than in the previous curriculum.*

According to this above response shows that the new curriculum at grade XI & XII is somehow similar to the previous curriculum and Same with textbooks, but day-to-day presentations, homework, internal exams and feedback were additional activities than before. Similarly, both the table and the interview with the teacher next door showed a positive response. Because it is based on student interests, the new curriculum is more meaningful and offers more opportunities for project and fieldwork. Help students learn better and more actively.

**Problems related to internal assessment system.** Providing an assessment is a structured interpretation, understanding the expected or actual impact of a proposal or outcome. Focus on your original goals and what was predicted or achieved. The table below shows faculty members' opinions on the internal evaluation system.

Table 4.2 *Perception of teachers towards an internal assessment system*

| S.N | Statements | SA | A | U | D | SD | Mean<br>Weightage |
|-----|------------|----|---|---|---|----|-------------------|
|-----|------------|----|---|---|---|----|-------------------|

|   |                                                                                                                                           |           |           |           |           |         |      |
|---|-------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|---------|------|
| 1 | In the new curriculum, the assessment and overall education is transparent in mathematics in grade XI & XII.                              | 5<br>11%  | 24<br>53% | 9<br>20%  | 6<br>13%  | 1<br>2% | 3.58 |
| 2 | More weightage to internal assessment create the positive incentive for mathematics students for the continuous study.                    | 11<br>24% | 14<br>31% | 13<br>29% | 6<br>13%  | 1<br>2% | 3.62 |
| 3 | The grading system is familiar to teachers and students.                                                                                  | 7<br>16%  | 16<br>36% | 9<br>20%  | 11<br>24% | 2<br>4% | 3.33 |
| 4 | The teacher provides regular reflective feedback on students' assignment examinations and reduced their negative wash-back effectiveness. | 10<br>22% | 20<br>44% | 11<br>24% | 3<br>7%   | 1<br>2% | 3.78 |
| 5 | There is a gap between the formative and summative evaluation system.                                                                     | 10<br>22% | 22<br>49% | 8<br>18%  | 5<br>11%  | 0<br>0% | 3.82 |

As in the above table, 4.2 shows that statement no first is significant with a mean value of 3.58 this statement positive. 53% of teachers agreed and Only 2% of teachers strongly disagreed. In the new curriculum, the assessment and overall education is transparent in mathematics in grade XI & XII. Statement no two is

significant with a mean value of 3.62 It is favorable. It concluded more weightage to internal assessment create the positive incentive for mathematics students for the continuous study.

Similarly, statement no three is significant with a mean value of 3.33. About 36% Agreed, 16% of teachers strongly agreed and only 4% of teachers strongly disagreed, so we conclude that teachers and students are familiar to grading system. Next statement of mean value is 3.87 more than three so it is favorable. From the total sample teachers, 65% of sample teachers agreed and 12% of teachers strongly agreed with this statement. Hence the majoritythe teacher provides regular reflective feedback on students' assignment examinations and reduced their negative wash-back effectiveness. Respectivelystatement no five is significant with a mean value is 3.82it is more than three so fifth statement is positive. 49% of sample teachers agreed and 18% of teachers were founded that neutral. There is a gap between the formative and summative evaluation system.

Obtain the opinions some teachers through the following interviews regarding the above evaluation.

*Because of the grading system, the evaluation has become advanced however Provision of assessment in the grading system is based on exam oriented and there is no transparent system for internal marks.*

*In the implementing of the new curriculum, internal exams are held timely so that it supports for final examinations but there is a short gap between internal and external exam which makes students difficulty for preparing examinations.*



The teacher's views above suggest that teaching is process-oriented and focused on developing student knowledge, learning, and other skills, not just test- and score-oriented. Internal markings should be evenly transparent. The above teacher's views indicate that students are satisfied with teaching and learning, but the time management of internal and external exams suggests that there is a large gap that is difficult for students. However, teacher perceptions are positive and important.

**Problems related to technology for gaining curriculum information.** Most teachers do not know about how ICT/technology helps for searching new ideas or knowledge in mathematics. The Nepalese Ministry of Education (MOE), despite define macro guidelines, is asking all schools and all teachers how to implement the new curriculum in mathematics classes that integrate mathematics with other subjects. I don't have specific micro-level guidelines on what to support. (Wagle, 2017). In this theme, there were statements five related to the problems faced by teachers in implementing new curricula by using ICT tools. The following table consists of the number of responses of teachers' attitude and corresponding percentage value of questionnaires as;

Table 4.3 *Problems related to technology for gaining curriculum information*

| S. N | Statements                                                     | SA | A  | N    | D    | SD | Mean      |
|------|----------------------------------------------------------------|----|----|------|------|----|-----------|
|      |                                                                | %  | %  | %    | %    | %  | Weightage |
| 1.   | Lack of adequate internet access to search for new information | 25 | 28 | 14.5 | 16.5 | 16 | 3.39      |

---

|    |                                                                                                   |    |      |    |    |      |      |
|----|---------------------------------------------------------------------------------------------------|----|------|----|----|------|------|
|    | related to curriculum.                                                                            |    |      |    |    |      |      |
| 2. | Using technology is not easy for gaining content information without training.                    | 26 | 25.5 | 22 | 14 | 12.5 | 3.43 |
| 3. | Lack of timely feedback from the instructor during new curriculum implementation training.        | 34 | 15   | 20 | 13 | 18   | 3.18 |
| 4. | Lack of technical and educational ability in mathematics education.                               | 28 | 20   | 18 | 19 | 15   | 3.59 |
| 5. | Unfamiliar with the use of technology for gaining new knowledge about mathematics new curriculum. | 23 | 27   | 24 | 15 | 11   | 3.65 |

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The above table 4.3 shows that, the first statement “Lack of adequate Internet access.” In this statement, 25% of teachers strongly agreed and 28% of the teachers agreed and 14.5% of teachers undecided and 16.5% of teachers disagreed and only 16% of teachers strongly disagreed about this statement. The mean score of the statement is 3.39. so, lack of adequate internal access to search for new information. Further on statement 2 “Using new technology not easy without training.” A total of 26% of teachers strongly agreed and 25.5% of teachers agreed and 22% of teachers

undecided and 14% of teachers disagreed and only 12.5% of teachers strongly disagreed about this statement. The mean score is 3.43. It indicates to the researchers that the teacher has a positive attitude towards this statement. In statement 3 “Lack of timely feedback from the instructor.” A total of 34% of teachers strongly disagreed and 15% of teachers disagreed and 20% of teachers undecided and 13% of teachers agreed and only 18% of teachers strongly agreed about this statement. The mean score of the statement is 3.18. It indicates that lack of timely feedback from the instructor during the new curriculum. Further, in statement 4 “Lack of the technical and educational ability in mathematics education.” A total of 29% of teachers strongly disagreed and 20% of teachers disagreed and 18% of teachers undecided and 19% of teachers agreed and only 15% of teachers strongly agreed about this statement. The total mean score of the statement is 3.59. so, lack of technical and educational ability in mathematics. And statement 5 “Unfamiliar with online mathematics learning technology tools and online learning technology costs too much.” A total of 23% of teachers strongly disagreed and 27% of teachers disagreed and 24% of teachers undecided and 15% of teachers agreed and only 11% of teachers strongly agreed about this statement. The mean score of the statement is 3.65. It indicates to the researchers that the teacher has a positive attitude towards this statement. so, Teachers are unfamiliar with the use of technology.

**Problems related to professional development.** The development of skills and the ability of the teacher to perform well in the related sector is known as professional development (Khanal, 2017). According to Pandit (2013) as brief, while talking about teaching professional development, one should be aware to bring modern means of teaching-learning activities into practical use. The teacher should make the teaching profession more meaningful by using modern tools, techniques and

practical activities. In this title I asked five items of statement then the responses of teachers are listed as followed;

Table 4.4 *Problems related to professional development*

| S. N | Statements                                                                                            | SA | A  | U  | D | SD | Mean Weightage |
|------|-------------------------------------------------------------------------------------------------------|----|----|----|---|----|----------------|
| 1    | Lack of opportunities to participate in training related to new curriculum implementation.            | 15 | 18 | 9  | 3 | 0  | 4              |
| 2    | Lack of information about new instructional techniques and invention.                                 | 12 | 15 | 12 | 3 | 3  | 3.67           |
| 3    | Lack of time to study related reference materials.                                                    | 15 | 12 | 9  | 3 | 6  | 3.06           |
| 4    | Lack of opportunity to participate in the interactions and workshops related to the subject's matter. | 12 | 18 | 6  | 6 | 3  | 3.66           |
| 5    | Lack of content knowledge when the new curriculum is implemented without training.                    | 12 | 9  | 15 | 9 | 0  | 3.53           |

Table 4.4 refers that, most of the teachers were facing problems in professional development. Teachers accepted on lacking training opportunities to update their knowledge and skill. On the first statement, the mean weightage responses are 4 on this statement which shows that this strongly favors. So, lack of opportunities in training related to new curriculum implementation. On the second statement, this statement asked by the researcher, the mean weightage response was found to be 3.67. Which signifies the favor. Sometimes teachers could not confident while teaching. In the third statement, the mean weightage response to the question asked by the researcher was 3.06. Likewise, the teacher had accepted that they don't have the opportunity to participate in interactions, workshops etc. to become skilled. On the fourth statement, the mean weightage value of 3.66 and in this statement is favorable. Which is greater than 3 so, no opportunity to participate in the interactions related the subject's matter. Last statement the mean value is 3.53. It shows that the statement is positive. So, there is lack of content knowledge when the new curriculum is implemented without training.

The constructivist theory stated that teachers have needed different abilities and capacities to fulfill the need of the learners. So, teacher training is essential for their profession to develop teaching skills. According to Sindhu (2012) in constructivism teacher is a scaffolder. And zone of proximal development (ZPD) is the main way of learning. For increase, ZPD teachers play an important role to guide the students. In constructivism, teachers need refreshment training to understand the method and skills of the new curriculum implemented at the schools.

**Problems related to teachers' motivation.** According to Yahara (2010), 68.9% (out of 100%) of teachers agreed with the statements that it is necessary for

motivating the teachers for implementing the new curriculum at the secondary school level. In my previous experience, if a teacher has a negative emotion towards mathematical content, then that can negatively affect teaching-learning in this topic. If a teacher shows a preference towards certain teachers or uses derogatory and humiliating language, that can lower their motivation in education (Forum, 2008). Thus, motivation is an influential factor in implementing the new curriculum. The success of learning depends on the high or low motivation of teachers.

Table 4.5 *Problems related to teachers' motivation*

| S.N. | Statements                                                                                                  | SA | A  | U  | D | SD | Mean Weightage |
|------|-------------------------------------------------------------------------------------------------------------|----|----|----|---|----|----------------|
| 1.   | Lack of teacher motivation to involvement in new curriculum planning.                                       | 18 | 15 | 9  | 3 | 0  | 4.06           |
| 2.   | Physical infrastructure is not sufficient for effective teaching and learning activities.                   | 15 | 21 | 6  | 0 | 3  | 4              |
| 3.   | Lack of opportunity to participate in interactions workshop and refreshment training to teach difficult and | 15 | 12 | 12 | 3 | 3  | 3.73           |

rigorous topics.

|    |                                                                         |   |    |    |   |   |      |
|----|-------------------------------------------------------------------------|---|----|----|---|---|------|
| 4. | Low salary is one of the causes of the problem in teaching mathematics. | 9 | 15 | 15 | 6 | 0 | 3.06 |
|----|-------------------------------------------------------------------------|---|----|----|---|---|------|

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The above table 4.5 show that, the different statements on teachers' motivation which were given in consideration of problems in implementing a mathematics new curriculum. From the above table 4.5, it shows that the first statement's mean score is 4.06. Which indicate strong favor of the statement. It means teachers do not involve in new curriculum planning. Thus, it is problematic. The mean score of the second statement is 4.0 which show that teachers are in favor of this statement. It means physical infrastructure is not sufficient for teaching learning activities. The mean score of the third statement is 3.73 which is greater than three so, favor of the statement. They do not get the opportunity to participate in all kinds of training which creates problems in teaching difficult and rigorous topics. Further on the fourth statement, it means low salary is one of the causes of the problem in teaching mathematics. Thus, it is problematic. The mean score of the fourth statement is 3.06 which indicate that teachers' motivation is less due to low salary. Again, when I asked the teacher about the above problems then he responded in the following ways.

*To motivate the instructors in the school through SMC, we can expand the thinking and activity of the instructors about new curriculum in mathematics subject. And also, mathematics can be taught enjoyably. If we can eliminate*

*the misconception of teachers and students towards mathematics subject, then we can increase the interest of teachers in implementing of new curriculum.*

From the interpretation of the above responses, it can be concluded that most of the teachers are local in the concerned area. They present late to school and leave school in their small works. As a result, classes remain vacant.

From the view of constructivism theory, we can be applied in our mathematics classroom in several ways. Mathematics can be taught by dividing the students into small groups with having discussions and interactions with each other. For example, if a student cannot solve the problem of geometry then allow another student to explain this concept who knows about it. And also, effective mathematics teaching/learning depends on the learner's pre-existing knowledge, co-operative with each other, students' abilities, and interaction between student-student and student-teacher.

**Problems related to political activities in the school.** On the survey questionnaires, I included some questions related to the impact of political activities in teaching mathematics in the classroom. In addition to this, they were also asked that their teachers' alignment in political affairs. Their responses are as shown below table;

Table 4.6 *Problems related to political activities in school*

| S. N | Statements                                                            | Number of Responses |   |   | Responses in Percentage |     |     |
|------|-----------------------------------------------------------------------|---------------------|---|---|-------------------------|-----|-----|
|      |                                                                       | A                   | U | D | A                       | U   | D   |
|      |                                                                       |                     |   |   | (%)                     | (%) | (%) |
| 1    | Does school political activities are affected by implementing the new | 36                  | 9 | - | 80%                     | 20% | -   |



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| curriculum in the classroom? |                                                                                                               |    |    |   |       |       |       |
|------------------------------|---------------------------------------------------------------------------------------------------------------|----|----|---|-------|-------|-------|
| 2.                           | Are you involved in any political activities?                                                                 | 39 | 3  | 3 | 86.8% | 6.6%  | 6.6%  |
| 3.                           | There is a problem with the selection of teachers for training because of political activities in the school. | 15 | 30 | - | 33.4% | 66.6% | -     |
| 4.                           | There is a challenge to the implication of the new curriculum at the secondary level.                         | 18 | 21 | 6 | 40%   | 46.6% | 13.4% |

---

Table 4.6 on the first statement "Does school political activities are affected in implementing the new curriculum in the classroom?" 36 (80%) out of 45 teachers have responded that they are affected by implementing new curriculum in the classroom, and only 9(20%) teachers answered with disagreed with this statement. Similarly, on the second statement, 39 (86.80%) out of 45 teachers replied that their teachers are involved in politics activities, 3(6.60%) teacher replied undecided with this statement and also only 3(6.60%) of them responded that their teachers are not involved in politics. On the third statement, 15 (33.40%) teachers agreed with this statement and also 30 (66.60%) teachers replied undecided that there is a challenge in new teacher selection in your school because of political activities in my school. The fourth statement "there is a challenge on the implication of new curriculum at secondary level" shows that 18(40%) teachers agreed, 21(46.60%) teachers undecided with this statement and only 6 (13.40%) teachers replied disagreed with this

statement. Thus, the above table 4.6 shows that politics is deeply rooted in school and teachers are involved in politics although it is an educational institution. Everybody knows that educational areas should be free of politics, but it is most affected by political activities.

**Problems related to school administration.** School administration is responsible for all activities that take place in the school. It plays a vital role in the construction and purchase of the application of curriculum and teaching materials, manage time to construct lesson plans and many more. School administration is all about planning, directing, organizing and controlling human or material resources in an educational setting (Thakuri, 2011). But if it seems to be passive and irresponsible then teachers may face problems in the teaching learning process. For the understanding of problems related to school administration, the researcher raised nine statement. Those questions and their mean weightage are given below;

Table 4.7 *Problems related to school administration in implementing new curriculum*

| S. N | Statement                                                                                        | SA | A | U  | D | SD | Mean Weightage |
|------|--------------------------------------------------------------------------------------------------|----|---|----|---|----|----------------|
| 1    | Our school administration is irresponsible to manage and construct necessary teaching materials. | 12 | 9 | 15 | 6 | 3  | 3.46           |

|   |                                                                                                                          |    |    |    |    |    |      |
|---|--------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|------|
| 2 | It is a compulsion for me to take extra periods due to insufficient mathematics teacher.                                 | 9  | 5  | 8  | 11 | 12 | 2.73 |
| 3 | Lack of refreshment training to teach difficult and rigorous topics.                                                     | 12 | 15 | 6  | 9  | 3  | 2.58 |
| 4 | Lack of amenities and award for appropriate performance.                                                                 | 6  | 6  | 8  | 19 | 6  | 2.71 |
| 5 | There is math lab or library in our school for practicing mathematical activities.                                       | 6  | 8  | 10 | 15 | 6  | 2.84 |
| 6 | The administration often supports economic and physical to construction and purchase in implementing the new curriculum. | 9  | 15 | 12 | 3  | 6  | 3.04 |
| 7 | The administration has provided me with sufficient leisure period to construct lesson plans.                             | 9  | 12 | 6  | 6  | 12 | 3    |
| 8 | Lack of technical support.                                                                                               | 15 | 9  | 12 | 9  | 0  | 3.67 |
| 9 | Lack of facilities and awards                                                                                            | 3  | 12 | 10 | 9  | 11 | 2.71 |

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for good performance.

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From above table 4.7, the first statement was our school administration is irresponsible to manage and construct necessary teaching materials. It shows that the mean weightage of the first statement was 3.46 which is greater than three and indicated that this statement is favor. Therefore, it is concluded that the administration is passive and irresponsible to manage necessary instructional materials. The mean weightage of the second statement was 2.73 which is less than 3 and indicated that this statement is not favor. Hence it is concluded that there was no compulsion for teachers to take extra periods. The mean weightage of the third statement was 2.58 which is less than three and this indicated that this statement is not favor. Thus, it is concluded that the school administration could not manage refresher training to teach difficult and rigorous topics. The mean weightage of the fourth statement was 2.71 which is less than three and hence it was concluded that the school administration had not managed rewards for the good performance of teachers. The mean weightage of the fifth statement was 2.84 which is less than three so, that there was no facility library in most of the schools. Furthermore, there was no facility for mathematics journals, dissertations and reference books in the schools. Further, on the sixth statement, the administration often supports economic and physical construction and purchase in implementing the new curriculum. The mean weightage response of this statement was found to be 3. The mean score of the response to the statement, the administration has provided me sufficient leisure period to construct a lesson plan is 3.67 which is greater than three thus which indicates the favor of the statement. The mean score of the response to the statement, Lack of technical support is 3.67 which is greater than three thus which indicates the challenge. From this field study, it was

found that the lack of facilities and awards for good performance is not a challenge for teachers because the mean weightage of the statement is 2.71.

After summarizing the questionnaires, the researcher came to know that all the teachers were facing problems with the above statements. Besides this, some problems were strongly faced by all teachers. To find out detailed information about that challenge, the researcher carried in-depth study by using interviews. An interview was administered to get the opinion of sampled teachers on problems. Teachers concerning the problems with school administration stated as;

*All the facilities of the school depend on the economic status of the school but we are suffering from financial crises. Our school has no additional source of income. In our school, we have to take six periods out of seven periods. We can't take a rest in the leisure period because we have to check homework in those periods instead. We can't provide technical support in time because we do have not any technical staff" (View of Mathematics teacher)*

From the teacher's responses, the researcher concluded that the school administration should be responsible for supporting economically and physically to construction and purchase of implementation of the new curriculum. Also, school administration should provide appropriate time to construct lesson plans and complete the course in time, teachers should use lesson plans with appropriate methods and materials. The above views of teachers indicate that there is a lack of economical sources in the school and therefore the school administration cannot provide any economic support to a teacher for the construction and purchase of finances helps in implementing the new curriculum. School administration aims to manage such problems with the help of donors. Also, teachers cleared that teachers were not getting sufficient leisure period to construct lesson plans. Further, it is concluded that there

are many problems regarding school administration and such problems hinder teachers' attraction to teaching. Therefore, school administration is required to be careful, good and responsible to address teachers' problems. There was no provision for the award for good performance of teachers and punishment for poor performance as well. Therefore, it is concluded that not getting sufficient leisure periods and technical support is also a problem faced by mathematics teachers in implementing the new curriculum.

According to Vygotsky (1978), learners conduct their knowledge based on interaction with the environment. For making the school environment good, the school administration is responsible to the teachers. According to social constructivism, society is the main source of learning. The school administration has a major role in maintaining a good environment by providing physical resources, instructional material, appropriate time, technical support and refreshment training. If the school administration became weak and irresponsible then the learning environment deteriorates and we cannot expect a good result.

**Problems related to teachers' training.** The application of training skills in real classroom situations is an important aspect of teaching. If there were not transformed training skills, then teaching activities became traditional and boring. For the problems of teacher training in implementing a new curriculum in the classroom, the researcher raised ten questionnaires. The researcher tries to elaborate on the following in detail related to teacher training as;

Table 4.8 *Problems related to teachers' training*

| S. N | Statement                                                                                                          | SA | A  | U  | D  | SD | Mean<br>Weightage |
|------|--------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|-------------------|
| 1    | There is training schedule about how to teach new curriculum content in the classroom.                             | 12 | 3  | 6  | 18 | 6  | 2.93              |
| 2    | A training plan/schedule is organized in our school for teachers to improve teaching-learning activities.          | 3  | 9  | 12 | 15 | 6  | 2.73              |
| 3    | A refresher course (training) is organized frequently for us.                                                      | 6  | 9  | 4  | 14 | 9  | 2.55              |
| 4    | I have participated in any seminar conducted on mathematics yet.                                                   | 6  | 9  | 12 | 15 | 3  | 2.73              |
| 5    | Training is not based on need and demand; it is only for formality and up-grading.                                 | 5  | 7  | 15 | 18 | 0  | 2.98              |
| 6    | I deliver the knowledge and teaching strategies in the class-room whatever I have learned in the training program. | 6  | 10 | 12 | 11 | 6  | 2.98              |

|   |                                                                                                          |    |    |   |    |   |      |
|---|----------------------------------------------------------------------------------------------------------|----|----|---|----|---|------|
| 7 | The trainers are not very good at content to deliver the training.                                       | 9  | 8  | 7 | 15 | 6 | 2.97 |
| 8 | Trainers are not well experienced and skillful in the use of the new curriculum to deliver the training. | 18 | 12 | 7 | 7  | 1 | 3.87 |

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On the above table 4.8, the first statement was "there is no training schedule about how to teach new curriculum's content in the classroom". The first statement shows that the mean weightage of the first statement was 2.93 which is less than three and indicated that this statement was problematic. Again, the second statement was "training plan/schedule is organized in our school for teachers to improve teaching-learning activities". This statement shows that the mean weightage of the second statement was 2.73 which is less than three and indicated that this statement is weakly favor. Thus, there is no training schedule in most schools for teachers to improve teaching-learning activities. The mean weightage of the third statement was 2.55 which is less than three and indicated that this statement was weakly favor. It indicates that a refresher training is not organized for teachers. Next, the mean weightage of the fourth statement was 2.73 which is also less than three so this statement is not favor. Therefore, many teachers have not participated in any seminar conducted on mathematics and this created a problem for the teachers. In this regard, the teachers responded;

*Our school administration crew no longer has any educational training program for us. Some teachers are only sent for training once a year and such*



*training was about possible physical hazards which could occur accidentally like an earthquake, not about our teaching-learning process. It is not possible up to now for me to participate in any seminar conducted on mathematics. I want to participate in training if it is possible and our school manager. (View of Teacher C)*

The above teachers' view indicated that teachers were not getting participated in such training which was related to implementing the new curriculum. The teachers were also not participated in any seminars conducted on mathematics which could be very important and necessary to teachers to improve their teaching skills. The mean weightage of the fifth statement was 2.98 which is less than three and indicated that this statement training is only for formality and up-grading a problem for the teachers. Next, the mean weightage of the sixth statement was 2.98 which is less than three and indicated that this statement was a problem for teachers. In this regard, the teachers responded;

*Students need to get a pass in the examination at any cost, in any other case we have to defend to the school management and the parents. We have more tension among students in the case of the examination result. Job security depends upon the percentage of students passed in the examination. So, we prefer to complete the course in time and to make the students pass than to transfer the training skills in real classroom teaching. (View of Teacher B)*

The above teachers' view suggested that teachers could not transfer training skills in the real classroom because of the unfavorable classroom environment. The construction and use of instructional materials are the focused skill in a teacher training session. On the seventh statement, most teachers disagreed that trainers are not very good at the content to deliver the training. The average response to this

statement is 2.97 which do not signify the challenge. The eighth statement, trainers are well experienced and skillful in implementing the new curriculum to deliver the training is challenging. The average response to this statement is 3.87. It means trainers are not well experienced and skillful in the use of new curriculum to deliver the training. After summarizing the questionnaire, the researcher came to know that all the teachers were facing problems with the above statements. Besides this, some problems were strongly faced by all teachers. To find out detailed information about those problems, the researcher carried in-depth study by using interviews. An interview was administrated to get the opinion of sampled teachers on problems related to implementing a new curriculum in mathematics classrooms as;

*Teachers' training is not based on the need and demands of teachers that are only for formality. Refresher training to teach difficult and rigorous topic are not conducted in school. Trainers are very good at content but they are not well experienced and skillful in the implementation of new curricula to deliver the training. (View of Teacher E)*

The above teachers view cleared that the trainers were not skillful like about how to effectively implement a new curriculum in the classroom. Most training is not based on need and demand. It is only for formality and upgrading. Application of training skills in real classroom teaching /situations is the most important aspect of the study/training. If there is no transfer of training skills the investment of time, money and labor will be useless and there would be a question mark behind the whole package.

**Problems related to curriculum and textbooks.** Gaire's (2020) in his research study, found that implementing the new curriculum is challenging because there is a lack of teachers' knowledge about how we can teach effectively the new

mathematical content to the students. Many teachers are not satisfied with the implementation of the current curriculum and textbook and they said that extra curriculums or textbooks are not suitable. It should be changed according to the demand of time and necessity. In the interview with mathematics teachers, they complained about the complex and larger syllabus in the secondary-level mathematics new curriculum. Teachers argued that, though they want to conduct their mathematics teaching in different teaching methodologies, the curriculum forces them to follow a traditional problem-solving approach. Further, the teachers argue that the secondary level syllabus is usually very vague and teachers often feel problems constructing mathematics knowledge on students inside the classroom and relating their learning with daily life experiences. Similarly, they even complained about the central tendency of the curriculum in which the teachers hardly find space to contextualize mathematics teaching inside the classroom. There are included six statements in this section. Out of them, 5 are favorable and 1 is unfavorable. The mean Weightage of the teachers' responses about new curriculum and textbook on each statement was presented in the following table;

Table 4.9 *Problems related to curriculum and textbooks*

| <b>S.N.</b> | <b>Statements</b>                                                                               | <b>SA</b> | <b>A</b> | <b>U</b> | <b>D</b> | <b>SD</b> | <b>Mean<br/>Weightage</b> |
|-------------|-------------------------------------------------------------------------------------------------|-----------|----------|----------|----------|-----------|---------------------------|
| 1           | The mathematics new curriculum is not practicable.                                              | 9         | 15       | 9        | 6        | 6         | 3.33                      |
| 2           | The mathematics new curriculum does no longer healthy with the existing situation.              | 12        | 21       | 3        | 9        | 0         | 3.08                      |
| 3           | The mathematics new curriculum does not match the age, ability, interest and needs of students. | 15        | 18       | 6        | 6        | 0         | 3.93                      |
| 4           | The subject matter of the mathematics new curriculum is itself difficult.                       | 6         | 6        | 15       | 9        | 9         | 2.08                      |
| 5           | The verbal problem of textbooks is not related to students' daily life.                         | 3         | 21       | 9        | 9        | 3         | 3.27                      |
| 6           | The examples covered in the textual content e-book are no longer sufficient.                    | 6         | 18       | 15       | 3        | 3         | 3.46                      |

The above table 4.9 refers that, the first statement was “Mathematics new curriculum is not practicable” in this statement 58% of teachers agreed with this statement and the mean weightage score was 3.33 for this statement. Therefore, it is a problem. 70% of teachers accepted that the mathematics curriculum does not match the present situation. The mean weightage values were calculated at 3.08 and 3.93 respectively for “Mathematics new curriculum does not match with the present situation” and “Mathematics curriculum does not match to the age, ability. 45% of teachers refused statement four which was “The subject matter of mathematics curriculum is itself difficult.” Which can be said non-problematic through the computation of 2.08. In the same way, 88% of teachers agreed with statement fifth which was “The verbal problem of textbooks are not related to student daily life” Similarly, 62% of teachers agreed with the statement sixth which was “The examples covered in the textual content e-book are no longer sufficient” The statements fifth and sixth both become problematic, because of the mean scores were calculated 3.27 and 3.46 respectively.

From the above statements, we can note that teachers are not practicable and they do not match the present situation. Age ability and need of teachers are also found low. There is a lack of textbooks, and no interaction with child progress from parents is also major problems for student achievement. Schools do not care about children's achievements regularly. Guardians also could not give sufficient time to their children. Fewer class tests in school, and difficult in student evaluation at the end of lessons are problematic factors for teachers.

Acharya (2017) suggests that mathematics knowledge is constructed through social interaction. Vygotsky described ZPD as a distance between a child's ability in independent problem-solving and the potential ability to problem-solve with guidance

(Burton, 1999). Thus, it is better to use the student center method rather than the teacher center technique while teaching mathematics in the classroom. In mathematics teaching, many methods are being used like problem-solving, discussion, question answer, practice, experimental, discovery, etc. There are many issues with applying the theory of social constructivism in teaching mathematics.

**Problems related to students' activities.** According to Acharya (2017), student activities play a vital role in the teaching-learning process and also without students' interest in the teaching-learning activities, there is no possibility to achieve knowledge in the subject matter. Students' achievement depends on their needs, interest, practices and seriousness in the subject matter (Shrestha, 2016). The following table included six statements in this section. The mean Weightage of each statement was also presented in the table as;

Table 4.10 *Problems related to students' activities*

| S. N | Statements                                                                             | SA | A  | U | D | SD | Mean Weightage |
|------|----------------------------------------------------------------------------------------|----|----|---|---|----|----------------|
| 1    | Lack of prior knowledge creates problems in teaching new mathematical content.         | 18 | 12 | 9 | 6 | 0  | 3.93           |
| 2    | Social & cultural background of the students' effect on the teaching-learning process. | 0  | 30 | 6 | 9 | 0  | 3.46           |
| 3    | It is difficult to manage teaching and learning due to individual                      | 12 | 24 | 6 | 3 | 0  | 4              |

differences.

|   |                                                                                                 |    |    |    |    |   |      |
|---|-------------------------------------------------------------------------------------------------|----|----|----|----|---|------|
| 4 | The medium of language affects in implementation of the new curriculum in teaching mathematics. | 0  | 21 | 9  | 6  | 9 | 2.93 |
| 5 | There is an age effect on students for mathematics learning.                                    | 3  | 15 | 15 | 12 | 0 | 3.02 |
| 6 | The mathematics new curriculum is considered most difficult, useless and boring.                | 15 | 12 | 3  | 9  | 6 | 3.46 |

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On the above table 4.10 shows that the first statement was “Lack of prior knowledge creates problems in teaching new mathematical contents” The Mean Weightage of this statement was 3.93, which indicated that it is favourable. 89% of teachers agreed with this statement. So, there is lack of prior knowledge interesting new mathematics content. The statement second statement was “Social & cultural background of the students' effect on the teaching-learning process”.

The mean weightage of responses is 3.46. 58% of teachers agreed with this statement. So, social and cultural backgrounds effects on new curriculum. The statement third was “It is difficult to manage in teaching learning due to individual differences.” It is also another problematic statement because the mean weightage of 4.0 was calculated. 91% of teachers agreed with this statement. The statement fourth was “Medium of language affects in implementing the new curriculum in teaching mathematics”. Only 48% of teachers agreed with this statement. The mean score was calculated to be 2.91 which is less than three. Therefore, it is unfavorable then it

indicates that languages do not effect in new curriculum. Similarly, the statement fifth was “There is an age effect on students for mathematics learning”, which is also problematic because the mean weightage value was 3.02. Therefore, it is problematic. 55% of teachers accepted this statement. About 66% of teachers agreed with the statement sixth which was “New mathematics new curriculum is considered as most difficult, useless and boring”. The mean value was 3.46. From the above statements, we can note that the problems faced by teachers in implementing the new curriculum are classroom management, less priority on mathematical subjects, teachers’ not well qualified and experienced, lack of motivation etc.

Constructivism theory focused on the active participation of the student in teaching-learning activities where the teacher is a facilitator or a guide. Our classrooms are running in traditional teaching strategies where students are passive learners. And teachers solve every problem of mathematics with the lecture method, that's why teaching-learning activities become less effective. So, this theory focused on the active participation of the student in learning. The teacher should teach according to the student's interests. According to Piaget knowledge is not passively received but rather knowledge by the student. The use of video, audio and internet content through the multimedia projector can engage the learners in the teaching and learning process, which can help to create an interactive environment for students and teachers also.

### **Strategies to Reduce the Teachers' Problems in the Implementation of the new Curriculum**

Based on the above problems faced by the teachers in implementing the new curriculum at the secondary level through the questionnaires, in-depth interviews and review of documents analysis with key responses of mathematics teachers then the



strategies to reduce the teachers' problems in implementing the new curriculum are presented as followed;

**Monitor and guidance to teachers.** During the interview time, the majority of the mathematics teachers agreed that there was no monitoring by the school management and mathematics advisory teachers about the implementation of the new curriculum in grades eleven and twelve. However, all five mathematics teachers reported in the interviews that they were monitored by the school management during the implementation process. The mathematics teachers expressed that the school management started by making sure that mathematics was offered to every learner at the senior secondary school level. They also organized regular class visits. The class visits agree with Cordeiro (2012) who indicated that class visits create the opportunity for the school management and advisory teachers to observe teachers' work and provide motivation and guidance. In addition, mathematics teachers reported that the school management also analyzed the learners' results at the end of the year to check learners' progress in mathematics. According to Khanal (2016) note that, the school management monitors and guides new curriculum implementation by ensuring that schemes of work, lesson plans and records of marks are prepared regularly. Further, Shah (2013) added that effective new curriculum implementation takes place in a school where the school management is capable of executing supervisory functions. This implies that for the successful implementation of new curriculum at grade XI and XII, monitoring and guidance should be carried out effectively by the school management. Moreover, during the interview, all the mathematics teachers revealed that they have never been visited, supported, assisted or monitored by the mathematics advisory teachers about the implementation of new curriculum at grade XI and XII. Two of the Mathematics teachers said:

*I never noticed an advisory teacher coming to reveal the implementation of mathematics new curriculum in grades eleven & twelve. (View of Teacher B)*

*Monitoring from the school administration is there in the experience that the outcomes that one is producing at the quite of the year are being monitored. Advisory teachers did not monitor anything. (View of Teacher C)*

This implies that mathematics instructors did not obtain mentorship, training or help from the instructional trainers. Manson (2004) emphasizes that instructional leaders should provide new curriculum direction for the teachers, inspire and energize them, motivate and mediate educational policies to the teachers, mentor and support the teachers and monitor their progress.

**Improve the teachers' incentives.** The interview results showed that teachers faced many problems in their teaching careers. For example, one secondary school teacher said that the salary she gets is not enough to meet the basic life demands like buying food, paying school fees, and buying school. So, she is forced to prepare some business and go with them to school. Therefore, to improve this situation, the interviewed teacher revealed that:

*The technique to pursue is no longer only to increase teachers' salaries, but to have a look at the way salaries are organized, how the teachers are being paid, and their marketing structure that will decide the enlarge in salaries over time. The thought is to overview the normal income system, remuneration patterns and perception of teachers' roles. This ought to always consist of a one-of-a-kind income scale for teachers which will take into consideration their qualification and experience. (View of Teacher D)*

Again, in the same question another teacher said that;

*The implementation of insurance plan incentives specifies the approach to succeed, the incentives wished to be considered to outweigh the social and economic costs of residing in a remote area. General classifications may provide bonuses to teachers working in a difficult environment, negatively doing pretty business to increase the supply of teachers in the most isolated schools. (View of Teacher E)*

The above views of teachers indicate that teachers are not interested in the teaching profession because they do not have to provide enough salary to the government. Highly appreciate the work of the teacher, if the appropriate salary is provided, the teachers seem to be motivated to teach professionally. Due to low salaries, teachers have negative perceptions towards the teaching profession; as a result, teaching is not effective. So, the related government policy needs to increase the teachers' salaries to motivate the teacher in teaching professionals. Thus, it can be found that improving the teachers' salaries and incentives is one of the strategies for making teachers active or energetic and effectively implementing the new curriculum at grade XI and XII.

**Conduct an awareness program for skill development.** Skill development is the technique of honing the current skills, and gaining knowledge of some new skills, whilst retaining the historical competencies if now not raised to a higher stage (Khadka, 2017). According to Kuit (2017) as teachers turn out to be extra educated in the technical capabilities required for the new technology, their wishes may additionally shift to administrative and peer assistance to assist increase and following new makes use of for technological know-how in their classrooms. This kind of assistance can also be furnished to experts gaining knowledge of communities via

normal discussions concerning novel, domain-relevant makes use of the technology.

On interview time, teachers replied as follows;

*Teachers specific they choose to collaborate with their peers have interactive discussions, model awesome practices in a reflective environment, conferences have the likelihood to make getting to understand interactions with the useful resource of the utilization of extra than one construction to grant content.(View of Teacher C)*

*To improve teacher skill development, it needs to focus on teachers' reflection, modelling best practices, and having specific goals in an interactive environment will show improvement in the teacher & student. (View of Teacher B)*

According to Nepali (2020) by attending education applications teachers ought to be in a position to increase their everyday abilities like communication, duty and interpersonal, statistics technology, group work, crucial wondering and align evaluation with studying outcomes and techniques for teaching. Thus, it can be found that conducting awareness programs for teachers' skill development is one of the ways to minimize the teacher's problems in teaching mathematics at grade XI and XII.

**Provide opportunities for teachers in training.** According to Khan (2012), the most commonly cited reason for the lack of technology implementation in the classroom is inadequate professional development and training. The specific type of coaching that is available to teachers is additionally an important consideration. Without the integral resources to provide non-stop technological training, schools and districts will continue to cite inadequate professional improvement as the most important barrier to technological know-how implementation. During the interview time, the responses of related teachers are presented as follows;

*The problems of instructors can also solve if the faculty administration organizes a variety of packages related to trainer education and want to increase our capabilities and motivation for teaching mathematics. (View of Teacher A)*

*In our school, there is no obvious teachers' selection for training. if there is a selection, no instructor is coaching on our activity and needs. Our troubles would be solved if there were training that would assist us to recognize our real problem and help in teaching.(View of Teacher C)*

The above teachers' view indicated that the teachers were not getting participated in such training which was related to implementing the new curriculum and also improving their professional development. The teachers were not participated in any seminar conducted on mathematics which could be very important and necessary for teachers for their professional development because to come with a fresh and new mind in the classroom is fruitful. Thus, it can be found that providing opportunities to a teacher for training is one of the strategies for making teachers active or energetic and also effectively implementing the new curriculum at the secondary level.

**Availability of resources and materials to teachers.** During school observation time, it can be seen that very few schools, schools are well equipped with resources such as textbooks and furniture for all the learners at the senior secondary school level. This finding is supported by Neupane (2016) who states that the government must provide, among others, physical facilities such as classrooms, and teaching resources to create an environment in which implementation can take place. However, in the interview sessions, the mathematics teachers emphasized that they lack mathematics teaching aids such as classroom posters, projectors, calculators and

mathematical instruments for use on the whiteboard and also for the learner's use.

Two of the mathematics teachers said:

*I agree, in our school, there is a lack of instructional materials and resources for teaching mathematics, but we have enough textbooks and furniture for all the learners. Mathematics textbooks that are being provided by the government are not enough as well. Of course, we are lacking teaching aids, projectors, mathematical sets and calculators to mention just a few. (View of Teacher E)*

The implementation of the new curriculum included a well-orchestrated delivery system such as the provision of teachers, enough textbooks and other resources (Poudel, 2015). Khadka (2016) concluded that a mathematics curriculum to be successfully implemented at secondary schools must have been well-equipped with all the necessary teaching utilities and resources.

#### **Communication between policy-makers and curriculum implementers.**

During the interview time, most of the mathematics teachers disagreed with the statement as there was communication between policy-makers and curriculum implementers about the decision to make implement a mathematics new curriculum at grade XI and XII. In response to this statement, the mathematics teachers reported in the interviews that there was no communication since they were not consulted. Two of the mathematics teachers argued that:

*We did not get to share our views and any ideas about the implementation of the mathematics new curriculum during training time because the training program was passive activeness and we did not get opportunities for sharing our experiences during this training. (View of Teacher D)*

*Teachers are never involved during the decision-making process. We only get*

*the results of the decision taken within a certain group of individuals who planned it and we must then implement it. (View of Teacher F)*

Teachers may additionally no longer have to make all the selections but, at the very least, there need to be ways for them to develop a feeling of commitment towards those decisions. A related mistake in planning occurs in overlooking the importance of communication during the implementation process (Fullan, 2009). We can't expect that instructors will implement a new curriculum effectively if only they recognize it properly enough. Therefore, planning for implementation requires formal channels for two-way conversation among these concerned in the implementation process.

Collaboration with teachers is also one of the strategies to make teachers active or energetic and to effectively implement the new curriculum at the secondary level. Teaching is not an easy task. In my research study, I also found that one of the best ways to handle the problems in implementing the new curriculum was a collaboration with teachers. Almost all teachers said that they collaborate with other teachers to handle educational challenges.

*Sometimes, students raise the unexpected question and I get more challenges. In this condition, I take help from other teachers (View of Teacher C)*

According to Brownell et al. (2006), collaboration is viewed as a powerful tool for helping teachers who serve teachers with disabilities. Like this statement, I also found that teachers collaborate for the solution of implementing the new curriculum. It is the symbol of the better in teaching because, from the collaboration, we can get various better tips to handle the problems in teaching mathematics.

### Suggestion for Effective Implementation of the New Curriculum

Overall, by supporting all these above views mathematics teachers suggested the ways to reduce the teachers' problems in implementing the new curriculum in grade eleven and twelve as followed;

Table 4.9: *Suggestion for effective implementation of the new curriculum*

| Teachers | Suggestions/Responses                                                                                                                     |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------|
| A        | Amend curriculum to accommodate slow learners. Policy-makers should consult mathematics teachers and advisory teachers should support us. |
| B        | Mathematics teachers should be trained on how to link mathematics to real-life situations in implementing new curriculum                  |
| C        | Teachers need to be made properly organized for the implementation. Support from advisories.                                              |
| D        | The government should provide enough resources to the schools for implementing new curriculum.                                            |
| E        | Content of textbook ought to be revised with the syllabus requirements.                                                                   |
| F        | Mathematics have to be made most of practical and relevant for students. Allocate smaller class groups and appoint more teachers.         |
| G        | The government grant in-service educational training and different seminar & workshops to prepare teachers.                               |
| H        | Policy-makers need to make a follow-up on whether or not the policy used to be applied effectively.                                       |



## **Chapter V**

### **Findings, Conclusion and Implications**

This chapter includes the findings of the study, conclusion, implications of the study and recommendations for further study. In this chapter findings and conclusion are derived from the analysis and interpretation of the previous chapter and finally recommends how these findings can be used in the academic field. This chapter concerns the following heading or sections;

#### **Findings of the Study**

Based on the analysis and interpretation of the data, the findings of this study are presented below;

- ) This study found that problems related to teachers' training, overloaded content, political activities in the school, teachers' motivation, school administration, students' activities, lack of technology for gaining curriculum information and problems related to curriculum and textbook are the problems faced by mathematics teachers in implementing of the new curriculum at grade XI and XII.
- ) This study found that providing opportunities for teachers in training, improving teachers' salaries, monitoring & guiding to teachers, providing resource materials to teachers and conducting awareness programs for teachers' skill development are the ways to reduce the teachers' problems in the implementation of the new curriculum.
- ) School Administration is irresponsible to provide the necessary materials or equipment to teachers and also there is no provision for a separate math lab for effectively implementing the new curriculum.

- ) Communicating between policymakers and curriculum implementers is one of the strategies to make teachers active and also to effectively implement the new curriculum at grade XI and XII.
- ) There is a lack of school administrative support. The school administration doesn't manage refreshment training to teach difficult and rigorous topics simply and interestingly.
- ) Most schools have no proper schedule for refreshing training to deal with how to implement the new curriculum in the classroom. Moreover, they are not participating in any training although they want to do so.
- ) To implementing of the new curriculum is challenging because there is a lack of teachers' knowledge about how we can teach effectively the new mathematical content on classroom.
- ) Many teachers are not satisfied with the implementation of the current curriculum and textbook and they said that extra curriculums and textbooks are not suitable.
- ) Mathematics teachers argue that at grade XI and XII curriculum/syllabus is usually very vague and teachers often feel problems constructing mathematics knowledge for students inside the classroom
- ) There were not sufficient mathematical teaching materials. Teachers have not available instructional materials, there was a lack of preparation and confidence in the teacher, lack of appropriate teaching methods therefore teachers do not focus on students' centred methods.
- ) It is difficult to manage teaching learning due to individual differences of students because a large number of students in a single room create problems in teaching.

## **Conclusion**

The findings of the study indicated that, if the implementation of the curriculum is not well planned, it can make difficulty for teachers to teach mathematics effectively and efficiently. Teachers need to be concerned with the complete technique of curriculum change, from the planning/designing section to the implementation phase. School administration is irresponsible to provide the necessary materials or equipment for teachers, inappropriate school environment and pressure in the courses must be completed in time at any cost, unavailability of math lab, inactiveness of students in the technology-based classroom, lack of training for teachers, inability to link technology tools and the curriculum, lack of teacher involvement in curriculum planning, lack of well experienced and skillful trainer in the implementation of new curriculum etc. are some of the problems faced by mathematics teaching in implementing the new curriculum at grade XI and XII.

It is concluded that it also emerged that teachers were not consulted concerning the planning and designing of the new curriculum. Half of the mathematics instructors indicated that the school administration monitored, and gave assistance and help to the mathematics instructors in the implementation of the mathematics curriculum in grades eleven and twelve. Mathematics teachers experienced various problems with the implementation of the new curriculum due to a lack of proper planning of the implementation process. For solving the above mention problems refreshment training should be conducted from time to time, school administration should manage the necessary equipment for teachers, Government of Nepal should supply the essential training about implementing the new curriculum and frequent short time training, as well as mathematics training should be organized for teachers for their better professional development.

Further, the findings of the study show that some teachers have limited knowledge on the understanding of the implication of new curriculum management strategies. The SMC cannot achieve this without the support of the teachers, and the teachers cannot achieve without the support of the SMC. Therefore, both of need to work together toward the attainment of the goal for implement the new curriculum. All the education stakeholders have to be involved for new curriculum management to be effective. Principals as change agents working together with the other SMC members are responsible for ensuring that effective new curriculum implementation is taking place in their schools. Proper training should be offered to SMC first before a curriculum is introduced so that they can be able to deal with curriculum implementation. Therefore, SMC knows their role in managing the new curriculum, and problems that they experience in schools inhibit them from effectively executing them.

### **Implications of the Study**

The major implication filed of this study concerns educational and policy fields. Therefore, the main implications of this study are listed as follows;

- ) It helps to identify the problems faced by teachers in implementing the new curriculum in grade eleven and twelve.
- ) It helps to find out the ways/strategies to reduce the teachers' problems in implementing of the new curriculum.
- ) It is helpful to curriculum planners, policymaker, and administrator educationist, mathematicians to make further rules, regulations and policy.
- ) This study helps to find the actual situation of the classroom teaching performance of secondary-level mathematics teacher in Kathmandu district.

- ) This study helps to give suggestions for the improvement in a solution of the problems.
- ) It is useful for those teachers who are a beginner in their teaching career they may take benefit from this research.

### **Recommendations for Further Study**

Some recommendations for further study/research in this field are listed as follows;

- ) Similar studies can be conducted on the challenges faced by teachers at a basic level.
- ) Similar studies can be carried out by only taking some teachers and then using narrative studies in different parts of Nepal.
- ) Some studies can be related to comparing the challenges between Terai regional and Himali regional teachers in implementing new curriculum
- ) Some studies can be related to comparative studies of challenges faced by male and female teachers in implementing the new curriculum at any level.

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## Appendices

### Appendix A

#### Name List of the Selected Schools

| S. N | Name of Schools                      | Address             |
|------|--------------------------------------|---------------------|
| 1    | Shree Mangal Secondary School        | Kirtipur            |
| 2    | Shree Panga Secondary School         | Panga, Kirtipur     |
| 3    | Shree Hill Town Secondary School     | Kirtipur            |
| 4    | Shree Laboratory Secondary School    | Kirtipur            |
| 5    | Shree Bright Future Secondary School | Chandragiri, Naikap |
| 6    | Shree Motherland Secondary School    | Chandragiri, Naikap |
| 7    | Shree Janapath Secondary School      | Kalanki             |
| 8    | Shree Landmark Secondary School      | Kalanki             |
| 9    | Shree Gyanodaya Secondary School     | Kalanki             |
| 10   | Shree Ganga Secondary School         | Kalanki             |

## Appendix B

### Name List of the Selected Mathematics Teachers for Interview

| S. N | Name of Teachers   | Name of Schools                  |
|------|--------------------|----------------------------------|
| 1.   | Mahendra Maharjan  | Mangal Secondary School          |
| 2.   | Gyanendra Shrestha | Panga Secondary School           |
| 3.   | Navaraj Thapar     | Bright Future Secondary School   |
| 4.   | Ganesh Shrestha    | Shree Janapath Secondary School  |
| 5.   | Mukesh Yadav       | Shree Gyanodaya Secondary School |

## **Appendix C**

### **Closed Ended Questionnaires**

Dear informant,

I am a thesis student at the Masters' level in Mathematics Education. I am conducting the research entitled "Problems Faced by Mathematics Teachers in Implementation of the New Curriculum at grade XI & XII" under the supervisor on Asst. Prof. Krishna Prasad Adhikari, Central Department of Mathematics Education, Kirtipur Kathmandu. So, I humbly request you to put your responses to the questions included in this set of questionnaires. The fruitfulness of the study will depend on your reliable and genuine information. I honestly assure you that the responses will remain confidential and be used only for research purposes. I will be indebted to you for your invaluable contribution to completing this research work.

Thank you!

**Researcher**

**Nirmala Nagarkoti**

Name of Teacher:

Gender:

Name of School:

Teaching Experience:

*Note: SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree,*

*SD=Strongly Disagree*

**Please tick ( ) anyone and only one of each row;**

| S. N | Statement                                                                                                             | SA | A | U | D | SD |
|------|-----------------------------------------------------------------------------------------------------------------------|----|---|---|---|----|
|      | <b>Problems Related to School Administration</b>                                                                      |    |   |   |   |    |
| 1.   | Our school administration is irresponsible to manage and construct necessary teaching materials.                      |    |   |   |   |    |
| 2.   | It is a compulsion for me to take extra periods due to insufficient mathematics teacher.                              |    |   |   |   |    |
| 3.   | Lack of refreshment training to teach difficult and rigor topics.                                                     |    |   |   |   |    |
| 4.   | Lack of amenities and award for appropriate performance.                                                              |    |   |   |   |    |
| 5.   | There is math lab or library in our school for practicing mathematical activities.                                    |    |   |   |   |    |
| 6.   | The administration often supports economics and physical to construction and purchase in implementing new curriculum. |    |   |   |   |    |

|                                               |                                                                                                           |  |  |  |  |  |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 7.                                            | The administration has provided me with sufficient leisure period to construct lessons plans.             |  |  |  |  |  |
| 8.                                            | Lack of technical support.                                                                                |  |  |  |  |  |
| 9.                                            | Lack of facilities and award for good performance.                                                        |  |  |  |  |  |
| <b>Problems Related to Teachers' Training</b> |                                                                                                           |  |  |  |  |  |
| 10.                                           | There is no training schedule about how to teach the new curriculum's content in the classroom.           |  |  |  |  |  |
| 11.                                           | A training plan/schedule is organized in our school for teachers to improve teaching-learning activities. |  |  |  |  |  |
| 12.                                           | A Refresher course (training) is organized frequently for us.                                             |  |  |  |  |  |
| 13.                                           | I have not participated in any seminar conducted on mathematics yet.                                      |  |  |  |  |  |
| 14.                                           | Training is not based on need and demand; it is only for formality and up-grading.                        |  |  |  |  |  |
| 15.                                           | I deliver the knowledge and teaching strategies in the class-room whatever I have                         |  |  |  |  |  |

|                                                                              |                                                                                                         |  |  |  |  |  |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|                                                                              | learned in the training program.                                                                        |  |  |  |  |  |
| 16.                                                                          | The trainers are not very good at content to deliver the training.                                      |  |  |  |  |  |
| 17                                                                           | Trainers are not well experienced and skilful in the use of the new curriculum to deliver the training. |  |  |  |  |  |
| <b>Problems Related to Technology for Gaining new Curriculum Information</b> |                                                                                                         |  |  |  |  |  |
| 18.                                                                          | Lack of adequate internet access to search for new information related to new curriculum.               |  |  |  |  |  |
| 19.                                                                          | Using technology is not easy for gaining content information without training.                          |  |  |  |  |  |
| 20.                                                                          | Lack of timely feedback from the instructor during new curriculum implementation training.              |  |  |  |  |  |
| 21.                                                                          | Lack of technical and educational ability in mathematics education                                      |  |  |  |  |  |
| 22.                                                                          | Unfamiliar with the use of technology for gaining new knowledge about mathematics new curriculum.       |  |  |  |  |  |
|                                                                              |                                                                                                         |  |  |  |  |  |

| <b>Problems Related to Teachers' Motivation</b>               |                                                                                                                              |  |  |  |  |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| 23.                                                           | Lack of teacher motivation to involvement in new curriculum planning.                                                        |  |  |  |  |
| 24.                                                           | Physical infrastructure is not sufficient for effective teaching and learning activities.                                    |  |  |  |  |
| 25.                                                           | Lack of opportunity to participate in interactions workshop and refreshment training to teach difficult and rigorous topics. |  |  |  |  |
| 26.                                                           | Low salary is one of the causes of the problem in teaching mathematics.                                                      |  |  |  |  |
| <b>Problems Related to Political Activities in the School</b> |                                                                                                                              |  |  |  |  |
| 27.                                                           | Does school political activities are affected by implementing a new curriculum in the classroom?                             |  |  |  |  |
| 28.                                                           | Are you involved in any political activities?                                                                                |  |  |  |  |
|                                                               |                                                                                                                              |  |  |  |  |
| 29.                                                           | There is a challenge to the implication of the new curriculum at the secondary level.                                        |  |  |  |  |
| <b>Problems Related to Students' Activities</b>               |                                                                                                                              |  |  |  |  |



|                                                    |                                                                                                 |  |  |  |  |  |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 30.                                                | Lack of prior knowledge creates problems in teaching new mathematical content.                  |  |  |  |  |  |
| 31.                                                | Social & cultural background of the students' effect on the teaching-learning process.          |  |  |  |  |  |
| 32.                                                | It is difficult to manage teaching and learning due to individual differences.                  |  |  |  |  |  |
| 33.                                                | The medium of language affects in implementation of the new curriculum in teaching mathematics. |  |  |  |  |  |
| 34.                                                | There is an age effect on students for mathematics learning.                                    |  |  |  |  |  |
| 35.                                                | The new mathematics curriculum is considered most difficult, useless and boring.                |  |  |  |  |  |
| <b>Problems Related to Curriculum and Textbook</b> |                                                                                                 |  |  |  |  |  |
| 36.                                                | The mathematics new curriculum is not practicable.                                              |  |  |  |  |  |
| 37.                                                | The mathematics new curriculum does no longer healthy with the existing situation.              |  |  |  |  |  |
| 38.                                                | The mathematics new curriculum does not match the age, ability, interest, and needs of          |  |  |  |  |  |

|                                                                     |                                                                                                                                           |  |  |  |  |  |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|                                                                     | students.                                                                                                                                 |  |  |  |  |  |
| 39.                                                                 | The subject matter of the mathematics new curriculum is itself difficult.                                                                 |  |  |  |  |  |
| 40.                                                                 | The verbal problem of textbooks is not related to students' daily life.                                                                   |  |  |  |  |  |
| 41.                                                                 | The examples covered in the textual content e-book are no longer sufficient.                                                              |  |  |  |  |  |
| <b>Perception of teachers towards an internal assessment system</b> |                                                                                                                                           |  |  |  |  |  |
| 42.                                                                 | In the new curriculum, the assessment and overall education is transparent in mathematics in grade XI & XII                               |  |  |  |  |  |
| 43.                                                                 | More weightage to internal assessment create the positive incentive for mathematics students for the continuous study.                    |  |  |  |  |  |
| 44.                                                                 | The grading system is familiar to teachers and students.                                                                                  |  |  |  |  |  |
| 45.                                                                 | The teacher provides regular reflective feedback on students' assignment examinations and reduced their negative wash-back effectiveness. |  |  |  |  |  |

|                                                  |                                                                                                                        |  |  |  |  |  |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 46.                                              | There is a gap between the formative and summative evaluation system.                                                  |  |  |  |  |  |
| <b>Overloaded content of new curriculum.</b>     |                                                                                                                        |  |  |  |  |  |
| 47.                                              | The content of the mathematics new curriculum is relevant to the present need of students and the context.             |  |  |  |  |  |
| 48.                                              | The arrange of mathematics credit hours in the new curriculum is appropriate.                                          |  |  |  |  |  |
| 49.                                              | The new mathematics curriculum included project work, fieldwork and tutorials as learning approaches.                  |  |  |  |  |  |
| 50.                                              | The content of the mathematics new curriculum is locally and globally popular.                                         |  |  |  |  |  |
| 51.                                              | The new mathematics content of the new curriculum has been able to incorporate recent trends in teaching and learning. |  |  |  |  |  |
| <b>Problem related professional development.</b> |                                                                                                                        |  |  |  |  |  |
| 52.                                              | Lack of opportunities to participate in training related to new curriculum implementation.                             |  |  |  |  |  |

|     |                                                                                                        |  |  |  |  |  |
|-----|--------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 53. | Lack of information about new instructional techniques and invention.                                  |  |  |  |  |  |
| 54. | Lack of time to study related reference materials.                                                     |  |  |  |  |  |
| 55. | Lack of opportunity to participate in the interactions and workshops related to the subject's matters. |  |  |  |  |  |
| 56. | Lack of content knowledge when the new curriculum is implemented without training.                     |  |  |  |  |  |

## Appendix D

### Interview Guidelines for Mathematics Teacher

Name..... Qualification.....

Age..... Sex.....

Teaching Experiences..... Training.....

School's Name.....

The interview with the Mathematics teacher would take on the following main topics;

- ) Classroom management: Physical facility, school environment, Classroom space
- ) Mathematical Instruction, Material and Methods: Methods, Encouragement, Relative questions, Materials, and Lesson Plans.
- ) Effectiveness of teacher's training in mathematics learning.
- ) Mathematical conferences, seminars, and other mathematical program
- ) Teacher and student's behaviour in the classroom
- ) Problems in implementing the new curriculum in the classroom
- ) Opportunities in implementing the new curriculum in the classroom
- ) Any opportunities for teachers training in implementing the new curriculum
- ) Effectiveness of changed new curriculum at the secondary level

## **Appendix E**

### **Classroom Observation Format**

Name of school:

Students' participation:

Date of observation:

Topic:

The mathematics classroom observation was taken in terms of the following main points;

- ) Teacher's teaching style, method, and materials.
- ) Interaction between students-students and teacher-students in the classroom.
- ) Collaboration and discussion of subject matter with students.
- ) Classroom environment and management.
- ) Classwork and Homework
- ) Participation of students in classroom activities
- ) Students' interest in related topic/content
- ) Relations between to each other students

## Appendix F

### Statistical Formula Used in Data Analysis

#### Mean

The sum of a set of numbers is divided by the number of numbers in the set. The mean is found by adding up all of the given data dividing by the number of data entries.

$\bar{x}$  = is the mean of set of x values.

$\Sigma x$  = Represents the sum of all the x values.

n = is the number of x values.

$$\text{Mean Weightage } X = \frac{\text{Total Rank Score of a Statement}}{\text{No. of Teacher's Responses}}$$

$$\text{Percentage } X = \frac{\text{Total No. of Response Teachers}}{\text{No. of Teacher's Responses}} | 100$$