

**Problem Faced by Mathematics Teachers in Teaching Mathematics at
Secondary Level**

A

Thesis

By

Sabina Shrestha

**For The Partial Fulfilment of the Requirement for the Degree of Master of
Education**

To

Department of Mathematics Education

Central Department of Education

University Campus Tribhuvan

University Kirtipur,

Kathmandu

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Letter of Certificate

This is to certify that Mrs. Sabina Shrestha, student of the academic year 2076/077, campus Roll No. 119, Exam Roll No.7628206 thesis number 1847 and T.U Regd. No 9-2-375-234-2015 has completed her thesis under the supervision of Mr. Ram Chandra Ghimire during the period prescribed by the rule and regulations of Tribhuvan University, Kathmandu Nepal. This thesis is entitled " Problem Faced by Mathematics Teachers in Teaching Mathematics at Secondary Level" Embodies the result of her investigation. I hereby Recommend and forward that this thesis be submitted for the partial requirements to award the Degree of Master Education.

.....

Mr.Abatar Subedi

(Head)

Letter of Approval

This thesis entitled " Problem Faced by Mathematics Teachers in Teaching Mathematics at Secondary Level " submitted by Mrs. Sabina Shrestha in partial fulfillment of the requirement for the Master's Degree in Education has been approved.

Viva Voice Committee

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Recommendation for Acceptance

This is to certify that Mrs. Sabina Shrestha as completed her Master in Mathematics Education thesis entitled " Problem Faced by Mathematics Teachers in Teaching Mathematics at Secondary Level." under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu Nepal. I recommend and forward this thesis to the department of mathematics Education to organize the final viva-voice.

.....

Mr. Ram Chandra Ghimire

(Supervisor)

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Dedication

To my family who developed a Great Span of their life Under very much difficult circumstances to make me what I am now.

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 authors except acknowledgment has been made.

.....
Sabina Shrestha

Date:

Acknowledgment

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.....

Sabina Shrestha

Abstract

The objectives of this research were to identify the problems faced by mathematics teachers in teaching mathematics and to find remedies for these problems. In this study, the researcher employed a descriptive survey design. Forty secondary-level mathematics teachers were selected, and from those forty teachers, four were chosen for interviews. The basis for selecting these four teachers was the sample design of this study, which utilized the stratified sampling method. For the collection of primary data, the researcher used a questionnaire and interview schedule. Statistical analysis and interpretation were conducted using the weighted mean as the primary statistical tool. Additionally, data obtained from interview schedules were analyzed descriptively.

Based on the field survey and statistical analysis of the gathered data, several challenges faced by secondary-level mathematics teachers were identified. The findings of this study indicate that the quality of mathematics education in Nilakantha Municipality, Dhading, is unsatisfactory, largely due to the numerous challenges faced by teachers. These challenges stem from students' diverse backgrounds, insufficient teacher training, limitations in instructional methods and materials, ineffective school administration, and students' lack of engagement.

To address these challenges, regular refresher training should be conducted, and the school administration must take proactive steps to manage the necessary equipment for both teachers and students. Teachers should be encouraged to utilize available materials effectively, and additional mathematics classes should be organized. It is essential for teachers to understand each student's background and tailor their approach accordingly, while the school administration should implement mechanisms to recognize and reward exemplary teacher performance.

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Chapter I

Introduction

Background of the Study

Mathematics serves as the backbone of our civilization, encompassing the study of quantity, structure, and change. With a crucial role in the development of science and technology, mathematics is indispensable for understanding every discipline. Initially devised to fulfill human needs, it later found its way into formal education systems.

Teaching mathematics involves a sequential process of imparting mathematical knowledge from more knowledgeable individuals to less knowledgeable ones, employing appropriate teaching methods and materials. Bhatia and Bhatia (1987) emphasize the importance of active learning in mathematics, highlighting its practical nature.

The primary aim of mathematics instruction is to cultivate understanding, reasoning, and analytical skills crucial for various facets of human civilization and development. Teaching mathematics entails guiding learners in acquiring new mathematical knowledge based on their existing knowledge and experiences, under the guidance of educators. Instructional challenges in mathematics refer to obstacles hindering the learning process (Bhat, 2017).

Teachers encounter numerous challenges in teaching mathematics, spanning content, teaching activities, students' backgrounds, interests, and participation, classroom management, school administration, and teacher training. Establishing a harmonious relationship among students, teachers, and the subject is essential for effective teaching. Pandit (2001) underscores various factors disturbing mathematics

education in Nepal, including teacher involvement in curriculum planning, inefficiency in teaching practice supervision, and inadequate resources.

The school administration plays a pivotal role in fostering a conducive learning environment through the provision of physical resources, organizational discipline, and resolution of causal issues. A weak administration undermines the learning environment and compromises outcomes. Effective classroom management is vital for meaningful teaching, while student interest and participation are pivotal in mathematics learning.

Teaching is a skillful endeavor, requiring teachers to undergo training and apply acquired knowledge and skills in the classroom. Instructional methods and materials are central to teaching and learning processes, with teachers serving as key agents. Lack of prior content knowledge poses another challenge for teachers.

Despite extensive efforts by government and non-government entities to identify teaching problems in mathematics, satisfactory solutions remain elusive. The researcher, a secondary level mathematics teacher facing numerous challenges, recognized the necessity of investigating teaching and learning problems in mathematics education at the secondary level.

Statement of the Problem

Mathematics, often referred to as the "queen of all sciences" according to Gauss (1856), holds a pivotal role in science and technology. Nepal, being a multicultural, multilingual, and multi-religious country, presents a diverse educational landscape. With 123 Nepalese languages spoken as mother tongues and 125 caste and ethnic groups, including 63 indigenous peoples, 59 castes (including 15 Dalit castes), and three religious groups (including the Muslim group), classrooms boast students

from various backgrounds. Navigating this diversity presents a challenge for teachers in addressing individual capacities and needs. Furthermore, the scarcity of teaching materials exacerbates the situation, compounded by the inadequate utilization of available resources by only a few teachers. Proper utilization of materials necessitates teacher training, which, unfortunately, is insufficient and lacks adequate refreshment opportunities. Even trained teachers often fail to apply their knowledge in classroom activities due to a dearth of materials. The school administration bears significant responsibility in maintaining a conducive learning environment by providing adequate physical resources. Weak administration undermines this environment, leading to subpar outcomes. Mathematics is perceived as a difficult and uninteresting subject by students, contributing to their disengagement and passive participation in learning. This study is dedicated to exploring the problems faced by secondary level mathematics teachers and proposing remedies.

Objective of the Study

The objectives of this study were:

-) To identify the problems faced by mathematics teacher in teaching mathematics at secondary level.
-) To find out the remedies of the problems faced by the mathematics teacher in teaching mathematics at secondary level.

Research Question

This research addressed the following research questions:

-) What are the difficulties encountered by mathematics teachers in teaching mathematics at secondary level?

-) What are the solutions to the problems faced by mathematics teachers in teaching mathematics at secondary level?

Significance of the Study

Mathematics constitutes an indispensable component of the school curriculum, mandated as a compulsory subject across all levels of education. Additionally, at the secondary level, mathematics is offered as an optional subject. However, mathematics teachers encounter numerous challenges in their teaching endeavors, often stemming from inadequate familiarity with effective teaching materials and classroom management techniques. This study plays a crucial role in identifying these challenges, thereby holding significant implications. By shedding light on the problems faced by mathematics teachers, this research is poised to offer invaluable insights that can inform relevant authorities and facilitate the enhancement of mathematics education at the secondary level. Furthermore, it stands to benefit untrained teachers, particularly by aiding in their professional development. The study's significance is articulated as follows:

-) The findings of this research can serve as a resource for policymakers seeking to address teachers' concerns.
-) By pinpointing solutions to the challenges encountered by mathematics teachers, this study contributes to the improvement of teaching practices.
-) This research endeavor fosters the creation of a conducive environment for parents and relevant administrative bodies by addressing pertinent issues in mathematics education.

Delimitation of the Study

The delimitations of the study were as follows:

-) It was delimited to Nilkantha municipality, Dhading district.
-) The study was restricted to secondary level mathematics teachers.
-) The study constrained to forty secondary level mathematics teachers.
-) The study concerned only with classroom teaching problems in grades nine and ten.

Definition of Related Term

Different words can give different meaning according to the context in which they are used. Hence researcher feel it is necessary to define following terms which were frequently used in this research work.

Problem. Problem refers to the challenges encountered by secondary level mathematics teachers in various areas, including students' background characteristics, teacher training, students' interest and participation, instructional methods and materials, and school administration.

Student. Student refers to those students who are studying in Secondary level at Nilkantha municipality, Dhading.

Secondary school mathematics teacher. The teacher who teaches mathematics at grade IX and X.

Trained teacher. The teacher who have passed bachelor or higher level in mathematics education or were taken 10 months training provided by MOE or NCED or FOE as trained teachers.

Untrained teacher. Teachers holding a bachelor's degree or higher in any field of mathematics other than education and who have not undergone the 10-month training provided by MOE, NCED, or FOE are classified as untrained teachers.

Chapter II

Review of Related Literature

The literature review was the study of research done by other people closely related to the researcher's topic of study. The main purpose of reviewing related literature was to find out what works had been done so far in the area of the study being undertaken. It guided how to carry out the research from beginning to end. It helped to find related theories, frame the theoretical and conceptual framework, and assisted in selecting appropriate designs, tools, and techniques. It also provided ideas for data collection and analysis. Within this assumption, some works on the related topic were presented.

Empirical Review

Thapa (2005) conducted a thesis entitled "A study on the problem faced by teacher in teaching mathematics at primary level". She came to the conclusion that a number of issues, including huge class sizes, outdated teacher guides, a dearth of teaching resources, a lack of supervisory support, and others, are causing teachers to struggle. Teaching strategies are those useful tools that help make a math lesson engaging, clarify the material, and help the student learn the material by heart. Pattern outcomes and prevention against others are terms used in instructional practices. There are various teaching strategies, some of which are highlighted in the best teacher resource. Among these, the project method, field trip method, inductive technique, discussion method, and field trip method all place a strong emphasis on the students' active participation.

Baral (2008) in the study, "Problem faced by Mathematics teacher in teaching mathematics" indicated that there were number of problems relate to curriculum

designing, textbook writing, teaching method, classroom situation, students background, teaching materials, teachers training and so on.

Ojha (2011) conducted a thesis entitled "A study on the problem faced by mathematics teachers in teaching mathematics at secondary level". He came to the conclusion that the majority of issues are caused by big class sizes, a teacher's guidebook that is out of date in relation to their demands, a lack of instructional resources, inadequate training for instructors, a lack of supervisory support, a lack of physical facilities, etc.

Khanal (2012) conducted a thesis entitled "A study on the problem faced by teacher in teaching mathematics at higher secondary level" and found that there were insufficient student engagement rates in math classes, a deficiency in moral education, a lack of parent-teacher associations, and a lack of administrative backing for the creation of math resources. Teachers face challenges in teaching mathematics at the upper secondary level due to a variety of factors, including the use of students in political programs, a result-oriented system that makes teaching difficult, a lack of friendly relationships between teachers and students, a lack of preparation and confidence on the part of the teacher, a lack of appropriate teaching methods, a lack of diagnostic tests and oral exams, a lack of supervision, opportunities to participate in mathematical conferences and seminars, a lack of political support for the educational sector, and a lack of parental responsibilities.

Bhatt (2013) conducted thesis entitled "Problem faced by teacher in teaching mathematics at secondary level in Kanchanpur district". The objectives of his study is to find the problems faced by teachers in teaching mathematics at secondary level and to compare the problem faced by public and private school's mathematics teachers in

teaching mathematics at secondary level. Descriptive survey method is adapted to conduct the study and open questionnaire, classroom observation and interview schedule were used of data collection. For forty secondary mathematics teachers from Kanchanpur district were selected with lone teacher from each school by method of stratified random sampling. Twenty private schools from 48 private schools and twenty public schools from 117 public schools were chosen as a sample by him. Using the stratified random sample method, forty secondary mathematics instructors from the Kanchanpur district were chosen for this study, one teacher from each school. Before the data was analyzed, the weighted mean was used to determine where the responses to the rating scale's central position for teachers and students as a whole fell, and the t-test was used to determine whether secondary mathematics teachers in public and private schools faced different challenges. The five percent significance level was used to examine the difference. He thinks that the teacher was dealing with a lot of issues pertaining to the negative viewpoints in the classroom.

Machaba (2013) conducted a research in "Teacher challenges in the teaching of mathematics at foundation phase". The purpose of the study was to determine which research methods, specifically observation, interviewing, and document analysis, were most appropriate for the problem at hand. The investigation's findings showed that because of the school's multilingual curriculum, it was challenging to help every child who had arithmetic difficulties. Time was another barrier that kept teachers from spending enough time helping students with their math problems. Instructors were required to invest in intervention programs offered by the Department of Basic Education, which were designed to enhance education in general. Teacher could not make additional time that could afford children for the opportunities of individual attention. The research recommended that the teacher

should use whole class teaching approach in teaching and also teacher use a variety of teaching method in order to accommodate all children and also encourage children to use concrete object.

Sapkota (2014) conducted a thesis on "Problems faced by teachers in teaching mathematics at lower secondary level". His study's primary goals were to examine the issues urban and rural school instructors encountered when teaching mathematics at the lower secondary level and to identify the challenges experienced by educators in this regard. His research focused on the district of Kavreplanchok. He conducted a survey study. The 50 community school math teachers at the lower secondary level who taught math until 2069 in the Kavrepalanchok area served as the study's sample. Using random sampling techniques, 40 of the 50 teachers were chosen from rural schools and 10 from metropolitan schools. The weighted mean analysis of the gathered data was utilized to determine the center position of the responses to the assertions of the quantitative data through questionnaire was analyzed and interpreted descriptively and to compare the response of urban and rural school teachers, the t-test was used the t-test was calculated at the 5% level of significance. He concluded that there are many problems facing by the teachers of lower secondary school level due to the student's activities, teacher's physical facilities, teaching methods and materials, curriculum and text books, evaluation techniques. Also, it can be concluded that both urban and rural school mathematics teachers have been facing more or less similar type of problems.

Poudel (2015) conducted a thesis entitled "Problem faced by mathematics teacher at higher secondary level" and It was determined that the majority of the teachers exhibited poor moral education, an administrative economic crisis, a lack of supervision, an unsuitable learning environment, a lack of awareness on the part of

the students in mathematics classes, an absence of suitable lesson plans and resources, low student participation, and a lack of preparation for school. Teachers with training and expertise were not applying what they knew. There were no mathematical conferences, seminars, or other events.

Rijal (2014) in his study tried to explore “Problems faced by higher secondary level mathematics teacher in curriculum implementation”. This study is both quantitative and qualitative in nature. The researcher will utilize the following methods to gather data: interview instructions and a questionnaire. 42 math teachers who taught in grade eleven across all higher secondary schools in the Salyan district were included in the study as a sample. Consequently, the researcher discovered that the execution of the curriculum at the upper secondary level was hindered by the students' backgrounds, the classroom atmosphere, and a lack of reference teaching materials.

Paudel (2015) in her study “Problem faced by mathematics teachers at higher secondary” tried to find the cause of the problem which are faced by mathematics teacher at higher secondary level of Ramechhap district. For convenience, the study was conducted using a descriptive survey approach. The study's design was quantitative in nature. Use the following tools to gather data for the researcher: an interview schedule, an observation form, and a questionnaire. She chose thirty teachers at the upper secondary school level for her study. She discovered the following issues as a result: issues with classroom management; issues with teaching mathematics; issues with methods and materials; issues with the medium of instruction; issues with teacher proficiency and professional development; issues with teacher preparation and its application to the classroom; issues with evaluation.

Bowling and Ball (2018) studied “Alternative Certification: A Solution or an Alternative Problem” in America. The study revealed that most alternative certified teachers were found to possess abundant technical skill within their discipline, but were lacking in the basic needs found necessary to operate effectively in the classroom. When testing specific pedagogical and program management skills, alternatively qualified instructors seemed to be significantly at a disadvantage due to their lack of participation in regular teacher education programs. According to certain data, the needs of first-year teachers with traditional certification and those with alternative certification are comparable, as seen by their requests for professional development. It might be challenging to determine whether an alternatively qualified teacher is sufficiently versed in the norms and culture of the field to fully comprehend the requirements of their students. Programs that engaged newly certified alternatively qualified teachers in the canons of discipline were necessary, given the absence of awareness regarding their knowledge gaps.

Rose and Sughrue (2019) studied “Promoting Retention of Alternative Certified Teachers Through Professional Development” in America. According to the survey, school administrators believed they understood the difficulties, training paths, and certification standards for non-traditionally qualified teachers. This assertion was made by both alternative certified teachers and school leaders. But given their training, school administrators' expectations for inexperienced alternative certified teachers' performance were excessively high and unrealistic. For example, they expected the licensed alternative teachers to possess the pedagogical knowledge and skills necessary for high-quality training.

Research Gap. Through an extensive review of the literature, several critical issues related to mathematics instruction and learning have emerged. These issues

span a range of factors, including classroom management, the diverse backgrounds of students, teaching methodologies, instructional materials, and gaps in content knowledge. Despite the wealth of research exploring these challenges, a significant gap remains in addressing practical solutions to these problems. Furthermore, there is a marked scarcity of studies focusing on students' low interest and participation in mathematics, as well as deficiencies in teacher preparation.

This research aims to bridge these gaps by delving into specific challenges encountered by mathematics teachers. It examines areas such as student engagement, teacher training, school administration, and the effectiveness of instructional materials and teaching strategies. By focusing on these aspects, the research seeks to uncover both the underlying issues and potential remedial solutions. Moreover, while previous studies have investigated these issues in various regions, there has been no dedicated research in Nilakantha Municipality, Dhading. This lack of localized research highlights an important gap in understanding the unique challenges faced by rural areas. Therefore, this study addresses the availability and utilization of technical materials in Nilakantha Municipality, aiming to provide insights and solutions that are relevant to similar rural contexts. By doing so, this research contributes valuable knowledge to the field and offer practical recommendations for improving mathematics education in under-researched areas.

Theoretical Review

The constructivism theory informed the creation of this paper. Constructivism is a theory of cognitive learning that places special emphasis on the way in which people reason in order to arrive at decisions and actions (Acharya, 2015). Thus, when learning mathematics, a student connects previously learned patterns to generate new

ones. According to the constructivist philosophical perspective, learning happens by discussion and compromise. Vygotsky proposed that cognitive functions originate in social interaction, emphasizing that learning involves more than just assimilating and accommodating new knowledge. Instead, it is a process of integrating learners into a knowledge community, with language and culture playing vital roles in cognitive development. According to Vygotsky, knowledge is co-constructed rather than simply constructed, with the zone of proximal development (ZPD) being a key concept. The ZPD represents the gap between a student's ability to perform a task independently and their ability under adult guidance. It encompasses cognitive structures still maturing, which require guidance or collaboration for further development.

Constructivist teaching, based on constructivist learning theory, posits that learning occurs through active engagement in knowledge construction rather than passive reception of information. In a constructivist classroom, instruction is active, student-centered, and inquiry-based, characterized by open-ended questions, group work, research, exploration, and alternative assessments such as portfolios and teacher-written narratives. Constructivism is rooted in observations and scientific studies of how people learn, suggesting that individuals construct their own understanding and knowledge through experiences and reflection. In the constructivist approach, the teacher serves as a scaffolder, supporting students' learning processes.

This theory emphasizes the active engagement of students in teaching and learning activities, with the teacher serving as a facilitator or guide. However, traditional teaching strategies often result in passive learning for students, where the teacher solves problems and chalk-and-talk methods fail to address the needs and interests of children. Teachers may struggle to implement new knowledge and teaching strategies gained from training due to insufficient knowledge, lack of

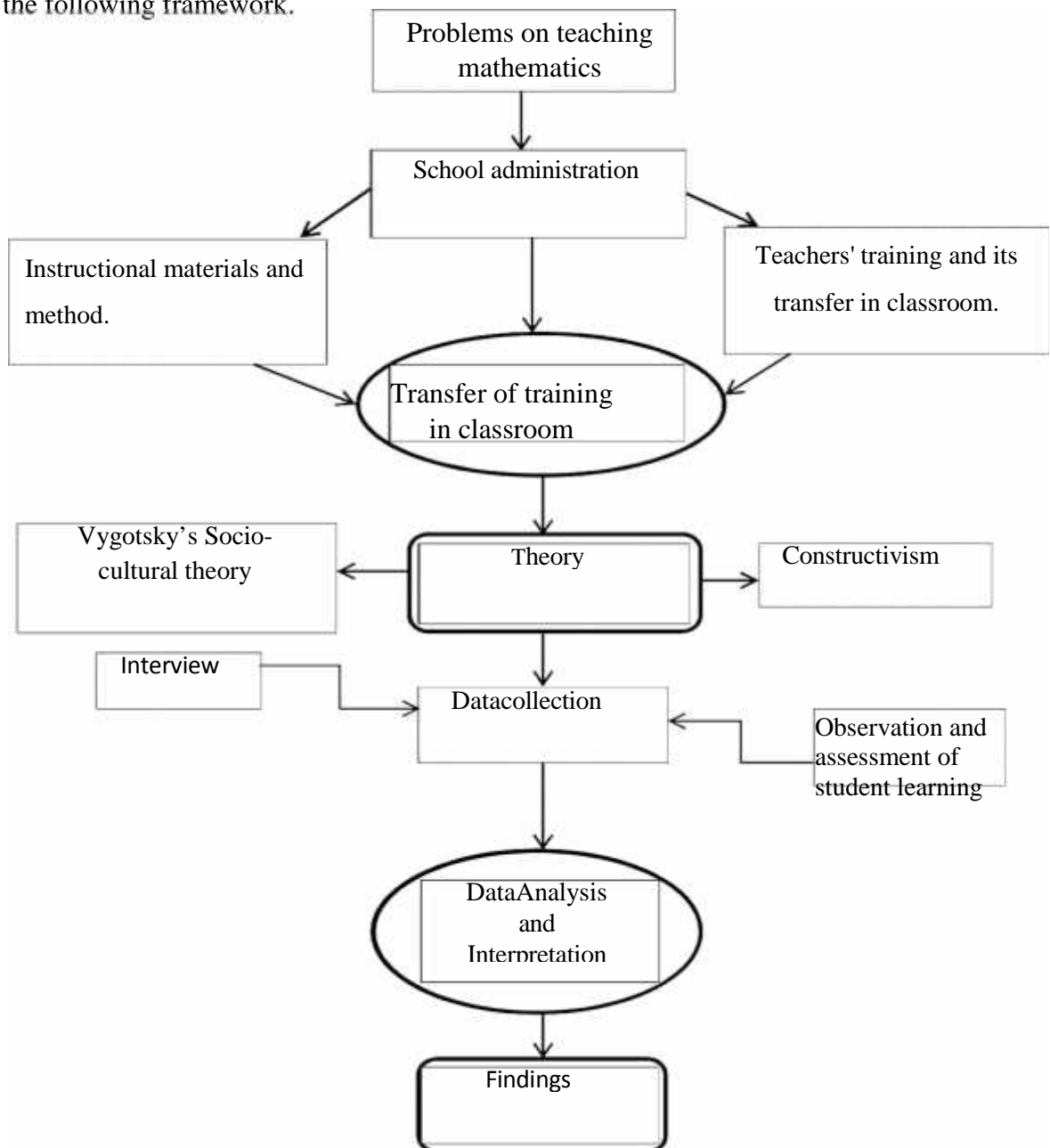
support, and administrative challenges, resulting in teaching and learning activities becoming less effective.

Through literature review, the researcher identified various problems in teaching and learning mathematics, spanning content, student backgrounds, teaching methods and materials, classroom management, and lack of prior content knowledge. While many researchers have investigated these issues, few have focused on finding solutions. Additionally, there is limited research on addressing student disinterest and participation in mathematics learning, as well as teacher training problems.

This research aims to identify the problems faced by mathematics teachers in areas such as student interest and participation, teacher training, school administration, instructional materials, and teaching strategies. Moreover, it seeks to propose remedial solutions to address these various challenges.

Conceptual Framework

This study was focused on identifying the problems and remedies for mathematics teachers in teaching mathematics. Drawing from a review of various related literature and theoretical frameworks, the researcher concluded and outlined the following framework.



The research framework begins with the identification of the problems in teaching mathematics. The study highlights several issues faced by mathematics teachers, which stem from various sources such as school administration, the availability and use of instructional materials, the effectiveness of teaching methods, and the adequacy of teacher training. These factors collectively contribute to the challenges teachers encounter while delivering mathematics lessons effectively.

Another key aspect of the study was the focus on teacher training and its transfer into classroom practices. The success of training programs depends on how well teachers are able to apply the knowledge and techniques they have learned in real classroom situations. The framework emphasizes that the proper transfer of training is essential for overcoming the barriers teachers face in their teaching practice.

The theoretical foundation of the study is based on two major educational theories: Vygotsky's Socio-Cultural Theory and Constructivism. Vygotsky's theory stresses the importance of social interactions and scaffolding in the learning process, suggesting that teachers need to create a supportive environment where students can learn through guided interactions. Constructivism complements this by asserting that learners construct knowledge through experience and reflection. Both theories guide the study's analysis of teaching practices and offer insights into how teachers can create more effective learning environments.

Finally, the data collected is subject to analysis and interpretation, which enables the researcher to identify the key problems and propose potential remedies. Through this process, the study offers a comprehensive understanding of the difficulties faced by mathematics teachers and provides practical recommendations for improving the quality of mathematics education in the context of the study.

Chapter III

Methods and Procedure

This chapter dealt with the procedure of the study, which was carried out to achieve the objectives of the study. The study was a descriptive survey research with a systematic and analytical nature. The study was concerned with the problems faced by mathematics teachers in teaching mathematics at the secondary level. This chapter comprised the design and method of the study, population, sample, and sampling strategies, data collection tools and techniques, data collection procedures, and the process of data analysis and interpretation.

Research Design

This study was about the problems faced by mathematic teachers in teaching mathematics at the secondary level. The design of the study was a descriptive survey. Surveys are commonly used descriptive methods in educational research and may vary in scope from large-scale governmental investigations to small-scale studies carried out by a single researcher (Cohen and Manion, 1985, as cited in Bhatt, 2017, p.15). Most surveys were based on samples of specified target populations. The researcher often aimed to generalize the results obtained from the sample to the population from which the sample was drawn.

Population of the Study

The study focused on all mathematics teachers working in secondary schools within Nilkantha Municipality, Dhading District. This group constituted the population for the research approach was designed to capture a diverse perspective on mathematics education across Nilkantha Municipality.

Sample of the Study and sampling procedure

According to records from the Education Department of Nilkantha Municipality, there were 33 secondary school within the municipality. In these school, there were 72 secondary level mathematics teachers in total. From this total, 40 teachers were selected for the study. Among these 40 teachers, four were chosen for in-depth interviews. The selection of these four teachers was guided by the study's stratified sampling method. Out of the 40 selected teachers, 20 were from rural areas and 20 were from urban areas. To ensure a balanced representation, the sample included 50% of teachers from urban schools and the remaining 50% from rural schools. Similarly, out of four selected teachers for interview, two were chosen from private school and two were from government school.

Data Collection Tools

For the collection of primary source of data, the researcher used the questionnaire and interview schedule.

Questionnaire. The questionnaire was created with the help of the supervisor and included questions addressing a range of issues encountered by secondary school mathematics teachers. These issues covered areas such as student interest and participation, instructional methods and materials, students' mathematical backgrounds, school administration, and teacher training programs. Additionally, respondents were invited to provide information on any other problems they faced that were not covered in the questionnaire.

Interview schedule. The interview schedule was used to gather further information about the problems faced by mathematics teachers. Open-ended questions were asked with the assistance of interview guidelines developed with the help of the

supervisor. Additionally, as a secondary-level mathematics teacher myself, I incorporated my own experiences and challenges related to teaching mathematics at the secondary level into this study.

Reliability and Validity of the Tools

The reliability of the tools referred to their consistency, while validity addressed their appropriateness. Although reliability was essential, it was not sufficient on its own to guarantee validity. Both reliability and validity were crucial qualities for the research instruments. To ensure the questionnaire's reliability, it was piloted with five secondary-level mathematics teachers in Nilakantha Municipality. Before finalizing the instruments, the researcher, with the guidance of the supervisor, ensured the questionnaire's validity. The expert judgement method was applied to ensure the validity of the tools.

Table 3.1: *Cronbach's Alpha*

Variables	No. of items	Cronbach's Alpha
Challenges associated with students background characteristics	6	.758
Issues concerning teacher's training	7	.823
Problem related to students interest and participation	6	.706
Challenges associated with instructional method and materials	10	.849
Challenges related with school administrations	6	.751

Cronbach's Alpha was calculated to assess the reliability of the data. If the Cronbach's Alpha value is above 0.7, the questionnaire is considered reliable. In this

study, the results indicated that the questionnaire was reliable, as each Cronbach's Alpha value exceeded 0.7. The results of the reliability test are presented in Table 3.1

Data Collection Procedure

For data collection, the researcher visited each of the sample schools along with the questionnaire, interview schedule, and a requested letter from T.U. to provide any necessary assistance from the school administration. After explaining the purpose of the visit, the researcher requested the teachers to fill out the questionnaire. Any confusion arising in understanding the statements was explained and clarified by the researcher. After collecting the questionnaires, the researcher categorized the information in tabular form. Furthermore, the researcher thanked the teachers and principals of the schools. Interviews were conducted with selected sample teachers of the schools using interview guidelines. Additionally, the researcher incorporated her own experiences regarding the problems faced by mathematics teachers in teaching mathematics at the secondary level.

Scoring Procedure. For the analysis of items, weights of 1, 2, 3, 4, and 5 were assigned to statements, corresponding to "strongly disagree, disagree, undecided, agree, strongly agree" respectively. If a statement opposed the viewpoint, the value of the items were taken in the opposite order. Weighted mean was calculated for each statement. If the calculated index was greater than three, it was concluded that the statement indicated problems. If the index measure was less than or equal to three, it suggested weak favor towards the problems.

Data Analysis Procedure

The collected data were analyzed and interpreted using both quantitative and qualitative methods. Five-point Likert scale used as a statistical tool for the analysis of

questionnaires. Weighted mean was used to find whether a statement was problematic or not, and qualitative themes were interpreted in a more descriptive way based on quantitative results. The obtained data were analyzed and interpreted with the help of the following statistical technique: Weighted mean was used to locate the central position of the responses to the statements of teachers as a whole on the rating scale. Each statement was studied in terms of whether the teacher problems were up to the index or not. If the calculated weighted mean was greater than three, then it concluded that the statement indicated problems and strongly favored it. If the weighted mean was less than or equal to three, then it was less favorable to the problems.

Next, the data collected from interview schedules were used in the form of direct quotes followed by their brief interpretation. Interaction with the respondents was categorized according to their category, and then different themes were given in the text of the interview. Data triangulation was the way of interpreting information from different tools. The data obtained from both tools were triangulated.

Ethical Consideration

Ethical considerations were specified as one of the most important parts of the research. Ethics were an accumulation of values and principles that addressed questions of what is good or bad in human affairs. Ethical considerations were addressed at individual and societal levels, and the way that individuals were affected by ethical considerations was taken into account. According to the American Educational Research Association, the following ethical considerations were considered in the research:

-) All information of the respondents was given.
-) Permission was taken from parents whose children were studying in school.

-) All information related to participants was shared in the research.
-) In the study, participants were given the chance to voice their desires.
-) Personal information was not taken for personal benefit.
-) All information was securely kept to ensure participants' desires were respected.

Chapter IV

Analysis and Interpretation of Data

The data for the study were collected from forty secondary level mathematics teachers in the Dhading district. The collected data were tabulated and analyzed according to the study's objectives. Statistical analysis and interpretation were conducted using the weighted mean as the primary statistical tool. Additionally, data obtained from interview schedules were analyzed descriptively. The analysis was itemized to address various problems related to teachers who teach mathematics at the secondary level.

The collected data were categorized into five distinct groups for analysis and discussion: student background characteristics, teacher training, student interest and participation, instructional methods and materials, and school administration. Issues related to student background characteristics included disparities in socioeconomic status and educational upbringing impacting learning outcomes. Concerns regarding teacher training focused on the adequacy of preparation for diverse student needs and integration of modern teaching methodologies. Challenges in student interest and participation encompassed motivation and engagement in both academic and extracurricular activities. Discussions on instructional methods and materials centered on the effectiveness and accessibility of resources and pedagogical approaches. School administration concerns included resource allocation and policy implementation to foster a supportive learning environment. These topics collectively shed light on comprehensive educational challenges and the need for targeted strategies to enhance educational outcomes.

Challenges Associated with Students' Background Characteristics

Students remain body of teaching learning process. It is generally agreed that student's ability is dissimilar ability in learning mathematics due to various background such as age, intelligence, gender, maturity, socio-economic status. Poor motivation and failure to provide clear insights into the meaning and methods of the subject to student in mathematics learning is main problem for the teachers. Problem related to student's background characteristics have been categorized into six items to identify the response of teachers. These six question and their weighted mean are given below: -

Table:4.3 Challenges associated with students' background characteristics

S.N.	Statement	Weighted mean
1.	Addressing individual student needs effectively is hindered by time limitations.	3.24
2.	Teaching is impacted by students' insufficient foundational knowledge.	3.325
3.	Balancing engagement between students of diverse academic backgrounds is challenging.	3.6
4.	Evaluating students in heterogeneous classrooms poses difficulties.	2.523
5.	Teaching mathematics is challenging due to varying ages, individual differences, and intelligence levels among students.	3.628
6	Achieving equal participation from both male and female students in the teaching and learning process is problematic.	2.66

The table below outlines the challenges associated with students' background characteristics as perceived by secondary level mathematics teachers. Each challenge is rated using a weighted mean, reflecting the severity of the issue based on the teachers' responses.

Addressing Individual Student Needs. With a weighted mean of 3.24, teachers find it challenging to meet individual student needs due to time constraints. This indicates a significant barrier in providing personalized attention in the classroom.

Insufficient Foundational Knowledge. The weighted mean of 3.325 reflects that students' lack of basic knowledge greatly impacts teaching effectiveness. Teachers struggle to build on weak foundational skills, hindering overall progress in mathematics learning.

Balancing Engagement. The highest weighted mean of 3.6 highlights that engaging students with diverse academic backgrounds is a major challenge. This suggests that teachers face considerable difficulty in ensuring that all students remain actively involved, regardless of their prior knowledge or learning capabilities.

Evaluating Students in Heterogeneous Classrooms. With a weighted mean of 2.523, the difficulties in evaluating students in diverse classrooms are somewhat less pronounced but still notable. This reflects the complexity of assessing a wide range of abilities fairly and accurately.

Teaching Mathematics with Varied Student Differences. The weighted mean of 3.628 indicates that teaching mathematics is particularly challenging due to differences in age, individual characteristics, and intelligence levels among students. This is one of the most significant issues highlighted by the data.

Equal Participation of Male and Female Students. Achieving equal participation from both male and female students has a weighted mean of 2.66, showing that while it is an issue, it is relatively less challenging compared to other factors. However, it still presents a notable concern for teachers striving for gender equity in the classroom.

In summary, the table reveals that the most pressing challenges for mathematics teachers are balancing engagement among students with diverse backgrounds and teaching students with varying individual differences and intelligence levels. Time limitations, insufficient foundational knowledge, and evaluating students in heterogeneous classrooms also pose significant difficulties, while achieving gender equity in participation is a relatively lesser, but still important, challenge.

The challenges faced by secondary-level mathematics teachers, as outlined in the data, can be understood through the lens of Constructivist Learning Theory (Vygotsky, 1978), which emphasizes that learning is an active, individualized process built on prior knowledge. Teachers struggle with insufficient foundational knowledge (weighted mean 3.325) because students come with varied experiences, making it difficult to scaffold new concepts effectively. The high weighted mean for balancing engagement (3.6) and teaching with varied student differences (3.628) reflects Vygotsky's notion of the Zone of Proximal Development (ZPD), where students' diverse abilities demand tailored support to progress. Additionally, time limitations hinder teachers' ability to provide the necessary scaffolding for each student, further complicating the use of differentiated instructional approaches. These findings highlight how challenges related to background characteristics can impede the

effectiveness of constructivist and differentiated teaching approaches, where the focus is on catering to each learner's developmental stage and individual needs.

After summarizing the questionnaire, the researcher discovered that all teachers were encountering the issues mentioned in the statements. Additionally, some problems were particularly prevalent among all teachers. To gain detailed insights into these significant issues, the researcher conducted an in-depth study using interviews. These interviews aimed to gather teachers' opinions on the problems. The teachers' opinions on the issues and related problems aligned with the researcher's initial hypotheses. Regarding students' background characteristics, teachers stated:

"There are students from diverse backgrounds in a single classroom, making it challenging for teachers to address each student's individual needs. Students are central to the teaching and learning process, but many have weak foundational knowledge, which hinders their ability to learn mathematics at the secondary level. With varying abilities present in the same class, not all students participate equally in mathematics lessons. Differences in age, individual characteristics, and intelligence also impact students' academic achievement."

Thus, students are the central focus of teaching and learning activities aimed at gaining knowledge. If students have a weak foundation at the basic level, it negatively impacts their ability to learn mathematics at the secondary level. With students of varying abilities in the same class, not all participate equally in mathematics instruction. Additionally, individual differences, as well as variations in age and intelligence, affect students' academic achievement.

For the solution of above-mentioned problem related to student background characteristics teachers are responded as: -

"Teachers should employ various techniques such as group work, individual tests, and unit tests. To facilitate these activities, the administration should provide extra classes where teachers can utilize different skills and strategies to meet the learners' needs."

Social constructivism posits that learning is an active process of creating meaning from various experiences. Students learn most effectively by making sense of things on their own, with the teacher acting as a guide along the way. According to constructivism, learners construct knowledge through their interactions with the environment. Students are seen as builders of knowledge rather than mere recipients of information provided by the teacher. In this process, a student's background influences their knowledge construction. Thus, people develop their understanding and knowledge of the world through experiences and reflections on their background characteristics. Based on this theory, the researcher concluded that student experiences and background characteristics are crucial in learning mathematics.

From the teachers' responses, interviews, and the theoretical framework, the researcher concluded that students should be treated individually due to their diverse background characteristics. Teachers need to address each student's learning needs by understanding their backgrounds. Additionally, teachers should employ various skills and abilities to meet learners' needs effectively. To teach students from different backgrounds, teachers should divide them into groups and address each group's specific needs.

Issues Concerning Teacher Training

In the sampled schools, all the teachers have a background in mathematics. Among the 40 teachers, 38 hold a bachelor's degree in mathematics education, indicating that they are trained and experienced in the teaching process. However,

many experienced and trained teachers are not applying the skills and knowledge acquired during training in their classroom teaching or in developing local materials. Applying training skills in real classroom situations is a crucial aspect of effective teaching. Without transferring these skills, teaching and learning activities become traditional and monotonous. To understand the issues related to teacher training, the researcher posed seven questions and aims to elaborate on the following aspects in detail.

Table:2 Problem related to teacher training

S.N.	Statements	Weighted mean
1.	Training lacks alignment with teachers' specific needs and demands, often serving as a formality for upgrading purposes.	3.8
2.	I have attended several seminars on mathematics.	3.64
3.	Trainers demonstrate considerable experience and skill in utilizing ICT for training delivery.	3.4
4.	There is a scarcity of refresher training sessions.	4.24
5.	Some trainers are insufficiently knowledgeable about the content they deliver.	2.764
6.	Our school lacks a structured training schedule to enhance teaching and learning activities.	3.5
7.	There is inadequate availability of materials to effectively apply trained knowledge in classroom activities.	4.2

The table above presents the issues related to teacher training as identified by secondary level mathematics teachers. Each issue is rated using a weighted mean, reflecting the extent to which teachers perceive these problems.

Training Alignment with Teachers' Needs. With a weighted mean of 3.8, it is evident that training programs often do not align with the specific needs and demands of teachers. Many view these programs as mere formalities for upgrading qualifications rather than addressing real classroom challenges.

Attendance at Seminars. Teachers frequently attend seminars on mathematics, reflected by a weighted mean of 3.64. This indicates a high level of engagement in professional development opportunities.

Experience and Skill of Trainers. Trainers are considered to have considerable experience and skill, particularly in using ICT for training delivery, with a weighted mean of 3.4. This suggests that the quality of training delivery is relatively strong in this area.

Scarcity of Refresher Training Sessions. The highest weighted mean of 4.24 points to a significant scarcity of refresher training sessions. Teachers feel the need for ongoing professional development to keep their skills and knowledge current.

Content Knowledge of Trainers. Some trainers are perceived as lacking sufficient content knowledge, with a weighted mean of 2.764. This indicates a need for better-qualified trainers who are well-versed in the subject matter they teach.

Lack of Structured Training Schedule. A weighted mean of 3.5 reflects the absence of a structured training schedule in schools, which is crucial for enhancing teaching and learning activities.

Inadequate Availability of Materials. The weighted mean of 4.2 highlights the significant issue of insufficient materials to apply trained knowledge effectively in classroom activities. This lack of resources hinders the practical application of skills acquired during training.

In summary, the most pressing issues in teacher training include the scarcity of refresher sessions, inadequate materials for applying trained knowledge, and training programs not tailored to teachers' specific needs. While trainers are skilled in ICT, there is a need for more qualified trainers with strong content knowledge and a structured training schedule to support continuous professional development.

From Vygotsky's Social Development Theory, the misalignment of training programs with teachers' real classroom challenges (weighted mean 3.8) suggests that these programs do not effectively target teachers' Zone of Proximal Development (ZPD), where learning is most impactful when supported just beyond one's current ability. The scarcity of refresher training sessions (4.24) and insufficient materials (4.2) further hinder teachers from applying new skills, as Vygotsky emphasized the importance of tools and resources for learning. Additionally, the perception that some trainers lack content knowledge (2.764) highlights the need for knowledgeable mentors who can scaffold teachers effectively, enabling them to grow professionally. Conversely, skilled trainers in ICT use (3.4) reflect the importance of having experts guide teachers through their ZPD, facilitating meaningful learning and skill development.

After summarizing the questionnaire, the researcher found that all teachers were encountering the issues mentioned in the above statements. Additionally, some problems were particularly significant and were widely experienced by all teachers.

To gain detailed insights into these strongly faced issues, the researcher conducted in-depth interviews. These interviews aimed to gather teachers' opinions on the problems. The teachers' perspectives on the issues related to teacher training aligned with the researcher's initial hypotheses. Specifically, regarding teacher training problems, teachers expressed the following views:

"There is a lack of adequate materials in schools to facilitate the application of knowledge gained from training. Teacher training programs do not cater to the specific needs and requests of teachers; instead, they are perceived as formalities. Additionally, there is a noticeable absence of refresher training sessions aimed at teaching challenging and rigorous topics within schools. Furthermore, supervisors and resource persons seldom provide valuable or constructive feedback to teachers."

Therefore, there are fewer mathematics teacher training sessions and seminars conducted, with most of these being perceived as formalities. Supervisors provide directive feedback rather than positive reinforcement. The lack of adequate teaching materials for applying trained knowledge in classroom activities poses a significant challenge for mathematics teachers. In response to these issues related to teacher training, teachers have expressed the following viewpoints:

"The school administration ought to supply essential equipment for both teachers and students. It should also organize refresher training sessions to effectively teach challenging topics and to utilize teaching materials proficiently. Supervisors and resource persons should offer positive feedback and constructive suggestions to teachers."

According to constructivist theory, teachers act as facilitators or guides, requiring diverse abilities and capacities to meet the needs of learners. Thus, training

is crucial for their professional development. McLeod (2013) asserts that in constructivism, teachers scaffold learning, and the Zone of Proximal Development (ZPD) is central to learning. Teachers play a pivotal role in guiding students to expand their ZPD. In a constructivist classroom, instruction is active, student-centered, and inquiry-based. Therefore, teachers require ongoing refresher training and seminars to stay updated on new teaching methods and techniques.

Based on teachers' responses, interviews, and the principles of constructivist theory, the researcher concluded that teaching is a skilled profession, necessitating diverse capacities to meet learners' needs effectively. However, experienced teachers who have undergone training often do not apply their skills and knowledge due to the lack of adequate materials for using trained knowledge in classroom activities. It is imperative for school administrations to provide necessary materials for teachers. Additionally, regular refresher training and seminars are essential. Training programs should focus on addressing teachers' specific needs and demands rather than being seen as mere formalities for career advancement.

Problem Related to Student Interest and Participation

Students are central to the teaching and learning process, and their interest is crucial for acquiring knowledge. Active participation in classroom activities enhances meaningful learning experiences. Through participation, students grasp mathematical concepts effectively. Many students perceive mathematics as challenging and dull, leading to a lack of interest in learning the subject. This poses a significant challenge for mathematics teachers. The issues related to students' interest and participation have been categorized into six items to gauge teachers' responses. Below are the questions and their respective weightages.

Table:3Problemrelatedtostudentinterestandparticipation

S.D	Statements	Weighted mean
1.	Mathematics is perceived as a challenging subject by students.	3.4
2.	Students lack interest in learning mathematics due to their inadequate background.	3.2
3.	Students actively participate in classroom activities.	3.6
4.	Students demonstrate diligence in their studies.	3.24
5.	Students often feel bored while learning mathematics.	3.25
6.	Many students lack basic knowledge of mathematics.	3.876

The table above summarizes the issues related to student interest and participation in mathematics as perceived by teachers. Each statement is accompanied by its weighted mean, which indicates the level of concern or observation among teachers regarding these issues.

Perception of Mathematics as Challenging. Teachers acknowledge that students perceive mathematics as a challenging subject, with a weighted mean of 3.4. This perception can affect students' motivation and engagement in learning mathematics.

Lack of Interest Due to Background. Students' insufficient background in mathematics is highlighted, receiving a weighted mean of 3.2. This suggests that students' lack of foundational knowledge poses a barrier to their interest in the subject.

Active Participation in Classroom Activities. Teachers observe that students actively participate in classroom activities, with a weighted mean of 3.6. This indicates a positive level of engagement from students during mathematics lessons.

Demonstration of Diligence. Students are noted for their diligence in studies, as indicated by a weighted mean of 3.24. This reflects students' commitment to their academic responsibilities.

Boredom While Learning Mathematics. Many students experience boredom during mathematics lessons, with a weighted mean of 3.25. This highlights a challenge in maintaining student engagement and interest throughout the lesson.

Lack of Basic Knowledge. The highest weighted mean of 3.876 underscores that many students lack fundamental knowledge of mathematics. This lack of foundational understanding poses a significant obstacle to their learning progress and achievement in the subject.

In summary, while students actively participate and demonstrate diligence in their studies, they often perceive mathematics as challenging and experience boredom during lessons. Addressing students' inadequate background knowledge is crucial to fostering greater interest and success in learning mathematics. Vygotsky emphasizes that learning occurs most effectively within a student's Zone of Proximal Development (ZPD), where appropriate guidance is crucial for overcoming difficulties in complex subjects like mathematics. The lack of foundational knowledge (3.2) limits students' ability to engage fully, aligning with Vygotsky's idea that prior knowledge is essential for new learning. While students show active participation (3.6) and diligence (3.24), their boredom during lessons (3.25) suggests that instructional methods may not be fully addressing their ZPD, making it harder to

sustain engagement. Providing targeted support and resources could help mitigate these challenges and enhance student motivation and success in mathematics.

Apart from these issues, certain challenges were consistently experienced by all teachers. To delve deeper into these commonly faced problems, the researcher conducted detailed interviews. These interviews aimed to gather teachers' opinions on these issues. The teachers' views on the aforementioned statements and related problems aligned closely with the researcher's initial hypotheses. Specifically, regarding the problem of student interest and participation, teachers expressed the following perspectives:

"Student engagement in classroom activities is crucial for academic success. In mathematics education, students learn best through active participation and hands-on experience. However, if students are disengaged and lack interest in learning mathematics, compounded by a deficiency in basic mathematical knowledge, they may struggle to comprehend advanced mathematical concepts later on due to their inadequate foundation."

The primary reason for low achievement in mathematics is the lack of student interest in learning the subject. Many students neglect practicing mathematics exercises outside of homework assignments. Active student participation is essential for meaningful learning, yet in mathematics classes, students often exhibit passivity, posing a significant challenge for teachers. In response to these issues related to student interest and participation, teachers emphasized the following solutions:

"Students are central to learning activities, thus they should actively engage in classroom activities and practice mathematical problems both at home and in school. Teachers should employ student-centered methods that encourage active

participation. To facilitate this, school administrations should foster a conducive learning environment."

The vygotsky (1978)emphasizes the active participation of students in learning activities, with the teacher acting as a facilitator or guide. In our classrooms, traditional teaching methods often lead to passive learning among students, where teachers solve every problem, resulting in less effective learning experiences. According to this theory, learning is an active process where students create meaning from their experiences. Piaget's theory suggests that knowledge is not simply received passively but is actively constructed by students. Students generate mathematical ideas rather than accepting them as given. They are builders of knowledge who create understanding based on their interests through active participation.

Based on teachers' responses, interviews, and the principles of constructivist theory, the researcher concluded that meaningful learning occurs when students actively participate in teaching activities. Conversely, classrooms become dull when students are not engaged. Therefore, it is essential for students to be active participants in class. One reason for students' lack of engagement is the use of traditional teaching methods by teachers. To enhance student participation, teachers should adopt student-centered approaches that encourage active involvement. Many students perceive mathematics as challenging and lack interest in learning it. To address this, teachers should employ various strategies such as group work and unit tests to make mathematics more engaging. Ultimately, teaching should be tailored to students' interests and needs to foster a positive learning environment.

Challenges Associated with Instructional Methods and Materials

Teaching methods and materials play a crucial role in facilitating effective teaching and learning. Teachers serve as the primary agents responsible for implementing instructional strategies, and the success of the teaching process largely depends on them. Both teachers and students play essential roles in utilizing instructional materials during classroom activities. The choice of teaching methods should be guided by considerations of knowledge acquisition, understanding, and skill application. Additionally, teachers should prioritize addressing the needs, interests, and preferences of their students.

To gain insight into the challenges related to instructional methods and materials in mathematics, the researcher formulated ten questions. These questions aimed to explore and provide a detailed understanding of the issues concerning the methods and materials used in mathematical instruction.

Table:3 Problem related to teaching methods and materials

S.N.	Statements	Weighted mean
1.	Insufficient teaching materials are available.	3.6
2.	Classroom space is inadequate for demonstrating instructional materials effectively.	2.8
3.	There is limited financial support from the administration for purchasing and constructing instructional materials.	3.7
4.	There is a shortage of time for the construction and use	3.6

	of materials.	
5.	Textbooks and practice books are not provided on time.	2.8
6.	Difficulties arise in completing the entire course when relying on teaching materials.	2.7
7.	The school lacks a dedicated mathematics lab.	3.65
8.	There are no provisions for constructing or purchasing necessary materials.	3.555
9.	There is uncertainty regarding which methods to use due to varying levels of knowledge among teachers.	2.628
10.	Some units are particularly challenging to teach.	2.6

The table above outlines the specific challenges related to teaching methods and materials in mathematics education, as identified by teachers. Each statement is accompanied by its weighted mean, which indicates the level of concern or difficulty perceived by teachers regarding these issues.

Insufficient Teaching Materials. Teachers express concern over the inadequacy of teaching materials, reflected in a weighted mean of 3.6. This shortage hampers effective instructional delivery.

Inadequate Classroom Space. The classroom space available is deemed insufficient for demonstrating instructional materials effectively, with a weighted mean of 2.8, posing a practical challenge.

Limited Financial Support. A significant weighted mean of 3.7 indicates that there is limited financial support from the administration for purchasing and constructing instructional materials, affecting resource availability.

Shortage of Time. There is a perceived shortage of time (weighted mean of 3.6) for both constructing and utilizing teaching materials effectively within the curriculum.

Delayed Provision of Textbooks. Textbooks and practice books are not provided on time, as indicated by a weighted mean of 2.8, impacting lesson planning and continuity.

Challenges in Completing the Course. Difficulties arise in completing the entire course when relying on teaching materials, with a weighted mean of 2.7, affecting instructional progress.

Lack of Mathematics Lab. The absence of a dedicated mathematics lab is noted as a concern (weighted mean of 3.65), limiting hands-on learning experiences.

Provisions for Materials. There are no provisions in place for constructing or purchasing necessary materials, receiving a weighted mean of 3.555, highlighting logistical challenges.

Uncertainty in Method Selection. Teachers face uncertainty (weighted mean of 2.628) regarding which teaching methods to employ due to varying levels of knowledge among colleagues.

Challenging Teaching Units. Some units within the curriculum are particularly challenging to teach, with a weighted mean of 2.6, necessitating specialized instructional approaches.

In summary, the table illustrates various challenges related to teaching methods and materials in mathematics education. These include resource shortages, logistical constraints, and uncertainties in instructional planning, which collectively impact the quality and effectiveness of mathematics instruction. Addressing these challenges is crucial for enhancing teaching practices and improving student learning outcomes. Vygotsky emphasized the role of a structured learning environment, and the insufficient classroom space (2.8) and absence of a mathematics lab (3.65) limit opportunities for hands-on, interactive learning, which are critical for developing deeper understanding. Uncertainty in method selection (2.628) and the challenges in completing the course (2.7) reflect the difficulty in aligning teaching methods with student needs when resources and guidance are lacking. These constraints highlight the necessity of addressing material and logistical challenges to ensure that teachers can effectively implement methods that align with Vygotsky's emphasis on guided learning and resource-rich environments for optimal student development.

After reviewing the questionnaire results, it was clear that all teachers encountered the challenges outlined in the statements above. Furthermore, certain issues were particularly pronounced among all teachers. To delve deeper into these widely experienced challenges, the researcher conducted detailed interviews. These interviews aimed to gather teachers' opinions on the issues. The teachers' feedback closely mirrored the researcher's initial hypotheses regarding instructional methods and materials. Specifically, teachers expressed similar concerns regarding these challenges:

“There is a shortage of mathematical teaching aids. The school's economic challenges prevent the administration from acquiring additional mathematical materials. Existing materials are not adequately protected or maintained; they are

haphazardly stored in the office and are not repaired when damaged. Moreover, due to time constraints, there is insufficient opportunity to construct and effectively utilize teaching materials”.

There is an insufficiency of teaching materials at the school, with no provisions for acquiring or constructing necessary resources. Additionally, there is no dedicated math lab room available. The head teacher and school administration are perceived as lacking responsibility in managing essential teaching materials. Furthermore, teachers feel they lack adequate knowledge to effectively utilize the available materials. To address these challenges related to teaching methods and materials, teachers responded with the following recommendations:

" The school administration needs to oversee the maintenance of essential equipment, while teachers should ensure proper utilization of available materials. Both teachers and the school administration should take responsibility for safeguarding these materials. Furthermore, training should be conducted for teachers to enhance their proficiency in utilizing these resources effectively."

Matthews (2011) emphasized that in a constructivist classroom, the focus shifts from teacher-led instruction to collaborative learning among students, where knowledge is acquired through peer interaction. Constructivist teaching posits that learning occurs when learners actively engage in constructing meaning and knowledge, rather than passively receiving information.

Based on feedback from teachers, interviews, and the constructivist theory, the researcher concluded that challenges include inadequate materials, insufficient knowledge to effectively utilize teaching aids for specific topics, and difficulty in selecting appropriate teaching methods for different content areas. Furthermore, the

lack of adequate training sessions exacerbates the problem of using materials effectively for teaching. It is recommended that the school administration take responsibility for managing necessary equipment, and both teachers and administrators should ensure the proper use and protection of materials. Additionally, teachers need comprehensive training on how to use these materials effectively in their teaching practices.

Challenges Pertaining to School Administration

School administration is a crucial component of the educational environment, pivotal in creating a conducive school atmosphere. However, if the administration is perceived as inactive or neglectful, it can significantly impact the teaching and learning processes, thereby affecting student achievement directly. Hence, effective school administration is essential to address teachers' concerns and support their efforts in the classroom.

To explore the issues pertaining to school administration, the researcher formulated six questions. The responses to these questions were analyzed and summarized based on their average importance or significance.

Table:5 Problem related to school administration

S.D.	Statements	Weighted mean
1.	The school administration shows limited responsibility in providing necessary equipment for teachers and students.	3.8
2.	There is a lack of facilities and rewards for good	3.2

	performance.	
3.	Teachers are compelled to take on additional classes due to a shortage of mathematics teachers.	2.9
4.	There is insufficient refresher training available to teach difficult and rigorous topics.	4.5
5.	The school has library facilities.	3.2
6.	There is a lack of teacher involvement in curriculum planning.	3.5

Here's an explanation of Table 5, which outlines problems related to school administration as perceived by teachers:

Limited Responsibility in Providing Equipment. Teachers feel that the school administration shows limited responsibility in providing necessary equipment for teachers and students, with a weighted mean of 3.8. This suggests concerns over resource allocation and support.

Lack of Facilities and Rewards for Performance. There is a perceived lack of facilities and rewards for good performance, scoring a weighted mean of 3.2. This reflects dissatisfaction regarding recognition and incentives for teachers' efforts.

Compulsion to Take Additional Classes. Teachers are compelled to take on additional classes due to a shortage of mathematics teachers, with a weighted mean of 2.9. This highlights staffing challenges specifically in the field of mathematics education.

Insufficient Refresher Training. There is a significant concern about insufficient refresher training available to teach difficult and rigorous topics, registering a high weighted mean of 4.5. This emphasizes the critical need for ongoing professional development.

Library Facilities Available. The school provides library facilities, which receives a weighted mean of 3.2, indicating satisfactory availability of this educational resource.

Lack of Teacher Involvement in Curriculum Planning. There is a perceived lack of teacher involvement in curriculum planning, scoring a weighted mean of 3.5. This points to a need for greater collaboration and input from teachers in shaping educational strategies.

These findings underscore key areas where improvements in school administration could potentially enhance teaching quality and support student achievement. Addressing these challenges is crucial for creating a conducive learning environment and optimizing educational outcomes in mathematics education.

After reviewing the questionnaire, it became evident that all teachers encountered challenges related to the issues mentioned above. Additionally, certain problems were particularly prominent among all teachers. To gain deeper insights into these commonly faced issues, the researcher conducted in-depth interviews with teachers. During these interviews, teachers' opinions on the aforementioned problems and related issues closely aligned with the researcher's hypotheses. Specifically, regarding concerns about school administration, teachers emphasized consistent themes.

"In our school, there is a shortage of teaching materials and basic necessities such as library resources. Teachers feel unprepared to utilize local resources as teaching materials due to inadequate support from the administration. Occasionally, negative political influences within the administration affect teachers' morale. Furthermore, the school administration does not organize refresher training sessions to handle challenging and rigorous topics effectively. Additionally, there is a lack of facilities and recognition for rewarding teachers' good performance."

Therefore, the school administration plays a direct role in influencing student achievement. It is crucial for the administration to take responsibility in addressing teachers' concerns. Insufficient materials, lack of administrative support, absence of refresher training for teachers, and negative impacts of political influences are contributing factors to unsatisfactory educational outcomes. Additionally, rewarding teachers for good performance could provide positive reinforcement. Teachers emphasized the need for these issues related to school administration to be resolved.

"The school administration ought to take responsibility for teachers, students, and parents. Acknowledging and rewarding teachers for outstanding performance is essential. Conducting short-term refresher training sessions for teachers to handle challenging topics positively impacts the learning environment."

According to Vygotsky (1978), learners construct their knowledge through interactions with their environment. The school administration bears responsibility for creating a positive school environment that benefits students, teachers, parents, and society. In the context of social constructivism, society plays a crucial role in learning, and the administration's provision of adequate physical resources and instructional materials is pivotal. A weak and irresponsible administration can lead to a

deteriorating learning environment and hinder academic outcomes. Language, culture, and societal factors significantly influence student learning according to this theory, underscoring the importance of the administration's role in shaping a conducive learning environment.

Based on teacher responses, interviews, and the theoretical framework, the researcher concluded that the school administration should prioritize responsibilities towards teachers, students, and parents alike. Recognizing and rewarding teachers for exemplary performance is crucial. Additionally, organizing short-term refresher training sessions for teachers to effectively teach challenging topics positively impacts the overall learning environment.

Chapter V

Findings, Conclusion and Recommendations

This chapter deals with the findings, conclusion and recommendations. The first section reveals the major findings of the study. After the analysis and interpretation of collected data, in this chapter an attempt had been made to derive important conclusion in second section. I have presented some recommendation at the end.

Findings

Based on the field survey and statistical analysis of gathered data, several challenges faced by secondary-level mathematics teachers have been identified. Here are the main findings from this study:

-) Individual differences in age and intelligence among students impact their academic achievements.
-) There is a shortage of sufficient mathematical teaching materials within schools.
-) Lack of proper storage facilities, such as a dedicated mathematics lab, leads to inadequate protection of available materials.
-) Schools lack provisions and face economic constraints in acquiring necessary teaching materials.
-) Teachers struggle with selecting appropriate teaching methods for specific topics, often resorting to traditional, teacher-centered approaches.
-) The school administration is negligent in providing essential equipment for both teachers and students, including a dedicated mathematics lab.
-) Students' inadequate foundational understanding of mathematics poses a significant teaching challenge.

-) Students come from diverse social, cultural, economic, and family backgrounds.
-) Inadequate refreshment training is provided to teachers, particularly in teaching challenging topics effectively and in an engaging manner.
-) There is a lack of facilities and incentives to reward teachers for their exemplary performance.
-) Training sessions for teachers often focus more on content rather than practical teaching techniques, and they are not tailored to teachers' specific needs.
-) Despite receiving training, many teachers fail to apply their acquired skills and knowledge effectively in the classroom due to insufficient materials.
-) Students generally perceive mathematics as a difficult and boring subject, resulting in low engagement both in class and during self-study.
-) Students' weak foundational knowledge from earlier grades contributes to their ongoing disinterest in learning mathematics.
-) Students demonstrate a lack of diligence and active participation in classroom activities, further hindering effective learning.
-) To address student needs, schools should consider organizing additional mathematics classes and grouping students based on their capabilities.
-) It is essential to conduct regular refreshment training sessions to update teachers on modern teaching techniques and effective use of materials.
-) The school administration must ensure adequate provision and maintenance of necessary equipment, including materials for the mathematics lab.
-) Recognizing and rewarding teachers for their outstanding performance is crucial for improving overall teaching quality.

-) Teachers should foster a deeper understanding of students' psychology and actively encourage student participation in mathematics classes.

Conclusions

Based on the findings of this study, it is evident that the quality of mathematics education in Nilkantha municipality, Dhading is unsatisfactory, largely due to numerous challenges faced by teachers. These challenges stem from students' diverse backgrounds, insufficient teacher training, limitations in instructional methods and materials, ineffective school administration, and students' lack of engagement. Teachers struggle to address the individual needs of students because of their varying backgrounds and characteristics. Furthermore, despite receiving training, many teachers do not apply their acquired skills and knowledge due to the inadequate availability of teaching materials in schools. The school administration also demonstrates insufficient responsibility in managing these materials.

Key issues include students' weak foundational understanding of mathematics, inadequate refreshment training for teachers, student disinterest in learning mathematics, low classroom participation, lack of essential materials, absence of constructive feedback from supervisors, and the absence of a mathematics lab. To address these challenges, regular refreshment training should be conducted, and the school administration must take proactive steps to manage necessary equipment for both teachers and students. Teachers should be encouraged to utilize available materials effectively, and additional mathematics classes should be organized. It is essential for teachers to understand each student's background and tailor their approach accordingly, while the school administration should implement mechanisms to recognize and reward exemplary teacher performance.

Recommendations

Major recommendations for improving teaching and learning in mathematics based on findings are as follows.

-) Teachers should assess students' interests and needs based on their psychological profiles and tailor suitable pedagogical approaches accordingly for teaching Mathematics effectively.
-) Regular seminars, refreshment training sessions, orientations, and supervision should be provided to teachers to enhance their teaching skills and keep them updated with modern educational practices.
-) Utilization of appropriate teaching aids is crucial in Mathematics education to facilitate better understanding. Teachers should encourage active participation of students in classroom activities to promote engagement and learning.
-) Mathematics teachers should employ suitable teaching methods and materials that are engaging and motivational for students, thereby fostering their interest in Mathematics.
-) School administrations need to take responsibility for managing necessary equipment and creating a conducive learning environment within schools.
-) It is essential for school administrations to establish an educational environment that supports both academic and personal development. Teachers should strive to create a Mathematical environment that extends beyond the classroom.
-) Recognizing and rewarding exemplary teacher performance can serve as positive reinforcement and motivation for continuous improvement in teaching practices.

-) Teachers should effectively apply the skills and knowledge acquired through training in their classroom activities to enhance learning outcomes.
-) School administrations should ensure adequate provision and management of materials for both teachers and students to support effective teaching and learning.

Recommendations for Further Study:

-) Future studies could focus on exploring the challenges faced specifically by primary level teachers in Mathematics education.
-) Research could be conducted to investigate the factors influencing students' achievement in Mathematics and the specific problems they encounter.
-) It would be beneficial to conduct similar studies with larger sample sizes across various schools in different regions of Nepal to generalize findings and identify region-specific challenges.

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Appendix I

Questionnaire

Respected teachers,

I am a master's degree student of mathematics education, central department of education, Kirtipur Kathmandu. I am writing a thesis entitled on "Problem Faced by Secondary Level Mathematics Teacher in Teaching Mathematics" For partial fulfillment of master degree in education. Teaching learning activities couldn't be effective without identifying the actual problems of teacher in teaching. So, to complete this thesis, I have prepared some questionnaire for you. Researcher is very much thankful for your valuable help and would like to express gratitude to you and your institution. The information obtained from you is used for this study and your answer is kept secret.

Researcher Name: Sabina Shrestha

Department of Mathematics Education, Kirtipur Kathmandu, Nepal

I request to fill this questionnaire as follows:

Teacher's BioData Form

Name of Teacher:

Sex: Male/Female Age.....

Name of school:

Academic qualification:

Teaching experience:

Section:B

Please give tick marks which you feel in the best option where

S.A=strongly agree, A =Agree, U=Undecided, D=Disagree,S.D=StronglyDisagree.

S.N.	Statements	SA	A	U	D	SD
1.	Addressing individual student needs effectively is hindered by time limitations.					
2.	Teaching is impacted by students' insufficient foundational knowledge.					
3.	Balancing engagement between students of diverse academic backgrounds is challenging.					
4.	Evaluating students in heterogeneous classrooms poses difficulties.					
5.	Teaching mathematics is challenging due to varying ages, individual differences, and intelligence levels among students.					
6.	Achieving equal participation from both male and female students in the teaching and learning process is problematic.					

7.	Training lacks alignment with teachers' specific needs and demands, often serving as a formality for upgrading purposes.					
8.	I have attended several seminars on mathematics.					
9.	Trainers demonstrate considerable experience and skill in utilizing ICT for training delivery.					
10.	There is a scarcity of refresher training sessions.					
11.	Some trainers are insufficiently knowledgeable about the content they deliver.					
12.	Our school lacks a structured training schedule to enhance teaching and learning activities.					
13.	There is inadequate availability of materials to effectively apply trained knowledge in classroom activities.					
14.	Mathematics is perceived as a challenging subject by students.					
15.	Students lack interest in learning mathematics due to their inadequate background.					
16.	Students actively participate in classroom activities.					
17.	Students demonstrate diligence in their studies.					

18	Students often feel bored while learning mathematics.					
19	Many students lack basic knowledge of mathematics.					
20	Insufficient teaching materials are available.					
21.	Classroom space is inadequate for demonstrating instructional materials effectively.					
22.	There is limited financial support from the administration for purchasing and constructing instructional materials.					
23.	There is a shortage of time for the construction and use of materials.					

24.	Textbooks and practice books are not provided on time.					
25.	Difficulties arise in completing the entire course when relying on teaching materials.					
26.	The school lacks a dedicated mathematics lab.					
27.	There are no provisions for constructing or purchasing necessary materials.					
28.	There is uncertainty regarding which methods to use due to varying levels of knowledge among teachers.					
29.	Some units are particularly challenging to teach.					

30.	The school administration shows limited responsibility in providing necessary equipment for teachers and students.					
31.	There is a lack of facilities and rewards for good performance.					
32.	Teachers are compelled to take on additional classes due to a shortage of mathematics teachers.					
33.	There is insufficient refresher training available to teach difficult and rigorous topics.					
34.	The school has library facilities.					
35.	There is a lack of teacher involvement in curriculum planning.					

If you have faced any other problems, then mention below:

a)

b)

c)

Appendix II

GuidelinesfortheinterviewMathematicsTeacher

NameofTeacher:

Sex:Male/Female Age.....

Nameofschool:

Academicqualification:

Teachingexperience:

The interviews with Mathematics teachers were conducted focusing on the following key areas:

-) Engagement of students in classroom activities
-) Methods and materials used in mathematics teaching
-) Administration of schools
-) Causes of these problems and potential solutions
-) Characteristics of students' backgrounds
-) Training of teachers and its application in classroom teaching
-) Refreshment training, seminars, and other mathematical programs
-) Students' interest in learning mathematics